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Editorial: Media-related Educational Competencies of German and US Preservice Teachers

A Comparative Analysis of Competency Models, Measurements and Practices of Advancement

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Abstract

Media have become omnipresent in children's and youths' everyday lives, and they also offer rich chances and challenges for educational contexts. On the one hand, media can, for example, support students' learning effectively, enhance lessons with innovative tools and methods and help individualize teaching and learning processes. On the other hand, students need to learn, e.g., how to use these media, how to select and evaluate them and how to act responsibly in a digitalized and mediatized world. Teachers are a core stakeholder in this context. To take advantage of the benefits media offer for teaching and learning processes, to support students in the acquisition of respective competencies and to fulfill numerous other media-related tasks and challenges, teachers need to acquire respective competencies in their initial teacher education, which can be summarized as media-related educational competencies.

The relevance of these competencies is evident on different levels. In related research, respective competency models are developed, and in practices of teacher education, competencies are measured and efforts are taken to advance the competencies of preservice teachers. Against this background, this semi-cumulative dissertation presents a theory-based and empirical analysis of the competencies in question from a comprehensive and multidimensional perspective. In accordance with the central aspects outlined, the three systematic main fields focused on are models of media-related educational competencies, their measurement and practices of advancement in teacher education, as well as the interplay of these three fields. The dissertation takes on an international comparative perspective and focuses on the examples of initial teacher education in Germany and the USA.

The article-based dissertation comprises three main parts, framed by introduction and conclusion. The introduction provides a basis for the following work with regards to terminology, scope of research and overall methodology. The first main part is concerned with models of media-related educational competencies and includes a theory-based systematic comparison of three relevant models. This part explicates the varieties between competency models, and it discusses central aspects of selection and application. In Part II, methods and varieties of competency measurement are focused on, and an article

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is presented which shares results of an exploratory quantitative measurement of the respective competencies of German and US preservice teachers. Overall, this part reveals the potential and limitations of competency measurement and transfers these conclusions to the competency models introduced in Part I. Part III is concerned with an analysis of current practices of advancing media-related educational competencies in Germany and the USA. In this context, stakeholders influencing these practices will be systemized and analyzed in their role and impact. The article included in Part III introduces interviews which were conducted to achieve insights into the perspectives of selected experts, regarding relevant models, practices and outcomes of media-related teacher education in Germany and the USA.

Finally, the Conclusion of the dissertation will draw together the different strands, clarify the close connection between the domains of modelling, measuring and advancing the competencies in question and discuss the interdependencies of these three dimensions. These perspectives help both to contextualize and bring together important facets which have often been treated separately in related research and will add new facets to ultimately achieve a comprehensive and multifaceted viewpoint.

Against the background of the intercultural comparative perspective, the results and findings will ultimately achieve an enhanced and deep analysis and reflection on the complex field of media-related educational competencies in Germany and the USA and beyond.

Editorial: Die medienbezogenen pädagogischen Kompetenzen deutscher und US-amerikanischer Lehramtsstudierender. Eine vergleichende Analyse von Kompetenzmodellen, Kompetenzmessungen und Praktiken der Kompetenzförderung

Zusammenfassung

Medien sind in den Lebenswelten heutiger Kinder und Jugendlicher allgegenwärtig, und auch für pädagogische Kontexte bieten sie vielfältige Chancen, aber auch Herausforderungen. Einerseits können Medien beispielsweise effektiv die Lernprozesse von Schülerinnen und Schülern unterstützen, Unterricht um innovative Instrumente und Methoden ergänzen und zur Individualisierung von Lehr- und Lernprozessen beitragen. Andererseits müssen Schülerinnen und Schüler beispielsweise lernen, wie sie diese Medien nutzen, wie sie sie auswählen und einschätzen und wie sie in einer digitalisierten Welt verantwortungsvoll handeln. Lehrerinnen und Lehrern kommt dabei eine zentrale Rolle zu. Um die Vorteile, die Medien für Lehr- und Lernprozesse bieten, nutzen zu können, um Schülerinnen und Schüler beim Erwerb entsprechender Fähigkeiten und Kompetenzen unterstützen zu können und um zahlreiche weitere medienbezogene Aufgaben und Herausforderungen bewältigen zu können, müssen Lehrerinnen und Lehrer bereits im Studium entsprechende

Kompetenzen erwerben, die als medienbezogene pädagogische Kompetenzen [media-related educational competencies] bezeichnet werden können.
Die Relevanz dieser Kompetenzen zeigt sich auf verschiedenen Ebenen. In der Wissenschaft werden entsprechende Kompetenzmodelle entwickelt, und in der Praxis der Lehrerbildung werden Kompetenzen gemessen und es werden Anstrengungen unternommen, um die Kompetenzen von Lehramtsstudierenden zu fördern. Vor diesem Hintergrund stellt diese teilkumulative Dissertation eine theoriebasierte und empirische Untersuchung der betroffenen Kompetenzen aus einer umfassenden und vielschichtigen Perspektive vor. In Übereinstimmung mit den skizzierten zentralen Aspekten sind die drei systematischen Kernfelder Modelle medienbezogener pädagogischer Kompetenzen, ihre Messung und Praktiken der Förderung im Lehramtsstudium, sowie das Zusammenspiel dieser drei Felder. Es wird eine international vergleichende Perspektive eingenommen, die beispielhaft die Lehrerbildung in Deutschland und den USA in den Blick nimmt.
Die teilkumulative Dissertation umfasst drei Hauptteile, die durch eine Einleitung und ein Schlusskapitel gerahmt werden. Die Einleitung stellt in Hinblick auf Terminologie, Forschungsabsicht und die grundlegende Methodik eine Grundlage für das folgende Werk dar. Im ersten Hauptteil werden Modelle medienbezogener pädagogischer Kompetenzen behandelt und ein theoriebasierter systematischer Vergleich dreier relevanter Modelle wird vorgestellt. So werden die Unterschiede zwischen Kompetenzmodellen verdeutlicht und zentrale Aspekte der Auswahl und des Einsatzes diskutiert. Im zweiten Teil werden Methoden und unterschiedliche Möglichkeiten der Kompetenzmessung fokussiert, und in einer veröffentlichten Studie werden Ergebnisse einer explorativen quantitativen Messung der entsprechenden Kompetenzen bei deutschen und US-amerikanischen Lehramtsstudierenden vorgestellt. Insgesamt werden in diesem Teil die Möglichkeiten und Einschränkungen der Kompetenzmessung aufgezeigt und auf die Modelle übertragen, die im ersten Teil eingeführt wurden. Im dritten Teil werden gegenwärtige Praktiken der Förderung medienbezogener pädagogischer Kompetenzen in Deutschland und den USA analysiert. In diesem Zusammenhang werden auch Parteien und Interessengruppen, die einen Einfluss auf diese Praktiken ausüben, hinsichtlich ihrer Rolle und ihres Einflusses systematisiert und analysiert. Die veröffentlichte Studie in diesem Teil stellt Experteninterviews vor, deren Ziel es ist, einen Einblick in die Perspektiven ausgewählter Expertinnen und Experten bezüglich relevanter Modelle, Praktiken und Ergebnissen der medienbezogenen Lehramtsausbildung in Deutschland und den USA zu erlangen.
Am Ende werden im Abschlusskapitel die verschiedenen Bereiche zusammengeführt und die enge Verbindung und die gegenseitigen Abhängigkeiten zwischen den Bereichen der Modellierung, der Messung und der Förderung der untersuchten Kompetenzen verdeutlicht und diskutiert. Diese Perspektiven tragen dazu bei, sowohl Dimensionen, die zuvor in der relevanten Forschung oftmals separat behandelt wurden, zu kontextualisieren und zusammenzuführen, als auch neue Facetten hinzuzufügen, um ein umfassendes und mehrperspektivisches Verständnis medienpädagogischer Kompetenzen zu erreichen.

