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**In the intersections between media and education:
Teachers' practices and factors associated with developing
students' media literacy in secondary schools**

Doctoral Dissertation for the Degree Doctor philosophiae

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At this point, when I present this doctoral dissertation, I am pleased to contemplate the process I have been through. It was challenging, sometimes uncomfortable. It raised questions, doubts, and insecurities. But, concurrently, there was so much learning and development. I am glad to think of how I started and realize how much I could acquire and evolve in several aspects.

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Abstract

The Grünwald Declaration on Media Education from 1983 is considered the first formal call for universal media education. Since then, media education and related concepts have received innumerable contributions from scholars, practitioners, and policy-makers. Policies and guidelines at different levels officially involve schools in promoting media education. In this regard, the responsibility for putting media education initiatives and guidelines into practice is mainly on the teachers. However, little is known about under what circumstances young people tend to rely on teachers to develop media competencies and how the variance in teachers' engagement in media education can be explained.

Therefore, in three studies, the present work seeks to verify what factors are associated with students' learning of media-related aspects from teachers and teachers' efforts in developing students' media-related competencies. The framework adopted in the empirical work consists of three main aspects. First, it refers to concepts of media pedagogy and educommunication to address teachers' practices involving media. These practices correspond to the interplay of fostering students' media competencies with using media use for instruction and mediating students' media use. Second, it addresses the variety of media-related competencies prescribed in media and digital literacy guidelines. Finally, based on previous research in the field, the framework includes contextual and individual characteristics as influencing factors of media education practices.

The first study approaches teachers' role as media educators. This study explores the characteristics of students, schools, and countries that are associated with the incidence of learning computer and information competencies primarily from teachers. Therefore, data from 14 participant countries in the 2013 International Computer and Information Literacy Study were analyzed with a three-level regression model. The findings show that the most significant predictors are at the individual's level, as gender, access to ICTs at home, parental socioeconomic conditions, and self-efficacy concerning ICT yield positive associations with recognizing teachers as primary digital mentors. The schools' characteristics do not show significant associations. At the country level, ICT Development Index associates negatively and significantly with students' relying on teachers to develop computer and information competencies.

The second study focuses on content taught in media education at school, accounting for the comprehensiveness of topics and competencies that are part of media literacy frameworks. The goal is to identify aspects that favor and disfavor teachers' practice of media education integrated into traditional school subjects. With linear regression analysis, models including teachers' and schools' characteristics are tested to predict the fostering of different areas of media competence and the mediation of opportunities and risks in students' media use. Therefore, data collected from secondary teachers in the Thuringia State, Germany, in a project in which the author was involved were analyzed. The series of analyses conducted reflect the process of model development. Considering all models tested to predict teaching of different areas of media competence, the positive and strong associations with ICT use and perceived importance of the competence area are a constant. However, how teachers evaluate the ICT available at their school does not usually play a role. Moreover, it became clear that media education has less room in Gymnasium schools than in other school types, and most competence areas tend to be fostered in non-STEM subjects.

The third study addresses the use of ICTs to foster students' media-related competencies. The associations between teaching with and teaching about media in the data collected from teachers in Thuringia are tested through exploratory structural equation modeling. Therefore, the fostering of different media competence areas and the use of various types of ICT are considered. Moreover, their associations are tested, controlling for schools' and teachers' traits. The results show that teachers' use of computer laboratories and basic computer programs with their students predicts all four competence areas positively and strongly. The use of mobile devices and online applications in class yield significant associations with fostering information competence. Conversely, using presentation and visualization ICTs does not seem to be involved in activities promoting media literacy. The effects of training, collaboration, and satisfaction with the school's ICT observed in the regression analyses of the second study are confirmed.

The findings presented can contribute to refining the discussions about media education in the academic, political, and educational spheres. To consolidate media education in schools, it is pertinent to consider teachers' different practices involving media, the several dimensions of media literacy competences, and the variety of ICTs that may be used in classes. These dimensions should be integrated into teachers' training so that they get solid preparation to practice media education and develop an awareness of the extent of their role as media educators.

Zusammenfassung

Die "Grünwald Declaration on Media Education" aus dem Jahr 1983 gilt als der erste offizielle Aufruf für eine allgemeine Medienbildung. Seitdem haben Wissenschaftler:innen, Praktiker:innen und politische Entscheidungsträger:innen eine Vielzahl an Beiträgen zur Medienbildung und zu angrenzenden Konzepten veröffentlicht. Politische Maßnahmen und Richtlinien auf verschiedenen Ebenen beziehen sich auf die Schulen als wesentlichen Akteur für die Förderung der Medienbildung. Die Verantwortung für die praktische Umsetzung der medienpädagogischen Initiativen und Leitlinien liegt weitgehend bei den Lehrkräften. Es ist jedoch wenig darüber bekannt, unter welchen Umständen junge Menschen bei der Entwicklung von Medienkompetenzen besonders auf die Lehrer:innen angewiesen sind, und wie die Unterschiede im Engagement der Lehrer hinsichtlich ihres Engagement in der Medienerziehung erklärt werden können.

Daher wurde in der vorliegenden Arbeit in einer Abfolge von drei Studien überprüft, welche Faktoren mit dem Vermitteln von medienbezogenen Aspekten durch die Lehrkräfte und den Bemühungen der Lehrkräfte um die Entwicklung der medienbezogenen Kompetenzen der Schüler verbunden sind. Der in dem Forschungsvorhaben entwickelte theoretische Rahmen besteht aus drei Hauptaspekten: Erstens bezieht er sich auf Konzepte der Medienpädagogik und der "Educommunication", um die Praktiken der Lehrkräfte im Umgang mit Medien zu untersuchen. Diese Praktiken beziehen sich auf das Zusammenspiel zwischen der Förderung der Medienkompetenz der Schüler:innen, der Nutzung von Medien im Unterricht und der Mediation der Mediennutzung der Schüler:innen durch die Lehrenden. Zweitens geht es um die Rolle der unterschiedlichen medienbezogenen Kompetenzen in der Unterrichtspraxis, die in den Richtlinien zu digitalen Kompetenzen und Medienkompetenzen festgeschrieben sind. Schließlich werden auf der Grundlage früherer Forschungsarbeiten auf diesem Gebiet kontextuelle und individuelle Merkmale als Einflussfaktoren für medienpädagogische Praktiken identifiziert und in den Analysen berücksichtigt.

Die erste Studie befasst sich mit der Rolle der Lehrer:innen als Medienerzieher:innen. In dieser Studie werden die Merkmale von Schülern und Schülerinnen, Schulen und Ländern untersucht, die mit der Häufigkeit des Vermittelns von Computer- und Information-

skompetenzen durch Lehrkräfte in Verbindung stehen. Zu diesem Zweck wurden die Daten von Schülerinnen und Schülern aus 14 Teilnehmerländern der International Computer and Information Literacy Study 2013 mit einem drei-Ebenen-Regressionsmodell analysiert. Die Ergebnisse zeigen, dass die meisten signifikanten Prädiktoren auf individueller Ebene liegen. Geschlecht, Zugang zu Informations- und Kommunikationstechnologie (IuK) zu Hause, sozioökonomische Bedingungen der Eltern und Selbstwirksamkeit in Bezug auf IuK stehen im Zusammenhang mit der Nennung von Lehrenden als primäre digitale Mentoren. Die Merkmale der Schulen erweisen sich nicht als bedeutsam. Auf Länderebene steht der IuK-Entwicklungsindex in einem negativen und signifikanten Zusammenhang mit der Tatsache, dass sich die Schüler:innen bei der Entwicklung von Computer- und Informationskompetenzen auf Lehrer:innen verlassen.

Die zweite Studie widmet sich den Inhalten, die im Rahmen der Medienerziehung in den Schulen vermittelt werden, wobei die berücksichtigten Themen und Kompetenzen aus den Rahmenplänen für Medienkompetenz abgeleitet wurden. Ziel ist es, Faktoren zu identifizieren, die die Integration von Medienbildung in die traditionellen Schulfächer durch die Lehrkräfte begünstigen bzw. benachteiligen. Mittels einer linearen Regressionsanalyse werden Modelle getestet, die Merkmale von Lehrkräften und Schulen einbeziehen, um die Förderung verschiedener Bereiche der Medienkompetenz und die Mediation von Chancen und Risiken bei der Mediennutzung von Schülern und Schülerinnen vorherzusagen.