Vor dem Hintergrund einer international vergleichenden Sichtweise werden die Ergebnisse und Erkenntnisse schlussendlich zu einer ausführlichen und tiefgehenden Analyse und Reflexion zum komplexen Themengebiet der medienbezogenen pädagogischen Kompetenz in Deutschland und den USA und darüber hinaus führen.

1. Rationale and Main Objectives of Researching Media-related Educational Competencies

Media have become increasingly relevant and widespread over the last decades and are now omnipresent in our everyday lives. Most German and US American youths have access to mobile phones, computers or laptops, TV sets and Internet at home and use these for a wide range of activities, such as social networking, gaming, watching TV, listening to music or reading (Medienpädagogischer Forschungsverbund Südwest [mpfs] 2018; Common Sense Media 2015).

This development offers considerable chances for children and youths. In their leisure time, they can enjoy numerous advantages e.g. with regards to communication and entertainment. At the same time, the omnipresence of media poses serious challenges for children and youths, for example, cyberbullying, which has become an impactful worldwide phenomenon, or propaganda. To face media-related chances and challenges, children and youths need to develop competencies which empower them to act appropriately, creatively, socially responsibly and in a self-determined way in this mediatized environment (Tulodziecki 1997; Hobbs 2010; Kultusministerkonferenz [KMK] 2012). It lies within the educational responsibility of parents, but also of teachers and schools, to foster these competencies, to consider the potential and risks related to the impact of media on learning environments and educational processes, to utilize the potential and to prepare students for the challenges of a mediatized world.

With regards to the role teachers play in the integration of media into school and lessons and in the advancement of students' respective competencies, a glance at the professional practices of teachers reveals that there are media-related challenges to be met on different levels. Central examples of such challenges include the media-supported enhancement of lessons, reflective practices and organizational aspects (Spanhel 2017; Redecker 2017). With regards to teaching and learning processes, students can take advantage of a targeted media integration, because teaching and learning processes can be enhanced, the learning environment can be enriched and students' learning and knowledge acquisition can be facilitated (Tulodziecki, Herzig, and Grafe 2019; Gronseth et al. 2010; Sharp 2014). In terms of reflective practices, there are teacher tasks connected to the role of media in today's society; they have become an important object for a guided pedagogical reflection and evaluation with students. Children and youths need to learn how to handle media responsibly,

how to analyze and select media offers reasonably and how to apply social responsibility and ethical principles to adequately respond to the challenges of their daily and multi-dimensional exposure and to meet the requirements of citizenship in a digital age (Hobbs 2010; Redmond 2016; Tulodziecki 2008). Finally, on an organizational level, teachers need to acknowledge the impact of media on educational practices, for example with regards to leadership and governance practices, infrastructure, content and curricula and teachers' professional development, collaboration and networking (Kampylis, Punie, and Devine 2015; Brüggemann and Breiter 2016; Dede 2011).

Given such media-related tasks of teachers, which will be further specified and differentiated in this thesis, it is generally agreed that specific skills and competencies are needed to fulfill complex requirements (Wilson et al. 2011; Kultusministerkonferenz [KMK] 2012; Spanhel 2017) and that initial and in-service teacher education are appropriate and necessary for (future) teachers' acquisition and advancement of these competencies (Blömeke 2003; American Association of Colleges of Teacher Education [AACTE] and Partnership for 21st Century Skills [P21] 2010; Instefjord 2014; Maderick et al. 2016). However, the precise shape, scope, extent and focus of the competencies and their outcomes are less agreed-upon and have been discussed extensively in academic discourse from different angles. A broader approach to this question of teacher competence is offered by the perspective of professionalization discourse, which seeks to answer what makes up professional action competence of teachers. Knowledge and capability, i.e., declarative, procedural and strategic knowledge, are usually understood as central components of teachers' professional action competence (Baumert and Kunter 2006) in this context. With regards to knowledge domains, Shulman's (1986) differentiation between general pedagogical knowledge, subject-matter content knowledge and pedagogical content knowledge has become widely accepted (Baumert and Kunter 2006). The professionalization discourse with all of its facets offers valuable insights into the professional competencies and knowledge of teachers and thus facilitates understanding of requirements. It also provides valid empirical measurements to enhance the validity of findings (Schaper 2009). However, the perspective of competencies and knowledge specific to media and ICT in teachers' professional practice are not yet an established part of this debate. To fill in this gap, it is valuable to consider research about respective media-related educational competencies and competency modeling in detail (Endberg 2018) and to connect the findings with the perspective of the professionalization debate.

Various competency models have been suggested to define and specify the scope of media-related educational competencies to provide a common ground for respective research, to pave the way for assessing and systemizing respective practices and to fulfill a range of further related functions (e.g., Blömeke 2000; FIT Ltd. et al. 2010; Wilson et al. 2011; Mishra and Koehler 2006; Krumsvik 2011; Redecker 2017). Based

on such models, measurement instruments have been developed to operationalize the constructs described by models and to measure the performance of the competencies in question (e.g., Siller 2007; Schmidt et al. 2009; Drummond and Sweeney 2017; Tiede and Grafe 2016; Kapsalis 2019).

Findings from such theory-based and empirical approaches to understanding and defining media-related educational competencies gain relevance for actual practices in initial teacher education by respective concepts and approaches, which helps institutions of higher education ensure that the competencies in question are systematically advanced with preservice teachers. For example, there are guidelines, such as the ISTE standards for educators (International Society for Teaching in Education [ISTE] 2017; cf. Chapter 4.2.2), DigCompEdu (Redecker 2017; cf. Chapter 4.1.3) or the Orientierungsrahmen Medienpädagogik (orientation frame for media pedagogy; Sektion Medienpädagogik 2017), offering orientation for respective objectives in initial teacher education and related study programs across universities, states and countries.

Against the background of the multifaceted discourses about, and applications of, the concept of media-related educational competencies outlined above, it was decided to focus on three main dimensions for the following work, namely modeling, measuring and practices of advancing media-related educational competencies. A concentration on these three dimensions is also supported by related literature; for example, Hartig, Klieme and Leutner (2008) point out the relevance of these three fields for future educational research. Against this background, it is considered beneficial to analyze the three dimensions in depth and critically discuss their relationships.

Given the close relationship of educational practices and their cultural or national background, it is useful to consider more than one country for respective analyses, because initial teacher education is relatively constant when one country is considered on its own. There are aspects of teacher education systems within a country that do not change significantly in the short term, such as the overall structure and organization of teacher education, federal structures in educational issues, or the reputation and role of the teaching profession. Hence, research about teacher education is restricted if it refers to one country and culture only. Contextualizing the situation in different countries allows for looking at the wider picture, opening up the perspective and overcoming the constraints of one's own culturally shaped views, a procedure that allows for valuable insights beyond the own limited perspective (Blömeke and Paine 2008) and that facilitates the acquisition of a "peripheral vision" (Bateson 1994).

Hence, the analyses and discussions introduced in the following work will concentrate on the examples of two countries, namely Germany and the USA. These two countries are considered appropriate for respective comparative considerations

because both of them have a long and comprehensive tradition of scientific discourses on media pedagogy and media education. These discourses often happened separately from each other but still share central concepts and attitudes, which makes them an appropriate starting point for a comparison (Grafe 2011; Blömeke and Paine 2008). Naturally, there are also factors delimiting the comparability of these two countries, such as differing languages and study structures. Further aspects to be considered include the contrastable but not congruent disciplines of *Medienpädagogik*, educational technology and media literacy. Respective analyses of the benefits and challenges of international comparative research and on the comparison of Germany and the USA will be presented in Chapter 3.2.