Dazu wurden Befragungsdaten von Lehrkräften der Sekundarstufe in Thüringen analysiert, die im Rahmen eines Projekts, an dem die Autorin beteiligt war, erhoben wurden. Die durchgeführten Analyseserien verdeutlichen den Prozess der Modellentwicklung. In allen getesteten Modellen zur Vorhersage der Unterrichtspraxis bei der Vermittlung verschiedener Bereiche der Medienkompetenz lassen sich starke positive Zusammenhänge mit der IuK-Nutzung und der wahrgenommenen Bedeutung des Kompetenzbereichs feststellen. Wie die Lehrkräfte die Qualität der an ihrer Schule verfügbaren IuK bewerten, spielt jedoch in der Regel keine Rolle. Darüber hinaus wurde deutlich, dass die Medienbildung in Gymnasien weniger Raum einnimmt als in anderen Schultypen und die meisten Kompetenzbereiche eher im Bereich der nichttechnischen Fächer gefördert werden.

Die dritte Studie befasst sich mit dem Einsatz von IuK zur Förderung der medienbezogenen Kompetenzen von Schülern und Schülerinnen. Die Zusammenhänge zwischen dem Unterricht mit und dem Unterricht über Medien werden durch explorative Strukturgleichungsmodellierung der Thüringer Daten getestet. Dabei werden die Förderung verschiedener Medienkompetenzbereiche und der Einsatz verschiedener Arten von IuK berücksichtigt und die Zusammenhänge zwischen ihnen unter Kontrolle von

Schul- und Lehrermerkmalen getestet. Die Ergebnisse zeigen, dass die Nutzung von Computertechnik durch die Lehrkräfte auf die Förderung aller vier Kompetenzbereiche starke positive Auswirkungen hat. Die Verwendung von mobilen Geräten und Online-Anwendungen im Unterricht durch die Lehrkräfte steht in signifikantem Zusammenhang mit der Förderung der Informationskompetenz. Hingegen ist der Einsatz von Präsentations- und Visualisierungs-Technik nicht in Aktivitäten zur Förderung der Medienkompetenz involviert.

Die vorgestellten Ergebnisse können dazu beitragen, die akademische, politische und pädagogische Diskussionen über Medienbildung weiterzuentwickeln. Die Arbeit macht darauf aufmerksam, dass es wichtig ist, die unterschiedlichen Praktiken der Lehrkräfte im Umgang mit Medien, die verschiedenen Dimensionen der Medienkompetenz und die Vielfalt der Technik, die im Unterricht eingesetzt werden können, nicht nur in den Analysen zu berücksichtigen, sondern auch in der Unterrichtspraxis zu stärken. Diese Dimensionen sollten auch in die Aus- und Fortbildung der Lehrkräfte integriert werden, damit sie eine solide Vorbereitung auf die Medienbildung erhalten und ein Bewusstsein für das Ausmaß ihrer Rolle als Medienelehr:innen entwickeln.

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Abbreviations

CCM Curriculum content mapping

CFA Confirmation factor analysis

CIL Computer and information literacy

EACEA Education, Audiovisual and Culture Executive Agency

EAVI European Association for Viewers Interests

EFA Exploratory factor analysis

EMEDUS European Media Literacy Education Study

ESEM Exploratory structural equation modeling

EU European Union

ICILS International Computer and Information Literacy Study

ICT Information and communication technology

IEA International Association for the Evaluation of Educational Achievement

KMK Kultusministerkonferenz

LKM Länderkonferenz Medienbildung

LR Likelihood ratio

MIL Media and information literacy

MPM Media Pluralism Monitor

OECD Organization for Economic Cooperation and Development

SEM Structural equation modeling

STEM Science, technology, engineering, and mathematics

TCDSIL Teachers' competence in developing students' information literacy

TMBJS Thüringer Ministerium für Bildung, Jugend und Sport

UNESCO United Nations Educational, Scientific and Cultural Organization

Glossary of Terms in German

Abitur is the exam that counts for admission in higher education programs.

Deutscher Städtetag is the committee of representatives of cities in Germany.

DigitalPakt Schule is a policy by the German Federal Ministry of Education that aims to boost schools' digitalization by allocating federal funds for schools to invest in digital infrastructure.

Förderschule is a type of school for students with special needs.

Gemeinschaftsschule is a type of school that may offer grades 1–12 or 5–12.

Gesamtschule is a type of school in which students can complete their studies after the 9th, 10th, or 13th grade.

Gymnasium is a type of secondary school that has emphasis on students' preparation for academic studies in the 11th and 12th grades, strongly oriented by the exams that count for admission in higher education programs.

Kultusministerkonferenz is the German Conference of Ministries of Educational and Cultural Affairs.

Kursplan Medienkunde is the media literacy framework for secondary schools in the state of Thuringia.

Länder are the federal states in Germany.

Länderkonferenz Medienbildung is the association of the German states' representatives of the media centers and media departments of pedagogical institutions.

Medienkompetenz means literally media competence and is the equivalent term to designate media literacy in the German language.

Medienpädagogik is a discipline dedicated to media-related issues applicable to education.

Regelschule is a type of secondary school that offers until the 9th or 10th grade, whose certificate may qualify students to pursue vocational training or complement their secondary school at a Gymnasium.

Schulämter are the regional offices responsible for the support and supervision of services delivered by schools.

Schulträger is the organ responsible for the infrastructural maintenance of a school.

Thüringer Ministerium für Bildung Jugend und Sport is the Ministry of Education, Youth and Sports in Thuringia.

Chapter 1

Introduction

In 1982, researchers and practitioners in the fields of education and communication gathered in an international symposium held in the Federal Republic of Germany to discuss the relations between the two areas: education and communication. The result was the publication of a document that highlights:

1. “The power of media”, advocating for the recognition of the role that media play in the development of individuals and society. For this reason, educational systems should have the obligation of preparing individuals to critically understand communication phenomena.
2. The insufficient efforts of formal education in “media education or education for communication”, accusing school approaches to media and communications to be very far from peoples’ experiences.
3. The responsibility of the school, shared with the family, in preparing children and youth to live in a world densely permeated by media of all kinds.
4. The necessity of aiming at literacy in image, word and sound systems, which would demand the revision of educational priorities.

The document, known as “The Grünwald Declaration on Media Education” (1983), requests the creation of media education programs in all formal education levels. These should be accompanied by adequate training of teachers to instruct on media-related matters, and research on practices and results.

While the Grünwald Declaration cannot be considered the beginning of media education — since the appeals to educate in relation to the media are practically as old as the media themselves — it is considered the first formal call for universal media education (Yildiz, 2019). Moreover, the document structures key elements that consolidate the concept of media education at the international level.

The first key conceptual element refers to the content of media education. Here, the Grünwald Declaration makes two salient points: it appeals to propagate the understanding of communication phenomena, and disputes the notion of literacy and the emphasis of educational systems on reading and writing (points 1 and 4 listed above). When the communication phenomena are put in the center, the perspective differs from a long tradition of media education that consisted of cultivating the use of “the correct media”. This is the case, for instance, of the protective approach, which is considered the roots of media education and the main paradigm adopted for a long time. Its aim is protecting children and adolescents from the potential harm that the exposure to (“wrong”) media content might cause and at the same time, familiarizing youngsters with media products that are considered valuable (Leaning, 2017; Tulodziecki & Grafe, 2013).

Instead of cultivating the consumption of specific media, the Grünwald Declaration calls upon the development of critical thinking on the communication phenomena, which is a substantially broader, deeper, more ambitious and challenging goal. First, by emphasizing the development of critical thinking, the judgement of what is good or bad in media is shifted to individuals’ agency. The goal is no longer presenting individuals with a list of what should be consumed and what should be avoided, but instead, training individuals to be capable to make such judgements by themselves. In addition, the objects of studies of communication and media sciences — the processes and mechanisms infused in the communication components, i.e., communicator, content, medium, recipient, and effects — get to be considered useful knowledge for forming citizens. Besides, when Grünwald urges for a revision of the notion of literacy, it can be understood that media and communication phenomena should not be mere topics of instruction, but that individuals should develop several capabilities to deal with media, make sense of and take part in communication processes.

Grünwald calls attention to the role that media play in society and individuals’ lives, arguing that formal education cannot ignore such relevance. Therefore, the second pillar of the concept of media education that can be taken from the Grünwald Declaration is the space given to media in school. Referring to media education at the beginning of the 1980s, Grünwald stated that the efforts that schools dedicated to media education were too little and that the media experiences of students in school were dramatically different from the one they had outside the school. Over three decades later, scholars affirm and evaluation studies point out that the place of media education in schools is not fully established yet (Hartai, 2014; Livingstone, 2011; Tulodziecki & Grafe, 2019). Additionally, an accentuated difference between youth’s private media environments and the media use in school remains an issue in the first decades of the 21st century. Even though media are present in schools, frequently its use is incompatible with the habits and

interests of youth, especially related to online and digital resources (Buckingham, 2007b; Gutiérrez Martín & Tyner, 2012; Lim et al., 2013). Such discrepancy would prevent schools from playing a strong role in youth's media education since they would have better opportunities to have contact with information and communication technologies (ICTs) out of school (Gutiérrez Martín & Tyner, 2012).

This brings to the third key point in the Grünwald Declaration: the role of the school in the education of young people on media matters. Within the protective approach, the responsibility for educating children on the risks of media has been frequently attributed to parents (Buckingham, 1996; Hogan, 2001). However, when media education turns to the direction of media literacy, the school curriculum comes into focus. As attending school, at least for some years, is mandatory in many countries, media education at school is considered the best possibility to offer children the chance to get acquainted with technologies and reach a minimum standard of media literacy, independently from socioeconomic status and other differences (Buckingham, 2007a; de Haan & Livingstone, 2009). Despite these arguments, the actual impact of teachers' interventions on children and adolescents' media use and related skills is sometimes challenged in face of the role that other influencing agents play, such as family and peers (Livingstone et al., 2011), and what youngsters learn and develop autonomously (Kalmus, 2013).

After the Grünwald Declaration, media education and related concepts have received many contributions by scholars, practitioners, and policy-makers. The spread of digital media and ICTs — and the array of phenomena that it relates to — has particularly made explicit the demand for education about media of all formats. Currently, the promotion of media and related literacies is supported, encouraged and endorsed by international educational organs and governmental policies in several countries and regions. For instance, the United Nations Educational, Scientific and Cultural Organization (UNESCO) highlights that all citizens should have the opportunity to develop media and related literacies, and for this reason, media aspects must have space in formal education. UNESCO especially underlines the role of teachers in promoting media-related literacies and contributing to the empowerment of young citizens and insists on the integration of media literacy in formal teacher training (Wilson et al., 2011).

As UNESCO media education guidelines constitute the foundation for European Union (EU) media literacy standards (Pérez Tornero & Durán Becerra, 2019), the EU also supports the universality of media and digital literacies. In its recent political guidelines, the European Commission refers to digital education as both the use of ICTs for instruction and the fostering of students' digital competences, setting digital education as a strategic priority (European Commission, 2020). While each EU member state is responsible for organizing its education system and teaching content, the EU understands its role

in strengthening media education on the continent by providing common frameworks, enabling exchanges of best practices, and supporting research and evidence sharing (European Commission, 2020).

In the case of Germany, educational policies are under the responsibility of the federal states — the “*Länder*”. However, the Conference of Ministries of Educational and Cultural Affairs (KMK — *Kultusministerkonferenz*) issues important educational standards for the states. The KMK formulates media education as a compulsory task of schools, and determines that it comprises learning with media and learning about media (Kultusministerkonferenz, 2012). In this context, the KMK strategies for media and digital education emphasize the crucial role of teachers in using media competently in the subjects they teach and foster students’ media competence (Kultusministerkonferenz, 2017). In addition, the *Länderkonferenz Medienbildung* (LKM), which is an association of the states’ representatives of the media centers and media departments of pedagogical institutions, contributes with guidelines for schools’ media education. It affirms that a compulsory, systematic and comprehensive media education is an indispensable part of the school’s responsibility (Länderkonferenz Medienbildung, 2015).

Based on international (e.g., UNESCO), European, and especially national guidelines, the *Länder* should develop their media education plans. Taking the example of Thuringia State, where part of the data analyzed in the dissertation were collected, the state has started early with a structured plan for schools to implement media education. The implementation of a media literacy teaching plan — the “*Kursplan Medienkunde*” — started in 2002 to be taught in the school years 5 to 7 (Thüringer Schulportal, n.d.). An update of the plan came in 2009, targeting the classes 5 to 10 (Thüringer Ministerium für Bildung, Wissenschaft und Kultur, 2009). In 2017, a teaching plan for primary schools (classes 1 to 4) was launched (Thüringer Ministerium für Bildung, Jugend und Sport, 2017).

These policies and guidelines at different levels officially involve schools in the promotion of media education. Nevertheless, schools are not expected to carry exclusive responsibility. The role of the family is considered fundamental in the media education process, especially in the childhood. Moreover, peers, informal education institutions, and autonomous experience are also recognized as influential in children and adolescents’ media use and skills. In the face of the various media education agents and opportunities, it is unclear what children learn in relation to media in formal and informal education environments, and consequently, what contributions of the school are most relevant to children and adolescents’ media literacy (Buckingham et al., 2005; Gutiérrez Martín & Tyner, 2012).

While the relevance and necessity of media education in schools is recognized and established in policies, guidelines, and recommendations at different levels, the respon-

sibility of putting it into practice and making it actually happen lies to a large extent on teachers (Brüggemann, 2013; Dias-Fonseca & Potter, 2016). Therefore, what happens in the realm of media education in schools might vary considerably. Although they are oriented by the same regional and national guidelines, media education practices depend on teachers' and school administration initiatives, which in turn, are conditioned by specific contexts and resources that may favor or hinder the promotion of media education. In addition, media literacy frameworks are usually ambitious (Livingstone, 2011). Especially when school curricula do not have a specific subject dedicated to media education, it is unrealistic to expect that teachers will cover all the competence areas proposed in media education frameworks. Therefore, it is pertinent to understand which media competence areas are taught by teachers under what circumstances.

Since Grünwald, the variety and quantity of media in schools has increased immensely. ICTs have a substantial market in the education sector. With a higher penetration of media technologies in schools, using media for instruction becomes a regular component of teaching practice and sometimes, may be considered a synonym for media education. While the broadness of the term "media education" accommodates different intersections between media and education, at some points, the particularities of the practices of teaching with media and teaching about media might be ignored. As a consequence, a naïve and deceiving expectation may occur in which the presence of ICTs in schools is a sign that students are receiving instruction regarding media.

Inspired by these issues, the work presented here refers to the pillars of the media education concept laid out by Grünwald to gain understanding about the media education practices of schools. In a series of studies (Table 1.1), the work addresses media education in schools in terms of contents taught, the uses of media for teaching about media, teachers' role as media educator, and the conditions under which media education happens.

The first study approaches the school's role as media educator. This study explores the characteristics of students, schools, and countries that are associated with the incidence of learning computer and information competencies primarily from teachers. Therefore, data from 14 participant countries of the 2013 International Computer and Information Literacy Study (ICILS) were analyzed with a three-level regression model. The study has been published as follows (open access):

Berger, P. (2019). Who needs teachers? Factors associated with learning ICT skills from teachers in a multilevel analysis of the ICILS data. *MedienPädagogik*, 35, 116–135.
<https://doi.org/10.21240/mpaed/35/2019.10.22.X>

The second study is dedicated to the topic of content taught in the realm of media education at school, accounting for the comprehensiveness of topics and competencies