Researching models and measurements of media-related educational competencies and practices of their advancement, and discussing the links and relationships between these three dimensions in an international comparative perspective, can be considered a research desideratum from several viewpoints. As it has been argued initially, from a normative viewpoint, the digitalized living environment of children and youths necessitates a suitable inclusion of media-related topics into their lessons both to embrace the potential linked to media and to achieve a comprehensive and systematic preparation of responsible and competent future citizens in a digitalized world. Consequently, it is of genuine interest to prepare future teachers appropriately for these complex tasks and to contribute to a systematic competency advancement. The claim of appropriate teacher preparation is realized primarily by initial teacher education programs where preservice teachers can acquire relevant competencies. However, a glance at practice reveals that the current status is not sufficient in all cases and that the media-related education of preservice teachers shows heterogeneous quality and quantity (Foulger et al. 2017; Torres and Mercado 2006; Schiefner-Rohs 2012; Bertelsmann Stiftung et al. 2018). Educational and media pedagogical research has been contributing to the exploration and analysis of the competencies in question and thus to a systematization of respective processes by theory- and practice-based competency models, measurement instruments and numerous related studies. However, numerous deficits have been pointed out, e.g., with regards to a sound scientific foundation (Schiefner-Rohs 2012; Brantley-Dias and Ertmer 2013), empirical validation (Endberg 2018; Archambault and Barnett 2010) and systematic implementation into initial teacher education and its assessment (Culver and Redmond 2019; Bertelsmann Stiftung et al. 2018). Hence, a comprehensive analysis of the competencies in question that takes into account and links all of the three perspectives of modeling, measuring and advancing competencies is a research desideratum.

The following dissertation will correspond to this research desideratum and introduce a theory-based and empirical analysis of the competencies in question, which will be referred to as media-related educational competencies, from a

comprehensive and multidimensional perspective by selected examples from two countries. In accordance with the central aspects outlined, the three main dimensions focused on are models of media-related educational competencies, their measurement and practices of advancement from an international comparative perspective, as well as the interplay of these three dimensions.

On this basis, the following research questions will guide the work:

- Which central models of media-related educational competencies are there in German and US research, and what are their shared characteristics and differences?
- How can media-related educational competencies be measured, and which instruments are used for the models introduced?
- How are media-related educational competencies advanced in German and US American study programs of teacher education?
- What is the relationship between modeling, measuring and advancing media-related educational competencies in both countries?

To provide a basis for subsequent considerations, a chapter on the theoretical frame will clarify the topic and scope of research and central definitions, and a chapter on the methodological frame will introduce methodological choices which influence the overall perspective of the dissertation. In the following, the dissertation is structured in three main parts, which correspond to the three main dimensions of researching the media-related educational competencies outlined.

Part I is concerned with the context and theoretical foundations of competency modeling. It contextualizes the models selected for in-depth analysis by references to related national and international concepts, and it discusses theoretical aspects of competency modeling. Against this background, a systematic and category-based comparison of three selected models of media-related educational competencies with differing backgrounds is introduced to illustrate characteristics, influences, benefits and challenges of competency modeling. The models selected are the European Digital Competence Framework for Educators (DigCompEdu; Redecker 2017), the German M^3K competency model of *medienpädagogische Kompetenz* (M^3K; Herzig et al. 2015; Tiede and Grafe 2016) and the US American model of Technological, Pedagogical and Content Knowledge (TPACK; Mishra and Koehler 2006).

Part II then focuses on the measurement of media-related competencies. General characteristics of competency measurement are outlined and respective considerations of measurement instruments of the three models previously compared are added. Afterward, Paper 1, "Media Pedagogy in German and U.S. Teacher Education," provides an example of competency measurement by introducing a comparative study which was conducted with German and US preservice teachers focused on media-related educational competencies.

Part III extends the perspective to current practices of advancing media-related educational competencies in teacher education and related educational study programs in both countries and analyses the *status quo* and stakeholders. The second paper, "The Integration of Media-Related Studies and Competencies into US and German Initial Teacher Education. A Cross-National Analysis of Contemporary Practices and Trends" completes the examination with an expert interview study which explores models, possibilities and varieties of integrating the competencies into teacher education, the outcomes of such processes and the stakeholders who have an influence in this field.

Based on these analyses, the Conclusion draws together the different strands, summarizes the overall results, emphasizes the relationship between models, measurements and practices of advancing media-related educational competencies and points out perspectives for further research.

The doctoral degree regulations at the University of Würzburg allow for a semi-cumulative format, which means reducing the number of papers included in the dissertation for the benefit of a larger share of additional frame text. The following two papers are included in this dissertation:

Paper 1: Tiede, Jennifer, and Silke Grafe. 2016. "Media Pedagogy in German and U.S. Teacher Education." *Comunicar* 24 (49): 19–28. https://doi.org/10.3916/C49-2016-02.

Abstract: Various research works and practitioners conclude that media pedagogy should be integrated in teacher education in order to enable future teachers to use media for their lessons effectively and successfully. However, this realization is not necessarily reflected in actual university curricula, as preservice teachers at some places can still finish their studies without ever dealing with media pedagogical issues. To understand, assess and eventually improve the status of media pedagogical teacher education, comprehensive research is required. Against this background, the following article seeks to present a theory-based and empirical overview of the status quo of preservice teachers' pedagogical media competencies focusing Germany and the USA exemplarily. To form a basis, different models of pedagogical media competencies from both countries will be introduced and the extent to which these competencies have become part of teacher education programs and related studies will be summarized. Afterwards, method and selected results of a study will be described where the skills in question were measured with students from both countries, based on a comprehensive model of pedagogical media competencies that connects German and international research in this field. The international comparative perspective will help broaden the viewpoint and understand differences, but also similarities. These data serve to identify different ways of

integrating media pedagogy into teacher training and draw conclusions on the consequences these processes entail for preservice teachers and their pedagogical media competencies.

Zusammenfassung:

Verschiedene Forschungsarbeiten und Praktikerinnen und Praktiker kommen zu dem Ergebnis, dass Medienpädagogik ins Lehramtsstudium integriert werden sollte, damit zukünftige Lehrerinnen und Lehrer befähigt werden, Medien effektiv und erfolgreich in ihren Unterricht einzubinden. Diese Erkenntnis spiegelt sich aber nicht unbedingt in heutigen universitären Curricula wider, denn Lehramtsstudierende können mancherorts immer noch ihr Studium abschließen, ohne sich jemals mit medienpädagogischen Fragestellungen auseinander zu setzen. Um den Status der medienpädagogischen Lehrerbildung zu verstehen, einzuschätzen und letztlich zu verbessern, ist umfangreiche Forschung nötig. Vor diesem Hintergrund stellt der folgende Artikel einen theoriebasierten und empirischen Überblick über den aktuellen Status der medienpädagogischen Kompetenzen Lehramtsstudierender vor und nimmt dabei exemplarisch Deutschland und die USA in den Blick. Grundlegend werden verschiedene Modelle medienpädagogischer Kompetenzen aus beiden Ländern vorgestellt und der Umfang, in dem diese Kompetenzen Teil von Lehramtsstudiengängen und verwandten Studien geworden sind, wird zusammengefasst. Anschließend werden die Methodik und ausgewählte Ergebnisse einer Studie beschrieben, in der die relevanten Fähigkeiten bei Studierenden aus beiden Ländern gemessen wurden, basierend auf einem umfassenden Modell medienpädagogischer Kompetenz, welches deutsche und internationale Forschung in diesem Feld verbindet. Die international vergleichende Perspektive wird dazu beitragen, die Perspektive zu weiten und Unterschiede, aber auch Ähnlichkeiten zu verdeutlichen. Diese Daten dienen dazu, verschiedene Wege der Integration von Medienpädagogik ins Lehramtsstudium zu identifizieren and Schlussfolgerungen zu ziehen zu den Konsequenzen, die diese Prozesse für Lehramtsstudierende und ihre medienpädagogischen Kompetenzen mit sich bringen.