Table 1.1: Overview of the studies of the dissertation

Study	Research question	Focus	Methods
1	What aspects are associated with the learning of media and digital skills primarily from teachers?	Aspects of the country, school and personal levels associated with learning ICT competences from teachers	Survey; secondary analysis; ICILS data; students' data; multilevel hierarchical regression
2	What aspects are associated with the teaching of media and digital skills in schools?	Aspects that favor and disfavor teachers' practice of fostering students' skills in different areas of media literacy	Survey; secondary schools in Thuringia; teachers' data; principal component analysis; linear regression
3	To what extent is the use of specific information and communication technologies associated with the fostering of specific media-related competences?	Associations between teachers' use of different ICT types and the fostering of specific areas of media literacy	Survey; secondary schools in Thuringia; teachers' data; exploratory structural equation modeling

that media literacy frameworks consist of. The goal is identifying aspects that favor and disfavor teachers' practice of media education integrated in traditional school subjects. By means of linear regression analysis, models including teachers' and schools' characteristics are tested to predict the fostering of different areas of media competence and the mediation of opportunities and risks in students' media use. For this, data collected from secondary teachers in Thuringia in a project in which the author was involved were analyzed. The studies correspond to the following publications (open access):

Berger, P., & Wolling, J. (2019). They need more than technology-equipped schools: Teachers' practice of fostering students' digital protective skills. *Media and Communication*, 7(2), 137–147. <https://doi.org/10.17645/mac.v7i2.1902>

Berger, P. (2021). Influencing factors on teaching different facets of media and digital literacy. In M. Seifert & S. Jöckel (Eds.), *Bildung, Wissen und Kompetenz(-en) in digitalen Medien: Was können, wollen und sollen wir über digital vernetzte Kommunikation wissen?* (pp. 105–118). <https://doi.org/10.48541/dcr.v8.6>

Berger, P. (2020). Teachers' mediation practice: Opportunities and risks for youth media behavior. *Comunicar*, 64, 47–56. <https://doi.org/10.3916/C64-2020-05>

Finally, the last study addresses the use of ICTs to foster students' media-related competencies. The associations between teaching with and teaching about media in the data collected from teachers in Thuringia are tested through exploratory structural equation modeling. Therefore, the fostering of different media competence areas and the use of various types of ICT are taken into account and the associations between them are tested,

while controlling for schools' and teachers' traits. The respective journal article has been published as follows (open access):

Berger, P. (2021). ICT use for teaching media literacy: A closer look at the relationships between teaching with and teaching about media. *Media Literacy and Academic Research*, 4(2), 6–24. <https://bit.ly/berger-mlar>

Chapter overview

The dissertation consists of the five open access published research articles mentioned above and the summary presented in the subsequent chapters. The following chapter defines terms and presents the theoretical concepts adopted in the work. The third chapter presents policies and frameworks that are relevant for the media education practices in the region studied. In Chapter 4, relevant studies on the topics approached in this work are reviewed. Chapter 5 is dedicated to the empirical work conducted in the dissertation, where the research model based on the elements introduced in the first chapters, the objectives, methods and main findings of the studies are presented. The sixth chapter discusses the work developed, in terms of possible implications of the findings for the media education practice, policies and research.

Chapter 2

Media and education: Theories and concepts on their intersections

The concepts of “media” and “education” can be approached in a variety of ways. Likewise, multiple aspects can be observed when addressing how the two concepts relate to each other. Therefore, the following sections present and define the perspectives on media, education and their intersections adopted throughout this work.

2.1 What to understand by media and technology in education

Media in the context of education may refer to a vast range of outlets, institutions, types of content and information, as well as to technologies such as equipment, devices and applications. In fact, teaching and learning involve communication processes, as Kaplún (1999) points out: communication is a component of pedagogy. Therefore, some type of medium is usually involved in educational processes (Qvortrup, 2007), be it the language, the didactic book, the blackboard, or digital resources accessed with mobile devices.

However, contemporary references to media in education predominantly mean information and communication technology (ICT), which “refers to all technologies used for processing information and communicating” (Voogt & Knezek, 2008, p. xxix), involving both hardware and software applications (Anderson, 2008). Ranieri (2019) also advocates for treating ICT as media since “the media increasingly combine different modes of communication and operate through multiple technological platforms” (p. 638). In the face of these considerations, speaking of “technologies” might sound more objective than “media”. However, it would be simplistic to refer to technologies and run the risk that the vast content, media products, and communication platforms provided by media

institutions as well as individuals and organizations to which they enable access are ignored (UNESCO, 2013). Therefore, Aguaded and Delgado-Ponce (2019) point out that the term “media” is considered the best to encompass such convergence and integration of information, traditional media, digital technologies, and other elements.

In addition, the designations “ICT”, “media” and “technology” are frequently combined with qualifying terms such as “digital”, “twenty-first century” and “new”, in an attempt to complement and specify their meaning. For instance, Male and Burden (2014) refer to “twenty-first-century technology in schools” as equipment with access to the internet and capable of running interactive tools and applications, which include portable digital devices. In summary, the objects “media” and “technologies” in contemporary education can hardly be completely distinguished. Consequently, the terms are frequently used interchangeably. They may refer to devices, applications, platforms, services, and contents, usually encompassing the elements related to the internet and interaction.

Nevertheless, to understand media in education, it is necessary to go beyond the terminology that designates the objects “media” and “technologies”. It is essential to identify where and with what functions these objects are located in educational processes. At this point, it is worth turning to disciplines that focus on the confluences of the fields of education and communication.

2.2 Theoretical constructs on media and education

Relevant references in the intersections between the education and communication sciences are the disciplines of media pedagogy, which has a long tradition, especially in German speaking countries [*Medienpädagogik*], and educommunication, developed and more disseminated in Latin America [*Educomunicación/Educomunicação*].

Media pedagogy, according to Herzig (2012) and Tulodziecki (2011), comprehends all media-related issues of relevance and potentially applicable to education, including normative, empirical, and theoretical principles of teaching and learning, media, technology, socialization, and education. Herzig (2012) highlights two aspects that are the subject of research in the field. The first is media didactics, concerned with how media and media products can or should be employed to reach pedagogical goals. The second is the theory of media-related educational tasks, which refers to what media-related pedagogical goals should be pursued and how they can be achieved.

As for educommunication, it is understood as the field that is created when education and communication meet (Aguaded & Delgado-Ponce, 2019; Soares, 2014). The fundamental consideration of educommunication is that education happens through a communication process. This consideration is strongly based on the premises of dialogical

education by Freire (2011), who advocates for pedagogical processes that value and incorporate the students' experiences, perspectives, and knowledge. From this perspective, a central emphasis of educommunication is creating and strengthening communication environments in educational spaces, fostering horizontal communication between the actors involved in the educational space and situation (Soares, 2002). In this context, the use of media plays a role in mediating such communication environments in education, as it is understood that media channels, platforms and formats represent opportunities of communication. In addition, integrating the systematic studies of communication processes in educational practices becomes relevant, so that students can deal with the media they use in and out of educational situations in a positive way: "educommunication means knowledge of how media function, how they create meaning, how they are organized and construct reality, and how those who are media recipients understand this reality" (Aguaded & Delgado-Ponce, 2019, p. 408). Soares (2014) summarizes that educommunication "values media and includes its analyses and uses as a methodological procedure, but goes beyond media in its purposes and goals" (p. 18).

These delineations of media pedagogy and educommunication indicate how broad the field that addresses questions of common interest of communication and education can be. The intention here is not confronting the two disciplines or reducing them to synonyms, since both have their own traditions, references, and foundations. The point of interest is that, in being disciplines that combine communication and education affairs, they share similar views on aspects that illustrate this confluence. Although neither of the disciplines presents rigid definitions or models of where media are placed in education, it is possible to identify within their scope some intersection points of media and education. Considering the focus of this work in formal education, more specifically schools, three main intersections are meaningful. Among the variety of terms that can be used to refer to these three aspects, the designations pointed out by Qvortrup (2007) are particularly clear in expressing how and where media and education intersect: education about media, education within the context of media and media society, and education with media. Figure 2.1 represents this triad.