Paper 2: Tiede, Jennifer, and Silke Grafe. 2019. “The Integration of Media-Related Studies and Competencies into US and German Initial Teacher Education. A Cross-National Analysis of Contemporary Practices and Trends.” In *Proceedings of Society for Information Technology & Teacher Education International Conference*, edited by Kevin Graziano, 1709–17. Las Vegas, NV, United States: Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/p/207873.

Abstract: Many institutions of initial teacher education have realized the necessity to integrate media-related studies into their curricula. However, there are no binding regulations for these processes. As a result, the shape and extent of respective activities varies considerably, not only between different countries, but also within countries with decentralized educational structures such as Germany and the USA. The following paper will present the results of 11 interviews with experts from Germany and the USA which explored current practices and trends in the integration of media-related studies and competencies into initial teacher education. The data collected focus on models of media-related educational competencies, on possibilities and varieties of integrating media-related studies into teacher education curricula, on the outcomes of such efforts and on stakeholders who influence these processes. The cross-national comparative perspective will help contextualize the findings and draw conclusions on the status quo.

Zusammenfassung: Viele lehrerbildende Institutionen haben die Notwendigkeit erkannt, medienbezogene Studieninhalte in ihre Curricula einzubinden. Dennoch existieren keine verbindlichen Regularien für diese Prozesse. Deshalb variieren Form und Umfang der entsprechenden Aktivitäten stark, nicht nur zwischen Ländern, sondern auch innerhalb von Ländern mit dezentralen Strukturen in Bildungskontexten, so wie Deutschland und die USA. Der folgende Artikel wird die Ergebnisse von 11 Interviews mit deutschen und US-Amerikanischen Expertinnen und Experten vorstellen, in denen aktuelle Praktiken und Trends bei der Integration von medienbezogenen Studien und Kompetenzen ins Lehramtsstudium untersucht wurden. Die gesammelten Daten fokussieren Modelle medienbezogener pädagogischer Kompetenz, Möglichkeiten und Arten der Integration medienbezogener Studieninhalte in Lehramtscurricula, die Ergebnisse dieser Bemühungen und Stakeholder, die diese Prozesse beeinflussen. Die international vergleichende Perspektive wird dazu beitragen, die Ergebnisse zu kontextualisieren und Schlussfolgerungen zum aktuellen Stand zu ziehen.

Further publications in the thematic context of this dissertation published by the author are Tiede and Grafe (2020), Boos, Tiede, Grafe, and Hesse (2016), and Tiede, Grafe, and Hobbs (2015).

2. Terminological Frame: A Clarification of Key Concepts

It has been stated initially that the competencies teachers need to successfully meet the multi-faceted requirements of media in educational contexts are of core interest for this dissertation. The competencies considered necessary or desirable, e.g., from normative or empirical viewpoints, vary from source to source and from perspective to perspective. Against this background of conceptual multiplicity, the following chapter will provide an overview of the inherent concepts in three steps. First, it will be clarified how to understand competences and competencies. In a second step, the perspective will be narrowed down to the professional competencies of teachers. Finally, it will be concretized what this means for the professional competencies in relation to media and how established concepts approach and define this topic. Against the background of these terms and definitions, different competency models have been developed in related research to substantiate the definitions and include aspects, areas or fields of competencies to describe precisely what constitutes a competence. Such models will be analyzed in detail in Part I, building on the following fundamental semantic considerations.

2.1 Competence

First, it is necessary to clarify what a *competence* or *competency* is, because this term is often used in various contexts. According to Klieme and Hartig (2007), it is essential for any reflection on human behavior and for its theoretical and empirical investigation. A growing use of the concept of competence in scientific and political contexts has led to a broad variety of definitions even within cultures or languages (Shavelson 2010) – an observation that leads Weinert (2001a) to talk about "conceptual inflation" (Hartig and Klieme 2006, 128), while Le Deist and Winterton (2005) even call competence such a "fuzzy concept" (p. 29) that they find it impossible to identify one coherent theory or definition that reconciles all usages. Against the background of this wide base, the focus will be narrowed down to educational contexts in the following.

Based on a broad review of competence definitions and models from the backgrounds of Human Resource Management and Vocational Training and Education, Sampson and Fytros (2008) define competence as

> "a set of personal characteristics (e.g. knowledge, skills, attitudes) that an individual possess [*sic*] or needs to acquire, in order to perform an activity within a specific context. Performance may range from the basic level of proficiency to the highest levels of excellence." (p. 66)

This definition comprises three main dimensions which have been deduced from the review. The first dimension is personal characteristics, which do not only include knowledge, skills and attitudes but also further aspects, such as abilities, behaviors, traits, values, motives, self-concepts, aspects of one's self-image, social role and/or self-control (Sampson and Fytros 2008). The second dimension refers to the competence proficiency level. The authors see *proficiency* as a quantifying dimension of competence, with proficiency levels being used to classify competences at specific levels according to an individual's performance. The third dimension stresses the influence of the context in which the competence is used, as, for example, functions, occupations or specific tasks.

A more complex analysis of uses of the term *competence* is presented by Weinert (1999), who can be allocated to the pragmatic-functional tradition of American psychology (Klieme and Hartig 2007). In an attempt to create an overview of competence definitions, he differentiates six kinds of competences:

1. Competences as *general psychological, dispositional constructs* which help people master a variety of tasks;
2. Competences as *specific performance dispositions* which relate to specific classes of situations and requirements functionally. These specific performance dispositions can also be characterized as knowledge, skills, or routines;
3. Competences as the *motivational orientations* needed for mastering challenging tasks;
4. *Action competence* as an integration of the first three concepts, related to the demands of a specific field of action, e.g., for a profession;
5. *Meta competences* as the knowledge, strategies or motivations that facilitate the acquirement as well as the application of specific competences;
6. *Key competences* as competences in a functional sense as described in 2), but relevant for a quite broad variety of situations or demands. This includes things like native language skills or mathematic skills. (Weinert 2001b; translation slightly adapted from Dehmel, Li, and Sloane 2011, 16)

In later works, Weinert summarizes and narrows down these approaches to the following definition, which has been widely acknowledged: "cognitive abilities and skills that individuals either have or can acquire to solve specific problems as well as related motivational, volitional and social willingness and abilities for taking successful and conscious advantage of problem solutions in varying situations" (Weinert 2001b; translation slightly adapted from Dehmel, Li, and Sloane 2011, 16). This definition is frequently referred to as a standard within German literature (Dehmel, Li, and Sloane 2011). It shows parallels to the afore-mentioned definition of Sampson and Fytros (2008) in terms of individual characteristics and context reference but differs otherwise, as it does not include the notion of competency levels or a quantification of proficiency.

In the context of the ambiguities and differences inherent in different concepts of *Kompetenz*, the English language brings about another complexifying element by differentiating between *competence* and *competency*. This differentiation is non-existent in German, where the concept is consistently called *Kompetenz*. In English, the differentiation of *competence* and *competency* is disputable, and sometimes both terms are even considered interchangeable and used inconsistently (Le Deist and Winterton 2005; Sampson and Fytros 2008). Against this background, the understanding and differentiation of *competence* and *competency* in this work are based on Blömeke, Gustafsson, and Shavelson (2015), who argue from the perspective of educational research and summarize:

> "There is some agreement […] that "competence" (plural "competences") is the broader term whereas "competency" (competencies) refers to the different constituents of competence. The first term describes a complex characteristic from a holistic viewpoint whereas the latter takes an analytic stance. The constituents (or resources) may be cognitive, conative, affective or motivational. […] Competence and competency are regarded as learnable and can thus be improved through deliberate practice." (p. 5)

This understanding is supported also by Sampson and Fytros (2008) who, in reference to Cheetham and Chivers (2005), claim that "competencies are only a subset of the required competences for a given professional and/or academic field" (p. 159).

A reoccurring issue in the context of competence and competency definitions is the relationship to the term *skills*. In the formerly mentioned definitions of the concept of competence, it becomes clear that skills are often understood as one constituent of competence, among others such as mindsets and knowledge (Sampson and Fytros 2008; Weinert 2001b). This understanding is echoed and further specified in the definition of Council of Europe (2016), where *skill* is defined as "the capacity for carrying out complex, well-organised patterns of either thinking or behavior in an adaptive manner in order to achieve a particular end or goal" (p. 44) and constitutes competence together with values, attitudes and knowledge and critical understanding (p. 35).

2.2 Professional Teacher Competence

The previous definitions offer insights into shapes and understandings of the construct of competence, and it has become evident that the viewpoint of the respective discourse is of central importance in this regard. Hence, it is consistent to consider the relevance to the context of teaching as a profession. In the professionalization debate, questions of competency modeling and acquisition are linked to the question of what makes up the professionalization of teaching and professional teacher

knowledge. It builds on the notion that teaching is a professional practice and thus to be differentiated from non-professional occupations, although this distinction is arguable (Bonnet and Hericks 2014; Martin 2017). Among other characteristics, professional practice also means acting in highly complex systems and having substantial influence on the lives of others, which therefore requires a complex academic education and respective competencies (Terhart 2011; Hericks and Stelmaszyk 2010; Martin 2017). The focus on competencies is congruent with empirical evidence suggesting that learning achievements depend on the quality of instruction and that this quality of instruction depends significantly on the professional knowledge of teachers. Hence, a causal relationship between poor professional knowledge and poor student learning achievement is assumed (Köller 2012; cf. also Martin 2017).

The professional action knowledge and competencies teachers should possess are specified by established approaches. According to Baumert and Kunter (2006), the professional action competence of teachers is usually understood as an interplay of knowledge and skills, i.e., declarative, procedural and strategic knowledge. Shulman's (1986) work is received as an important foundation in this context. He specifies the relevant knowledge domains in this context as general pedagogical knowledge, subject-matter content knowledge, and pedagogical content knowledge (PCK) and thus advances an innovative notion of blending the formerly distinct areas of pedagogy and content (Mishra and Koehler 2006). A considerable number of authors from international contexts adopted this concept, specified components and thus developed a range of models of professional action competence of teachers (e.g., Baumert and Kunter 2006; Grossman 1990; 1995; Bromme 1992; 1997; Sherin 1996).

According to Endberg (2018), such a professionalization approach has been producing rich opportunities and sound approaches for modeling and measuring subject-specific competencies successfully, while empirically sound evidence is yet challenging to achieve for media pedagogy research. The author points out that there are only scarce connections between the professionalization approach and the field of media pedagogy as far as the competencies teachers need in relation to all kinds of media-related tasks are concerned, especially in the German discourse. She concludes that an exception to this separation of discourses on the professional action competence of teachers and on the media pedagogical perspective can be found in the TPACK model (cf. Chapter 4.2.1). While this viewpoint on media pedagogical research as detached from the scientific professionalization discourse and overall lack of empirical evidence can be challenged against the background of models beyond TPACK, such as M^3K, the criticism yet emphasizes the necessity to clarify the distinct perspective of media pedagogical research on respective teacher competencies. A respective overview will be provided in the following.

2.3 Medienpädagogische Kompetenz

From the 1970s, a vivid scientific discourse on the concept of *Medienkompetenz* [media competence] emanated from German educational research, building on the works of Baacke (1973; 1996; 1997) to acknowledge changing opportunities and challenges for education in connection with the spread and increasing availability of media (Tulodziecki 2012). *Medienkompetenz* describes the "ability to apply all kinds of media for the communicative and action-related repertoires of humans in a way that actively acquires the world" (Baacke 1996, 6; own translation). In other words, it is understood that individuals who are *medienkompetent* are ready and able to act appropriately, self-determined, creatively and socially responsible in media contexts (Tulodziecki, Herzig, and Grafe 2019, 80). Central established concepts and definitions building on Baacke's work also include related works by Aufenanger (e.g., 1997; 1999; 2001), Tulodziecki (e.g. 1997), Schorb (2005), or Spanhel (1999; 2006; cf. Tulodziecki, Herzig, and Grafe 2019; Tulodziecki and Grafe 2019). From a terminological and conceptual perspective, the term *Medienkompetenz* has also been challenged and reconsidered repeatedly, e.g., in relation to the terms *Medienbildung* (Tulodziecki 2010; 2011) or *digitale Kompetenzen* (Kerres 2018).

Against this background of the discourse on *Medienkompetenz*, in the 1990s, German educational researchers began to acknowledge the need for a concept of extended teacher competencies that amend and exceed the teachers' own competent use of media and *Medienkompetenz* (Tulodziecki 2012). It was realized that media influence educational processes and thus the professional practice of teachers both indirectly and directly. On the one hand, the living environment which is infused by media impacts conditions, objectives, tasks and contents of professional teaching practice. On the other hand, media have a direct impact on possibilities, shapes, methods and structures of communicative, pedagogical and professional teacher actions. These influences were now understood to require appropriate and specific competencies of teachers to cope appropriately with the challenges connected to it (Spanhel 2017). This way, the concept of *Medienpädagogische Kompetenz* evolved (Tulodziecki 2012) to describe the competencies teacher need to fulfill all kinds of media-related challenges in their professional practice. It literally translates as "media-pedagogical competence" or, as translated in the M^{3}K-project, as "pedagogical media competencies" (Tiede and Grafe 2016).

In this context of German educational research, a critical reflection on the use of competence concepts in media educational research was published by Tulodziecki (2010; 2011). Concentrating on the term *Medienkompetenz* [media competence], the author points out a systematic problem in its usage: it is used both as a general condition or characteristic in media-related actions and as an objective in the sense of competency acquisition, as emphasized, for example, by Sampson and Fytros (2008). As a solution, Tulodziecki (2010; 2011) suggests using the term *Medienkompetenz* in

the latter context to reflect on objectives and differing proficiency levels in the field and to speak about *Medienbildung* for media-related processes of educational relevance (cf. also Schorb 2009; Hugger 2006; Marotzki and Jörissen 2008). Overall, the term *medienpädagogische Kompetenz* is agreed upon now and considered well-established in the contemporary German scientific discourse.