The first intersection (A) — education about media — lies in the pedagogical goals of developing media-related competence. In this case, media aspects and related phenomena are the content of the instruction. Education about media corresponds to the teaching about topics addressing basic interests of communication science, such as what are media, how do they work, what are their purpose, what can they be used for, and their implications and effects for the individual and society (Citelli, 2010). The inclusion of media training in schools was initially motivated by efforts to protect children and youth from potential harm that media use may cause. With the development of media technologies

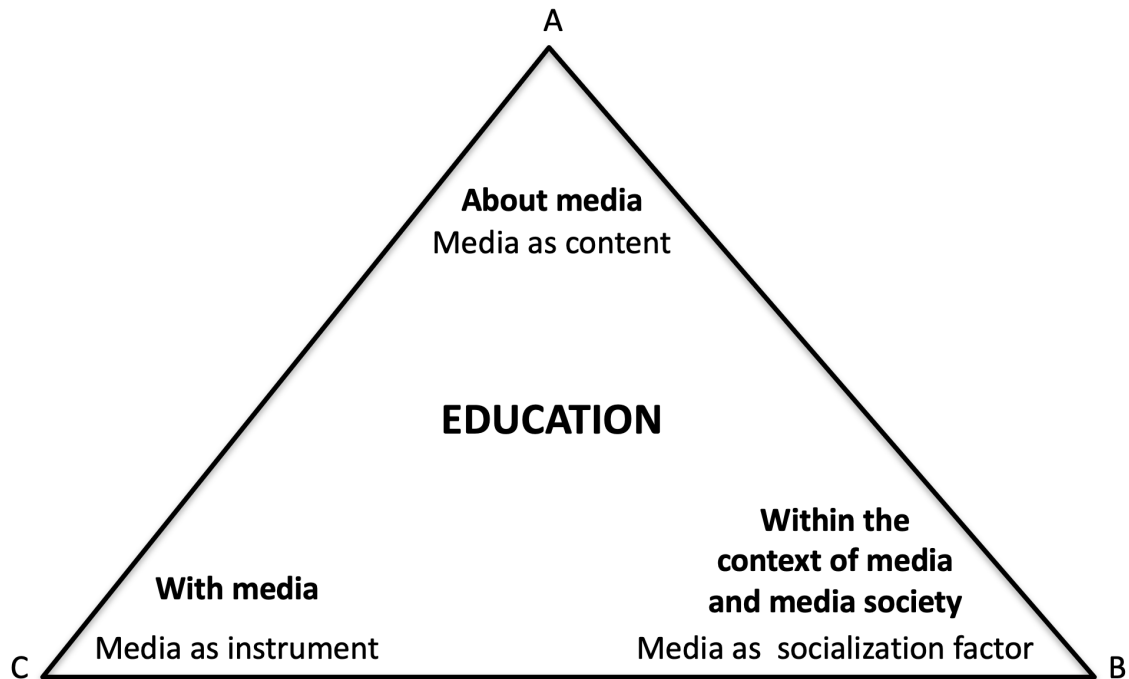


Figure 2.1: Media pedagogy and educommunication: Intersections between media and education (author's illustration)

and their penetration in diverse spheres of society, an understanding emerged that in addition to instructing youth to use media safely and responsibly, it is necessary to prepare and encourage them to actively participate and seize the opportunities in a densely mediated world (Tulodziecki & Grafe, 2013). Teaching about media is frequently referred to as promoting media education and fostering media-related literacies.

Education within the context of media and media society (B) considers media as a socialization factor (Tulodziecki, 2013). In this intersection, media are recognized as a cultural element that play a role in individuals' development for becoming social and taking part in society, independently from formal educational processes. It is understood that the contents that media carry and the media themselves are responsible for some socialization effects (Aufenanger, 2008). Therefore, they play a part in the upbringing of individuals by influencing the shaping of values, world views, preferences, and behaviors.

The intersection education with media (C) concerns questions about why and how media and ICTs can be used and be part of the educational environment (Citelli, 2010). This aspect is of interest to the sphere of communication science especially regarding media use questions, i.e., descriptions of media use episodes and patterns in educational environments, or media evaluations as well as their explanations in relation to pertinent factors (Schweiger, 2007). According to Qvortrup (2007), media in education "are used in order to make it more probable that the educational communication has the premeditated

effect” (p.9). The “premeditated effect” indicates that in education science’s perspective, the use of a medium happens in relation to a pedagogical goal, which is referred to as media didactics. Examples of pedagogical goals in media didactics are increasing the attractiveness of how contents and activities are presented to capture students’ attention and using resources whose features can enhance students’ understanding of contents (Chou et al., 2019; Delić-Zimić & Gadžo, 2018; Ndlovu et al., 2020; Qvortrup, 2007). This intersection accommodates frequent research terms such as “educational media” and “ICT integration”. In this intersection, media are communication instruments and resources for teaching and learning purposes.

Although the role of media differs in each of these three aspects, they can also (and frequently do) relate to each other, creating an interplay in teaching practices. Consequently, discussing these intersections as completely separated from each other can offer a reductionist view on media pedagogic work (Tulodziecki & Grafe, 2013). At the same time, there is the risk that these intersections may be taken as equivalent and their singularities may be ignored (Buckingham, 2003; Qvortrup, 2007). This may partly occur due to the various terms that may refer to educational practices with media, with media pedagogy or media education being sometimes used as synonyms for either teaching with or teaching about media. However, it is critical to recognize the particularities of teaching practices involving media and at the same time, to understand how they relate to each other.

Therefore, the sides of the triangle in Figure 2.1 can be interpreted as the teaching practices that happen in an interplay between the intersections. The intersection in which media is a socialization factor (B) may relate both to media being content (A) and instrument (C) in the instruction. The relationship AB indicates that, when it is understood that media use has an impact on children and youth, mediating the students’ relationship with media might become a goal of formal education. Therefore, teaching about media at school can address media as a socialization factor: by implementing strategies to foster students’ media-related competences, teachers can exercise social mediation, i.e., intervene and influence students’ media use to help them manage risks and seize opportunities in their media behaviors (Kalmus et al., 2012).

The relationship BC considers the socialization impact of media, which are expected to affect how entire generations think and behave (Friesen & Hug, 2009). As a result, different generations can be partly categorized according to the media developments with which they grow up. Thus, education within the media context highlights how formal educational environments assume that students have a common media socialization and take into consideration the media use characteristics of their students’ generation (e.g., what devices they use and own, how they deal with information and communicate) for the

organization of pedagogic and communication processes (Qvortrup, 2007). In regard to this point, teaching with media responds to media as a socialization factor.

The practices of teaching with and teaching about media can also relate mutually, as represented in AC side of Figure 2.1. Using media as instruments for teaching and learning in formal educational environments reinforces the need of teaching about media. According to Buckingham (2006), ICTs cannot be considered neutral tools. Instead, students should understand the technologies they are using, not only learn how to operate them but also get to know how their systems work, how data are processed, and what are the purposes of the tools and the possibilities they offer. At the same time, the teaching of media might demand the use of media. Several competences can be better developed when students have the chance to work with technologies, to test features, experience real challenges, and find solutions.

Considering these intersections between media and education, the present work focuses in the following teaching practices: fostering students' media-related competence, mediation of students' media use, and media use for media instruction. The following sections outline these practices more in detail.

2.3 Teachers' practices involved in media education

2.3.1 Fostering students' media competence

Historically, the relevance of teaching about media is attributed to media effects. Efforts in educating for the media emerged and were established as a mechanism to intervene in the influence of media on children, along with other strategies, such as regulations of media production and distribution (Davis, 1993; Hobbs, 2019). In this sense, teaching about media recognizes media as a factor with potential to contribute to children and youths' upbringing. Initially, this potential was considered to be mainly negative, as there were fears that certain media contents could corrupt children and youth against the moral and cultural values imparted by the family and the school. Thus, media education responds with a protectionist approach (Buckingham, 1998; Tulodziecki & Grafe, 2013; Yildiz, 2019).

Even though the practice of teaching about media never ceased being concerned about protectionism, during the 20th century, several different emphases unfolded. Reflecting changes in media and communication technologies, the current media education approach also brings in focus the opportunities that media offer, especially with the numerous possibilities of participation and content creation enabled by digital media. Therefore, media education practices envisage both empowerment and protection, preparing individuals

to minimize risks and maximize opportunities in their media use (Hobbs, 2010; Kirwil, 2009; Livingstone et al., 2017; Riesmeyer, 2014). In general terms, the emphasis moves from protectionism to preparation, as media education should enable students to develop their own conclusions instead of leading them to fit in positions that have been previously decided (Buckingham, 2003). In this manner, teaching about media embraces the idea of fostering media literacy, in the sense of equipping individuals with skills, knowledge, and resources for them to make informed decisions regarding their media use autonomously (Hobbs, 2019).