2.4 Media Literacy and Pedagogical Digital Competence

In the English language, related terminology is less consistent. The competencies of applying and using media for a wide range of purposes, as represented in the German concept of *Medienkompetenz*, is referred to as *digital literacy* (Buckingham 2006), *media literacy* (Hobbs and Jensen 2009), *digital competence* (Ferrari 2012; 2013) or *media competence* (Ferrés and Piscitelli 2012). However, with regards to the denomination of what corresponds to the German concept of *Medienpädagogische Kompetenz*, some authors, such as Voogt (2012), avoid using a comprehensive term at all and paraphrase it, for example, as "competencies teachers need to be able to teach in the knowledge society" (p. 17). Related terms that are used in English research include, but are not limited to, *student teachers' digital competence* (Røkenes and Krumsvik 2014), *digital competence of educators* (Redecker 2017), *teacher ICT competency* (FIT Ltd. et al. 2010) or *pedagogical digital competence* (From 2017). To achieve an enhanced understanding of the varieties and differences in reference to central terminology, it is therefore useful to look at selected definitions of *educators'* or *pedagogical digital competence(s)* as one example of a term used frequently in this context.

In the context of the European framework DigCompEdu, Redecker (2017) speaks about *educators' digital competences* as competencies needed "to effectively use digital technologies for teaching" (p. 15). This definition is comparably narrow and considers the perspective of teaching with media only, to the disadvantage of further competency aspects such as fostering students' media literacy or using media in contexts of professional development, which are actually included in the DigCompEdu model. The emphasis of effectivity reveals a functional viewpoint and points to an understanding of education as an improvable ecosystem with maximizable effectiveness, a perspective which might also be rooted in the political motivation and understanding of competencies behind the definition and model development process, because it naturally strives for systematic improvements and an emphasis on effectiveness.

A second definition can be found in From (2017), who postulates

> "the ability to consistently apply the attitudes, knowledge and skills required to plan and conduct, and to evaluate and revise on an ongoing basis, ICT-supported teaching, based on theory, current research and proven experience with a view to supporting students' learning in the best possible way." (p. 43)

Like in the case of Redecker's (2017) definition, the focus is on "ICT-supported teaching," i.e., teaching with media. Besides, this definition represents a more complex approach. The construct of *competencies* is broken down to *attitudes*, *knowledge* and *skills* – this resembles the competency understanding proposed by Sampson and Fytros (2008) on first sight but neglects the corresponding explanation emphasizing that attitudes, knowledge and skills are only three examples out of a range of personal characteristics. The definition includes different iterative phases of media-supported teaching. Moreover, the foundation of media-supported teaching is divided into theory, research and experience, and the overall objective of these competencies is specified by an optimized contribution to supporting student learning. Notably, this more complex approach stems from a university background, and the wider perspective supports the claim of providing a well-founded definition based on relevant research sources. From (2017) mentions the objective of supporting students' learning, which implies an understanding of the teacher's role in educational processes as a facilitator and supporter of students who are consequently accepted as active and self-directed learners. This view shows references to constructivist learning approaches and acknowledges the opportunities offered by digital media in terms of fostering innovative role assignments and learning formats.

Instefjord (2014) summarizes "digital competence in teacher education" as "knowledge, skills and attitudes required in order to use technology critically and reflectively in the process of building new knowledge" (p. 156). As in the case of From's (2017) definition, *attitudes*, *knowledge* and *skills* are used to specify *competencies*. Again, the scope of this definition is rather narrow because it only includes the context of knowledge building and thus neglects, e.g., a media-related organizational perspective. Yet a direct comparison suggests slightly different assumptions. Learning is referred to as "building knowledge," which represents a constructivist understanding again. However, the actor remains unclear and the students' perspective is not explicitly considered. Since the definition focuses on the attitudes, knowledge and skills of preservice teachers, the interpretation seems likely that the preservice teachers themselves are understood to build the knowledge for and with students. This contrasts with the view of From's (2017) definition, where teachers are understood as mentors and supporters for students in their own construction of knowledge. Thus, it implies a different perspective on teaching and learning processes and on roles in educational and knowledge-construction processes, which ultimately

impacts the nature of the competencies in question. It is interesting to visualize these differences, especially because both authors work in an academic context and even share a Scandinavian background. Obviously, there is a certain range in understanding digital competence, even if researchers share comparable presumptions.

Krumsvik (2011) postulates a definition of digital competence as "the teacher/TEs' proficiency in using ICT in a professional context with good pedagogic-didactic judgement and his or her awareness of its implications for learning strategies and the digital Bildung of pupils and students" (pp. 44–45). Against the background of the previously mentioned examples, it becomes evident that this definition is comparably broad in its scope. "Using ICT in a professional context" does not only include the perspective of teaching with media, it can also refer to a range of further media-related educational tasks teachers have to meet, such as professional development or supporting students' acquisition of media literacy. The awareness of learning strategies and the digital Bildung of pupils and students supports this broad perspective and unites the foci both on the teacher and students. This corresponds to Krumsvik's (2011) understanding of his Scandinavian perspective, as he explains that

> "competence as a concept has a broader, more holistic meaning in Scandinavian English than in traditional English. […] Teachers' digital competence is seen to incorporate a more complex and holistic level of proficiency in the use of ICT with pedagogical judgement in educational contexts." (p. 44)

However, in comparison to the other definitions, the translation of *competence* as *proficiency* stands out. As discussed above, *proficiency* indicates a level of competency rather than explaining or substituting for the term; the terminology appears imprecise at this point. Overall, the third Scandinavian academic approach to defining educational digital competence brings about a third unique perspective and supports the assumption that there is conceptual ambiguity even within one context.

All in all, the considerations in this chapter reveal that there is a conceptual variety in the understanding of *competence* with regards to the perspectives of different countries but also in terms of research traditions and pedagogical viewpoints. The denomination of the media-related competence in question is subject to discussion and is treated differently in different contexts. As Spante, Hashemi, Lundin, and Algers (2018) confirm, in accordance with the findings from the definitions mentioned above, there are regional differences in the use of terms like *digital literacy* and *digital competence*. Based on a systematic review in the context of related concepts in higher education, the authors conclude that concepts, usages and definitions vary strongly and that *digital competence* tends to be used in European contexts, while the USA, and the UK and Ireland, tend to refer to *digital literacy*. The authors also state that the term *digital literacy* is mentioned or used without further definition or explanation in a majority of sources, whereas *digital competence* is mostly defined in

multiple contexts and sometimes even discussed further and/or developed. Furthermore, there are concepts of digital competence which are specifically targeted at the competencies of (preservice) teachers in the sense of *medienpädagogische Kompetenz*, while there is no specific model of media literacy of (preservice) teachers.

However, it is important to acknowledge that such definitions and concepts are not mutually exclusive. As the examples selected illustrate, they rather represent different approaches to one shared topic and are always shaped by their background. It is noteworthy in this context how terminological considerations reveal that a specific research discourse on the competencies teachers need in relation to media is less established in US research, which otherwise has a strong tradition of research on students' and citizens' media literacy. Instead of an elaboration on the concept of specific teacher competencies, there are practically oriented guidelines in the USA to help educators teach with and about media (cf. the ISTE standards and the NAMLE Core Principles of Media Literacy Education, Chapter 4.2), structural considerations from a professionalization-oriented perspective on knowledge rather than on competencies (cf. TPACK, Chapter 4.2.1) and an increasing interest in the competencies of teacher educators with regards to teaching with media, i.e., educational technology (cf. the TETCs, Chapter 4.2.4). It will be relevant for the following considerations to bear these different approaches to the research field of media-related educational competencies in mind.

3. Methodological Frame: Approaching Media-related Educational Competencies from an International Comparative Perspective

3.1 "Media-related Educational Competencies" as a Tertium Comparationis

The heterogeneity of terms and definitions outlined in the previous chapter indicates that a thorough comparative analysis of the competencies in question requires a careful selection of terminology. In addition to this, it is advisable, especially in the context of comparisons, not to use a specific definition or approach from one of the objects to be compared. Employing categories and terms from one concept and applying them to other objects would also entail applying the ideas, background and meaning that shape this concept to others and thus giving up a neutral and unbiased perspective. Instead, it is an established practice in the field of comparative educational research to take a step back from specific definitions and approaches and to use a *tertium comparationis*, which means finding a neutral superordinate category instead of applying terminology or concepts from one of the objects (Waterkamp 2006; Bereday 1964). Against this background, it was decided for the following work to refer to the competencies in question as *media-related educational competencies* as a working term in the sense of a previously unestablished *tertium comparationis*. *Media* in this context are understood as mediators by which potential signs in communication contexts can be recorded or created and transferred, played back or processed and presented as an image or symbol, with technical support (Tulodziecki, Herzig, and Grafe 2019). This definition includes means such as books and newspapers but also digital media like films and TV, computers, tablets or smartphones. Against the background of this definition, it makes sense for the field of media pedagogy in general – and for the focus of the following work and of the competencies to be explored – to concentrate on those modes of experience which are technically conveyed and technically available (Tulodziecki and Grafe 2019). The compound *media-related* in this context includes all kinds of contexts in which such technical agents come into play, either in direct use, e.g., as a means for purposes of illustration, or indirectly, e.g., as an object of reflection.

The adjective *educational* emphasizes the systematic connection of the analyses to the field of educational sciences. It should be noted in this context that the precise scope and understanding of *education*, which is at the core of this science, depends on the respective context and language. In German, there are the two complementary concepts of *Erziehung* and *Bildung*, which both translate as *education*. As Adick (2008) points out, this raises the issue of the relationship between these concepts and puts into question their comparability. She concludes that both concepts of education, *Erziehung and Bildung*, can be accepted as the objectives for comparative reflections in educational science and that it is possible to communicate about this

across languages. Hence, *educational* appears as an adequate adjective for the purpose of allocating the *tertium comparationis* to the fields of educational science and the corresponding German *Erziehungswissenschaft*. At the same time, there is a second function of this adjective: it is necessary to make a clear distinction between media-related educational competencies and concepts such as *Medienkompetenz* [media competence] or media literacy, which do not focus on the educators' or teachers' perspective and the specific pedagogical requirements. As pointed out in Chapter 2, such a distinctive lexeme is also reflected in existing terms, as for example in *Medienpädagogische Kompetenz* or in *digital competence of educators*.

Finally, considering the difference between *competence* and *competency* both terms are generally suitable for the following analysis because both the holistic concept and its constituents are focused. However, an analytic viewpoint is a central concern because, especially in the context of comparative research, it is also necessary to consider different concepts and competency aspects on a microlevel. Hence, the term and dimension of *competencies* will be focused in the following.

All in all, the suggested working term *media-related educational competencies* fulfills the purpose of being neutral, and it can be understood to include and refer to the concepts mentioned above, from the perspectives of both German and English, without using one of them. Consequently, the term does not share a definition of one of the concepts it includes but is meant to apply to all aspects, in the sense of skills, knowledge, attitudes, etc., which are introduced by the different concepts. Persons in an educating role, such as preservice teachers or inservice educators, should know and be capable of these aspects in the context of media and information technologies in school-related or educational settings to fulfill a wide range of media-related tasks and respective challenges successfully and efficiently.

3.2 International Comparative Research

3.2.1 International Comparative Methodology

Working by the methodology of international comparative research means comparing "issues or phenomena in two or more countries, societies or cultures" (Hantrais 2009, 2), which has been described to be not only a method but also a strategy that influences the whole research process from design to analysis (Hantrais 2009). Applying such an international comparative perspective brings about a number of benefits and challenges.

It has been claimed repeatedly in research that it is a central deficit of teacher education research to apply a focus too narrow e.g. in terms of nationally, locally or thematically restricted viewpoints, which is why broader perspectives are needed

(Grossman and McDonald 2008; König et al. 2011). Opening up the perspective to more than one country will enrich insights, contextualize findings and provide a sound basis for conclusions on different levels:

> "Properly done, comparative education can deepen understanding of our own education and society; it can be of assistance to policymakers and administrators; and it can form a most valuable part of the education of teachers. Expressed another way, comparative education can help us understand better our own past, locate ourselves more exactly in the present, and discern a little more clearly what our educational future may be." (Noah 1986, 154)

Consequently, studies and research taking on an international comparative perspective are beneficial in many ways because they allow for grounded conclusions with regards to generating, interrogating, testing or supporting hypotheses and theory, if applied correctly. They facilitate deeper learning about other cultures and thus provide deeper understanding about one's own culture, which is important in terms of avoiding ethnocentrism (Hantrais 2009), i.e., a "view of things in which one's own group is the center of everything, and all others are scaled and rated with reference to it" (Sumner 1906, 213), which is clearly counterproductive for an analysis aimed at objective and transferable conclusions. Further potential benefits include understanding important tendencies shared across nations (Fedorov, Levitskava, and Camarero 2016) and evaluating the educational processes of one's own nation against the background of other well-performing nations (Torney-Purta 1990; LeTendre et al. 2001); this can be helpful for stimulating systematic improvements (Iyengar, Witenstein, and Byker 2014; Altun 2007) and informing policy (Hantrais 2009).

However, as the condition "properly done" in Noah's (1986) quotation implies, the success of intercultural comparative analyses is related to and dependent on special challenges. Harkness (2008) points to the central issue of comparability, which in this context means that "the properties of data, questions, meanings, or populations, and so forth admit and justify comparison" (p. 60). Comparability needs to be enhanced by appropriate, yet not necessarily total standardization (Harkness 2008). The challenge of comparability is related to differences between cultures because different cultures have heterogeneous preconditions, understandings, or contexts. Teacher education in particular is closely tied both to its cultural and national background, for example, in terms of the influence of historical developments, its dependence on policy and its central role in and relevance for society. Therefore, an international comparative view on teacher education needs to be particularly aware of the restrictions and requirements of comparability. In this context, language and meaning are of core importance. Translation processes are often necessary but bring along certain risks, because, in the transfer of concepts and terms, connotations and

shades of meaning are at risk of being neglected. In some cases, the English language, which is usually used as a target language for such comparisons, does not include terms that other languages offer and vice versa (Blömeke and Paine 2008). As argued above, the German concepts of *Bildung* and *Erziehung*, both translating as *education*, are insightful examples for such a discrepancy, which can yet be approached by the methods of comparative education (Phillips 2006; Adick 2008). Further problematic terms in this context also include the central concepts of *Kompetenz*/competence, *Didaktik*/didactics and *Pädagogik*/pedagogy, which all have a literal translation but are used in differing contexts and carry differing connotations (Grafe 2011).

Such challenges concerning the comparability of results from different cultures as mentioned, e.g., by Harkness (2008) and Blömeke and Paine (2008) do not render intercultural comparative research impossible or necessarily deficient but highlight a need for an increased acknowledgment of specific comparative facets, viewpoints and methods. On a general level, the findings of LeTendre et al. (2001) support an assumed comparability of educational institutions and systems despite cultural differences. The authors juxtapose German, US and Japanese institutional isomorphism, i.e., largely homogenous and similar educational processes and teacher and schooling systems around the world, with their cultural variation. They conclude that there is a certain overemphasis in research on cultural impact. This is described as misleading researchers to neglect the fact that schooling and teaching, and in this sense teacher education as well, are systems which share similar predicaments. Hence, it seems acceptable to compare them even if there are differences on the cultural level, as pointed out above.