Consequently, media education in the sense of teaching about media is often referred to as media literacy education. Media education can be considered the efforts, actions, and processes of teaching and learning about media, aiming to foster media literacy (Buckingham, 2003). Hobbs (2019) clarifies that media education is in general understood as “all contexts in which learning about media occurs” (p. 851). Thus, media education is not exclusive to schools; it can happen in formal and informal education situations. For instance, parental mediation of children’s media use is a media education practice that happens in the realm of the family. Moreover, there are recommendations that media literacy should be fostered in the wide population, not only among children and adolescents (Ferrari, 2013; UNESCO, 2014).

However, the school is considered of particular relevance for media literacy interventions (Ranieri, 2019) since schools tend to have more resources than many parents do to advise young people effectively on media issues (de Haan & Livingstone, 2009). In addition, in many countries, attending school at least for some years is compulsory. Consequently, establishing media education in schools is considered the best possibility to reach children of all socioeconomic levels, giving most individuals the chance to get acquainted to media and technology-related issues at some point (Buckingham, 2007a).

In schools being central places of media education, teachers play a crucial role in putting media literacy policies, guidelines, and standards into practice (Sauerteig et al., 2019; Yeh & Wan, 2019). Nevertheless, constant criticism has been made that teachers in many countries rarely receive proper pre-service and enough in-service training to develop effective media education practices in class (Arcus, 2014; Yeh & Wan, 2019). Moreover, the integration of media education in schools happens mostly in the form of a transverse topic, i.e., not a stand-alone subject in school curricula but integrated in other traditional subjects. This is the most common approach adopted in European countries (Frau-Meigs et al., 2017), including Germany (Kultusministerkonferenz, 2017).

In the case of traditional school subjects, there is a consensus regarding subject knowledge, i.e., the contents within the field, which are validated by and reflected on the content of structured and well-established teacher training study programs, school curricula, and

final school exams (Ellis, 2007). Concerning the content of media literacy, even though there are proposals related to syllabi, the consensus about its scope is not well established. As a dynamic field, the scope of media expands regularly. Consequently, new topics and skills become relevant in the teaching about media (Arcus, 2014; Ranieri, 2019).

As a result, to practice media education, teachers need to accommodate ambitiously comprehensive guidelines in their subject schedule. On the other hand, media-related topics have little space in assessment of students' performance and exams. Consequently, media education might assume a rather voluntary character and depend on the interest, engagement, willingness, and initiatives of teachers to happen in class. For Aguaded and Delgado-Ponce (2019), this is the case in Germany, where media education is fairly well developed with standards and guidelines, but depends to a great extent on individual teachers' initiatives. Thus, teachers' agency plays a fundamental role regarding whether media education happens in schools and what aspects of its broad scope are granted teachers' emphasis in class.

As previously mentioned, the practice of media education is closely related to the concept of media literacy. In the context of schools, media education can be understood as the practice of fostering students' media literacy. While the fostering of traditional literacy and numeracy — referring to the abilities of reading, writing and performing mathematical operations — has undisputed priority in school practices, the place of media literacy in school education does not enjoy the same status. However, the concept of media literacy has been widely developed and covers several aspects, including the abilities that should be developed in its realm.

Media literacy

Literacy is commonly understood as the ability to read and write with understanding (UNESCO, n.d.) and is one of the primary objects of the first years of schooling. In the first years of formal education, individuals should become able to consciously use the alphabet in their mother tongue as an instrument to interpret written messages and express themselves in written form. Hence, the development of basic literacy involves, at the very least, the knowledge of the signs in a language system and the skills to recognize, interpret, and reproduce it with meaning.

In addition to these elements, the concept of media literacy also considers the channels through which the messages circulate, including their specific signs, mechanisms, and possible implications for the reception and communication of messages. Especially with the digitalization of processes, the presence of media and ICT in contemporary life is maximized. The generation and circulation of information increase greatly, and new forms of mediating the world are created, influencing values, norms, attitudes, behaviors, lifestyle, and working conditions (Buckingham, 2006; UNESCO, 2013). Due to the

relevance and ubiquity that media, technology, and information assume in contemporary society, reading and writing is considered no longer enough for an individual to exercise citizenship and participation fully.

For this reason, UNESCO (2013) pleads for “a new approach to literacy (...) drawing attention to its information, communication, media, technological and digital aspects” (p. 17). In addition, Hobbs (2010) argues that a modern understanding of literacy should integrate the fully participation in society as the purpose for which knowledge of a symbol system and skills to use it are developed. These three elements that Hobbs brings up — purpose, symbol system, and skills — are approached by Livingstone (2003) as power, textuality, and competence. According to Livingstone, textuality refers to “the symbolic and material representations of knowledge, culture, and values” (2003, p. 23), competence corresponds to interpretative skills and abilities to deal with the representations, and power consists of what the access to and skilled use of knowledge enables those who are literate.

In media literacy, textuality involves media aspects that shape and influence symbolic representations. The model of multiple media literacies proposed by Meyrowitz (1998) posits that in media literacy, the abilities to read and write symbolic representations are applied in relation to three aspects of the media: (1) the content, i.e., the messages that media contain and conduct, (2) the grammar, which corresponds to the variables that can be manipulated from the communicator’s side in media productions and thus, influence the impact media products have, and (3) the medium itself, referring to the characteristics that are unique to each specific channel, technology, and platform, independent of message and grammar.

Consequently, media literacy considers complex symbol systems composed by an array of elements that build meaning. According to Buckingham (2003), education to promote literacy in media symbol systems should examine a range of questions regarding production, language, representation, and audiences. Production confronts the fact that media products are manufactured, usually aiming at commercial profit. Thus, pertinent aspects to be examined would be, for example, who makes media products, who owns the companies and platforms that make media products and through which they circulate, and who controls the production and distribution of media. Language refers to the variation of resources used by different media to communicate messages, such as written and verbal text, still and moving images, and sound. This element accommodates questions regarding what language forms are used by each medium, how language resources are combined to produce meaning, and what are the possible effects of choosing one language form over another. Next, the element “representation” is based on the principle that media provide versions of reality. Issues to be explored in this aspect include the degrees of realism

that different media products aim at, whose views are voiced in the media, how particular social groups are depicted in the media, and how media possibly affect the perceptions of society about these groups. Finally, the fourth element is audiences, referring to who are the targets of media messages and who these messages reach. Moreover, audiences include questions of how and why groups use media.

Thus, textuality in media literacy considers the core components of the communication process. It considers the perspective of the communicator, who produces the messages, along with the attributes of the message contents, and the particularities of different media, as the channels through which these messages circulate. Moreover, it looks at the perspective of audiences, the possible uses of media and contents, and the effects that they may provoke. In order to utilize textuality both as receiver and producer of mediated symbolic representations, competence comes into play.

UNESCO (2013) defines competence as “the ability of an individual to mobilize and use internal resources such as knowledge, skills and attitudes, as well as external resources (...) in order to solve a specific problem efficiently in a real-life situation” (p. 55). In the case of media-related literacies, the competences correspond to the abilities demanded in digitalized, information-dense environments with multiple forms of communications (Buckingham, 2006) for individuals to participate fully in different sectors of society (Hobbs, 2010).

The development of competence is often at the core of media literacy frameworks. A look at the definitions of media literacy offered by several organs and scholars highlights the centrality of the element “competence” in the media literacy construct, for instance:

- One of the first widely accepted definitions of media literacy was formulated in the National Leadership Conference on Media Literacy that took place in 1992 in the United States: “the *ability* of a citizen to access, analyze, and produce information for specific outcomes” (Aufderheide, 1993, p. 6).
- The Ofcom (n.d.), the regulator organ of communication services in the United Kingdom, defines media literacy as “the *ability* to use, understand and create media and communications in a variety of contexts.”
- The definition of media literacy by Potter (2013a) reads “a *set of perspectives that we actively use* to expose ourselves to the mass media to interpret the meaning of the messages we encounter” (p. 23).
- UNESCO (2013) proposes a definition of media and information literacy “as a *set of competencies* that empowers citizens to access, retrieve, understand, evaluate and use, create, as well as share information and media content in all formats, using

various tools, in a critical, ethical and effective way, in order to participate and engage in personal, professional and societal activities” (p. 17).