Moreover, with regards to the challenges outlined above, there are established approaches developed in international comparative research which are commonly applied to ensure valid results and comparability of materials, particularly of test instruments, from and for different cultural and language backgrounds. It has been described that translations are an important element in this context, and there are elaborate measures to achieve validity and applicability of translations, such as elaborate team translation approaches (cf. Harkness 2008; Survey Research Center 2010). Naturally, the comparability of test results depends on factors beyond translation and has to be ensured with regards to multiple viewpoints. Blömeke (2011) lists the following aspects as central when seeking validity and equivalence in comparative studies: first of all, ensuring content validity, which includes establishing personal relationships as a precondition of successful intercultural communication, understanding different ways of speaking and thinking as a precondition for the development of several project steps, and realizing, processing, and interpreting new information; and secondly, ensuring the empirical equivalence of data. In terms of the design of appropriate questions, Harkness (2008) suggests considering different options such as simultaneous, parallel and sequential approaches, and ask-different-questions

models or ask-the-same-question approaches. Furthermore, she points out that complex adaptations of different kinds can be necessary to enhance comparability, which means changing contents or design components of a question to make it more suitable for a new sociocultural context or population.

Against the background of these conditions, the intercultural comparative perspective is considered an applicable approach for the objective of exploring models, measurements and practices of advancement of media-related educational competencies in this dissertation because a comparative perspective will provide insights which go beyond the restrictions of one cultural background and thus increase the relevance and informative value of the analyses and conclusions. As argued above, teacher education in particular is closely tied to its national and cultural background, and looking at it from a comparative and comprehensive perspective helps avoid ethnocentrism and at the same time corresponds to the research desiderata postulated, e.g., by Grossman and McDonald (2008) and König et al. (2011) in terms of broadened perspectives.

With regards to the challenges pointed out above, measures need to be taken in this work to ensure valid and worthwhile conclusions. Comparability and tenuous translations have been identified as key issues in this context. Consequently, it was decided to retain the concept of *Medienpädagogische Kompetenzen* in German because of its central value for the topic of the dissertation and because a translation such as *media pedagogical competencies* or *pedagogical media competencies* can be expected either to carry different connotations and meanings than the original term or to be difficult to understand at all. The same applies to a number of further important terms, for example, *Mediendidaktische Kompetenz* or *Medienerzieherische Kompetenz*. However, retaining all of these problematic terms in their original language would affect the readability and understandability of the text. Hence, these further terms will either be subscribed by suitable periphrases and *tertia comparationis* such as “teaching with media” as a reference for *Mediendidaktik* or, if unavoidable, particularly in the context of introducing German models, be translated with literally appropriate terms. But, for their contextualization and understanding, it is advisable to keep in mind their origin and context, which will be supported by references to the original terms. Additionally, from an empirical perspective, measures will be taken to ensure comparability at the best. A complex adaptation process will be applied for a competency measurement instrument, which will be explained in detail in Part II. Central measures in this context include established translation procedures as suggested by Harkness (2008) or Survey Research Center (2010) and a focus on an extensive cognitive pretesting (Karabenick et al. 2007).

3.2.2 Selection of Countries for Comparison: Germany and the USA

Hantrais (2009) emphasizes the importance of selecting appropriate objects of inquiry, which can be transferred to the selection of countries to be compared. A number of related research works focus on Germany and the USA in different contexts (e.g., Grafe 2011; Blömeke and Paine 2008; König et al. 2011; LeTendre et al. 2001; Brückner et al. 2015), which evokes the impression that Germany and the USA are appropriate objects for a respective analysis. It can be observed in related research that such a selection of countries for international comparative analyses is not always justified or discussed (e.g., Clarke et al. 2006; Merz-Atalik, Beuse, and OBrien 2016). Yet, it is essential to look at the comparability of two presumably appropriate countries in detail before designing a comparative study.

Numerous differences distinguish teacher education programs in Germany and the USA, for example, with regards to systemic and organizational structures. On a systemic level, preservice teachers in most US states can acquire their teaching license after completing a Bachelor's degree with coursework in their subjects, pedagogy and teaching methods and a practicum or student teaching experience (Ries, Yanes Cabrera, and González Carriedo 2016). German preservice teachers are required to fulfill an academic phase of three and a half to five years at universities. It includes subject studies, subject-didactic studies and general educational studies as well as internships with a duration of several weeks or sometimes a whole semester. Finally, they achieve, depending on the state, either a Bachelor's and a Master's degree or an equivalent *Staatsexamen* and then have to complete an inservice training phase of one and a half to two years, which is organized and mentored by the state's education authority and independent from universities (Cortina and Thames 2013; Kammerl and Mayrberger 2011). According to Blömeke and Paine (2008), professional development and inservice education are emphasized and rewarded in the USA. In Germany, binding obligations for continuing professional development are handled individually by the German federal states but generally rather neglected. Consequently, professional development and inservice education rely on personal interest and motivation of the teachers (cf. also Blömeke 2009). With regards to organizational aspects of study programs, US preservice teachers are organized in years or cohort groups and taught according to pre-set schedules for which the institutions are responsible. Especially in undergraduate courses, there are but few options for selection. German preservice teachers, on the other hand, have a smaller number of obligatory courses and choose several electives from a selection offered by the institution. Within a framework of compulsory requirements depending on the local system and structure of teacher education, preservice teachers organize their own schedules individually. On the level of contents, general pedagogical knowledge is an illustrative example of a content area which plays a clearly different role in both systems of teacher education. It is distinguished, emphasized and structurally

established as an own important content area in German programs but integrated to a varying degree into other areas, such as educational foundations or generic methods/instructional design courses, in the USA (Blömeke and Paine 2008).

Despite these and several further differences in the organization of teacher education, Germany and the USA also share certain characteristics. Examples relevant to the context of this dissertation include, for example, cultural backgrounds, systemic organization of teacher education and pedagogical discourses in general. To start with, it is valuable to pay attention to cultural backgrounds. There are, of course, considerable differences and peculiarities with each of them, the complexity of which eludes a detailed comparison at this point. Yet on a basic level, they can both be summarized as Western countries with essential basic assumptions about democracy, human rights, the role of education, and further related aspects. Trivial as this may seem, it is yet important to acknowledge against the background of the issues of translation and of different terminology and of underlying concepts as described above, which can be expected to even increase if the common ground of two cultures has less substance. In addition to this, with regards to teacher education, both countries show systemic resemblance on a level superordinate to the organizational differences pointed out above. Teacher education is a task of higher education institutions, requires according entry requirements and results in a degree and teaching license. In both countries, the organization of initial teacher education is widely subject to the states or *Bundesländer*, with restricted influence of the federal government.

Also, with regards to the pedagogical discourse, there are noteworthy similarities. As Blömeke and Paine (2008) point out, both countries share a “strong sense of the need for and contentious debates about the possibilities of reform of teacher education” (p. 2028), which have led to an increased awareness of the importance of teacher education and continuing reform efforts (cf. also Cochran-Smith 2009). The related pedagogical discourses were described to have run largely independent from each other in the past, with increasing efforts for connection and exchange especially on the German side (Grafe 2011). There are also significant overlaps and connections between the two with regards to certain concepts of interest for the topic of this dissertation, which will be explored in greater detail in Part I.

Overall, the literature-based consideration of similarities and differences and methodological challenges lead to the conclusion that Germany and the USA offer a valid basis for the aspired comparison. While the focus of this work necessarily has to be restricted to a selection of countries to allow for a deep and concentrated analysis, the perspective will be widened in suitable contexts to take into account the developments of countries beyond Germany and the USA by further comparisons and references. It will be desirable in future studies to extend the results achieved in this work to further contexts and to substantiate the perspective achieved by further countries, cultures, and analyses.

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