- Hobbs (2010) defines media and digital literacy as “a *constellation of life skills* that are necessary for full participation in our media-saturated, information-rich society” (p. vii).

Also, most media literacy standards consist of sets of competences that individuals should develop to be media literate (see Chapter 3). For occupying such a central place in the construct, competence and literacy in relation to media are sometimes used interchangeably. In the German language, the equivalent term for media literacy is actually media competence [*Medienkompetenz*]. Moreover, the working framework of the Joint Research Centre of the European Commission adopts the term “digital competence” (Cartero et al., 2017; Ferrari, 2013).

In the various competence sets that integrate media literacy frameworks, different dimensions can be identified. Firstly, there is a variety of literacies that are related to specific media formats, which reflect different emphases in competence domains. For instance, information literacy has been used since the 1970s and originated in the library studies field to address concerns with the growing amount of circulating information and the variety of sources available (Doyle, 1994). Besides, there are literacy proposals that set technologies in focus, such as computer literacy (Johnson et al., 1980), ICT literacy (Educational Testing Service, 2002), and internet literacy (Bauer & Ahooei, 2018). Other concepts address specific media products, as in the case of news literacy (Kajimoto & Fleming, 2019), and advertising literacy (Malmelin, 2010).

Attempts to differentiate these domains from one another are practically useless for contemporary working frameworks of media literacy. Even though some might focus on a specific medium or medium type, and highlight certain types of competence, the skills they propose can be largely applied to other sorts of media. Considering the diversity and convergence of contemporary media technologies, it is challenging to establish a single literacy that accommodates its entire range (Buckingham et al., 2005). Some concepts try to address this issue by using composite constructs of literacy, such as media and information literacy (MIL) (UNESCO, 2013), computer and information literacy (CIL) (Fraillon et al., 2020), and digital and media literacy (Hobbs, 2010).

Similarly to what happens in the discussion about the terms “media” and “technologies” in schools, as mentioned in section 2.1, the concepts and proposed competences of these different literacy labels greatly overlap and relate to each other (Hobbs, 2010; Wilson et al., 2011). Therefore, instead of treating these diverse literacy labels as different constructs, they can all be considered media-related literacies that emphasize certain competence domains. Overall, as a matter of terminology, media literacy is considered

a more inclusive term, admitting media processes independently from source or form (Celot, 2010). Thus, throughout this work, media literacy should be understood as an umbrella term for media-related literacies.

Due to the variety of competence domains, it is common that contemporary frameworks of media and related literacies involve a wide range of competence types. Frameworks of media-related literacies usually prescribe instrumental or functional competences, corresponding to abilities of undertaking operations with technology, such as operating hardware and software (Buckingham, 2006; Gutiérrez Martín & Tyner, 2012). The abilities to access and deal with devices and their functions, systems, programs, and applications to perform tasks are considered the first step in the contact with media and technology, as they enable, and at the same time, require, other sorts of competences (Buckingham, 2006; UNESCO, 2013).

One of the enabled and required competence sorts refer to critical competences, which correspond to the abilities of analyzing and evaluating media contents and mechanisms as well as reflecting about media behaviors, experiences, and effects. Some definitions of media literacy set critical competence in the core of the construct, such as the one by the European Association for Viewers Interests (EAVI): “media literacy may be defined broadly as an individual’s capacity to interpret autonomously and critically the flow, substance, value and consequence of media in all its many forms” (Celot, 2010, p. 4).

Further competence types present in most media-related literacies frameworks are production, protective, and informational competences. Production competence corresponds to abilities to produce contributions to engage in activities in participatory online environments as well as producing multimedia content for self-expression and creative exploration (Baacke, 1996). Competences of the protective type refer to safety aspects, i.e., developing individuals’ abilities to insulate themselves from media content, practices, and habits that might be harmful (Livingstone et al., 2004). For information literacy being a traditional field, it was previously mentioned as a competence domain. However, competences in identifying information needs, searching, and dealing with information are practically omnipresent in media-related literacies standards (Buckingham, 2006). Therefore, they exceeded the domains of information literacy and are frequently considered a competence type.

On top of these prevalent competence types, Jenkins et al. (2009) argue that social skills related to new media must be developed. This type of competence includes skills in networking, negotiation, and collaboration, for instance. Moreover, several media and related literacies proposals establish links with the so-called 21st-century skills. According to Binkley et al. (2012), these are largely performance oriented. That is, they consist of applying knowledge, skills, and attitudes to ways of thinking and working, aiming at

enhancing performance in face of the characteristics of digital media, e.g., the ability of multitasking.

In summary, competence is a central element in the media literacy construct, with the function of enabling the handling of textuality to generate “power”. In the literacy construct, power refers to expected individual and social outcomes of the development and application of competences. Outcomes of media literacy in individuals are, for instance, the awareness of the experiences individuals have with media (Buckingham, 2006), and the control to negotiate meaning while consuming media, so that, to some extent, users can manage the influence of media over them (Aufderheide, 1993; Davis, 1993). Awareness and control should also associate with a minimization of risks in media consumption, which is a traditional desired outcome of media education practices, as previously mentioned. Moreover, it is expected that media literacy empowers individuals to seize the opportunities that the use of media and technology offer for “work, employability, learning, leisure, inclusion, and participation in society” (Ferrari, 2013, p. 2).

Media literacy is also considered an enabler of human rights. While the classic concepts of literacy and numeracy are related to the right of education, UNESCO (2013) argues that contemporary contexts of society demand the inclusion of media, information, and technology elements in the understanding of literacy for the fulfillment of other human rights: “literate use of information, media and ICT tools, including the Internet, will help to ensure that everyone enjoys the full benefits of the Universal Declaration of Human Rights, particularly freedom of expression and access to information” (UNESCO, 2013, p. 9). In a similar approach, the European Commission considers media literacy necessary for individuals’ inclusion in society and exercise of citizenship (Ding, 2011).

In turn, it is expected that the impacts of media literacy at the individual level contribute to the development of society as a whole. Besides the provision of physical access to technology, media literacy is also considered a crucial measure against the digital divide (Buckingham et al., 2005; Jenkins et al., 2009). When more individuals have the necessary skills, knowledge, and attitudes to make use of media for participating actively in democratic processes, exercising citizenship, contributing to the economic and cultural aspects of society, and taking part in lifelong learning (Ferrari, 2013; Jenkins et al., 2009; Livingstone et al., 2004), society as a whole should reap the benefits.

In addition to textuality, competence, and power, another aspect worth noting in the concept of media literacy is that it is not binary. That is, individuals can hardly be classified strictly as either media literate or media illiterate. Instead, it is argued that individuals can achieve different levels of literacy in different competence types and domains. The fifth law of media and information literacy according to UNESCO is “MIL is not acquired at once. It is a lived and dynamic experience and process” (Grizzle & Singh,

2016, p. 34). Thus, media literacy as a qualification and accomplishment cannot be precisely assessed, its borders cannot be defined nor a definite state of media literacy can be achieved (Buckingham, 2007a; Potter, 2013b). Consequently, “literacy is not an end in itself” (Livingstone, 2003, p. 21), but looks rather like a path.

Considering this, the fostering of media literacy through the practice of media education at school cannot generate a definite media literate status. Instead, it should be seen as a guide on the path of media literacy. Ideally, students will continue following this path further afterwards and throughout their lives, getting to know new textuality elements, developing further competences, and acquiring more power. Furthermore, while teaching about media in formal education is considered a crucial practice to promote young people’s media literacy, it is not the only way to develop it. Practices exercised by different actors inside and outside schools can contribute to the promotion of media literacy, for instance, the social mediation of children and youth’s media use.

2.3.2 Social mediation of young people’s media use

In the context of media education, mediation refers to the kinds of social interactions that mediate children and adolescents’ media use. Historically, most of the discussion about mediation has been developed around the role of parents. Initially, mediation had television consumption and exposure as its main object (Nathanson, 2001). In this sense, it is plausible that the role of parents was central since most television and other media consumption (e.g., video games) used to happen at home (Mendoza, 2009). Consequently, many definitions of mediation include a parental character, even when applied to children’s use of other types of media. For instance, Kirwil (2009) refers to online media when defining mediation as “regulatory strategies that parents introduce to maximize benefits and minimize their children’s risks from internet use” (p. 395). Youn (2008) agrees that parents are one of the most influential agents in intervening on teens’ media use, especially when it comes to protective online use measures. Livingstone and Helsper (2008) describe mediation in more general terms as “parental management of the relation between children and media” (p. 581). Also, Potter (2013b) refers to mediation as media literacy interventions, focusing on the strategies used by parents and caregivers to help children protect themselves from potential harm that media exposure may cause.

Frequently, the interventions in media use aim at influencing possible media effects on children and adolescents. Therefore, mediation is often connected to the goals of maximizing opportunities and minimizing risks in media use. Livingstone and Haddon (2009) classify into three categories the opportunities and risks that children and youth are likely to find in online media use. The first category is content, which refers to materials and resources that the young person comes across as the recipient. Contact is the second

category and corresponds to situations in which the child or adolescent is a participant in the interactions with other people, including strangers. Finally, the category conduct relates to situations in which the young person is an active actor, performing actions in the online environment.

As the use of mobile devices connected to the internet proliferates among youngsters, the consumption of media gets decentralized from home, and consequently, moves further away from the domain of parents (Nikken & Jansz, 2014). In addition to the possibility of consuming media everywhere inside and outside of the home, mobile devices with online connection provide access to an immense number of media products, platforms, and content. Also, portable and handheld devices allow a high degree of personalization in media consumption. With such media device features, children and youngsters' agency related to their media use is reinforced, and parents have more difficulty in accompanying and making assumptions about their children's media use.

Moreover, children and adolescents' greater agency over their media use may lead them to initiate situations that develop into mediation activities, as they share experiences, exchange ideas, and ask advice about media use from adults and especially from their peers (Livingstone et al., 2017). Thus, children can create situations in which parents, teachers, caregivers, and peers intervene in some way in their media use. This perspective of mediation by multiple agents is contemplated in some scholarly approaches to mediation, like how Martinez summarizes the mediation practice as "how different social agents manage and relate to children's media use" (Martinez, 2020, p. 3). Another example is the definition offered by Kalmus (2013), who refers to social mediation of children's internet use as "the practices and strategies used by socializing agents to support, monitor, and regulate children's online behavior" (p. 137).

A central element of the concept of mediation of children's media use are the types of interventions adopted by agents. Frequent mediation strategies mentioned in the literature (Livingstone & Helsper, 2008; Nikken & Jansz, 2014; Nikken & Schols, 2015; Smahelova et al., 2017; Zaman et al., 2016) are:

1. Co-use, when agent and child use media together. In this mediation situation, the agent can serve as a role model for the child, or the intervention can occur by means of active mediation.
2. Active mediation, when the agent speaks to the child about their media use. This situation can be initiated by the child, for instance, when they ask something about media content or technology features, or report about their media use experiences.
3. Restrictive mediation, which consists of setting rules and limits for the child's media use. These restrictions can consist of either agreeing with the child the conditions

for the media use, e.g., period of the day, duration, and types of content that can be consumed, or implementing technological resources that automatically limit the media use, such as tools for blocking access to specific content.

4. Monitoring and supervision, referring to the verification of a child's media activity either by checking the registrations left in devices after the child has used them or staying nearby while the child is using media.

Considering the characteristics of mediation strategies, Kalmus (2013) classifies them in two main categories: support and restriction. The former refers to activities characterized as help, guidance and co-use, which could be exercised by any agent. The latter stands for social and technical rules and limits, which tend to be applied mainly by parents and teachers. Likewise, Livingstone et al. (2017) propose a similar binary typology of mediation, consisting of the categories enabling and restrictive. Enabling mediation focuses on favoring the child to explore opportunities in their media use and includes strategies of active mediation, child-initiated support, technical controls, and monitoring. On the other hand, restrictive mediation emphasizes minimizing the risks that media use may pose and occurs mainly in the form of social restrictions. Interestingly, technical controls are classified as enabling. According to Livingstone et al. (2017), even with the restrictions set by agents with the help of technical tools, the child is free to use media and explore opportunities according to their will within those boundaries automatically set. Moreover, the two mediation types do not exclude each other, i.e., agents may use a combination of them, as active mediation with rule setting (Livingstone et al., 2017; Martinez, 2020).

Furthermore, strategies may be implemented in distinct moments of the child's media use. Valcke et al. (2011) observe that restrictive mediation occurs before the usage takes place, while active mediation, monitoring, and supervision are strategies applied to the use that is happening or that already took place. Focusing on mediation that aims at minimizing risks, Kirwil (2009) differentiates the moments in which the interventions occur as proactive mediation and reactive mediation. The former consists of applying strategies so the child avoids running into a risky or harmful situation, while the latter is exercised when the child faced a situation that bothered it somehow, and sought for intervention of an agent.

Based on the strategies adopted, Kalmus (2013) points out that agents can play different roles as mediators, namely:

1. Gatekeepers: the agents condition the child's media use by blocking or conducting access to specific technologies and content.

2. Guides: they help make sense of the multiple media processes and phenomena, especially in the internet, which can be confusing or difficult for the child to deal with.
3. Windows: the mediators extend the child's perspective of the possibilities and opportunities that media offer.
4. Consolers: they exercise a type of retroactive mediation, which happens when the child turns to an agent and reports a situation that bothered or harmed it online. Then, the agent offers comfort and advice.

Although these roles could be exercised by any mediator, Kalmus (2013) connects the role of gatekeeper to parents, the role of guides to teachers, and the role of windows to peers. The differences between the kinds of mediation exercised by different agents should reflect to some extent the differences between the relationships between the child and the mediator, and the environments where the mediation happens, i.e., home and school. For instance, it is not reasonable to expect that teachers will monitor the logged activities of each student on schools' computers.

On the other hand, restrictive mediation might happen quite frequently in schools, as they usually implement a series of filters and rules, especially for internet use in the premises of the school. In this case, it might be more common that this type of restrictive mediation happens by determination of the school as an institution rather than a strategy developed by individual teachers. In addition, co-use may happen at school, as teachers and students can perform together tasks using digital media. However, the teacher usually instructs on the activities that should be conducted with media devices. Thus, even when there is co-use, it is likely that this is not based on the child's spontaneous use of media.

In general, teachers' practice is more frequently associated with fostering media literacy than mediation of children's media use. One of the main differences between the two practices is that fostering students' media literacy is usually connected with a framework, curriculum, or teaching plan. Mediation, on the other hand, happens according to the child's actual media use. However, the two practices have a lot in common, for instance, the goals of maximizing opportunities and minimizing risks in children and youth's media use. Therefore, they can interweave.

Mendoza (2009) suggests that active mediation has more potential to promote literacy in comparison to the other strategies. Active mediation implies dialogue and is an opportunity for agents to raise questions that make children reflect on media messages and processes. At the same time, active mediation can be conducted by transmitting to the child the values of the agents, i.e., what the mediator personally considers right or wrong, appropriate or inappropriate. However, Mendoza (2009) points out that it is more

acceptable that parents transmit personal values in relation to media than teachers doing so. As the primary caregivers, parents are expected to rear their children according to their sets of values and world views. Conversely, teachers are usually oriented by curricula and neutral norms to exercise their role as socialization agents. Thus, aiming to foster media literacy, it is less advisable for teachers to engage in active mediation that condemns certain media behaviors. This could lead to a simplistic idea of how to deal with media, not contributing to the development of critical thinking, but creating the idea that the teacher is the absolute reference about the right ways to consume, interpret, and create media content.

Media are the central object of teachers' media education practices at school, as in fostering students' media literacy and mediation of students' media use. Moreover, media are expected to play a role as instruments in these practices.

2.3.3 Media use for (media) education

Using media to teach has a long history at schools. For instance, Cohen (1987) refers to the 1820s, when great enthusiasm came from the novelty of producing and distributing school texts for teachers and students. Also, Yildiz (2019) comments about the visual instruction movement in the 1920s and 1930s, which supported the crucial role of audio-visual materials to improve teaching and learning, and the development of the "teaching machine" in the 1950s, a multiple-choice system that provided immediate feedback to students.

In addition, there are reports of great excitement concerning the promising uses of the television for teaching and learning. Even though some TV programs for children were applauded for their educational value, in schools, the use of television turned out to be occasional and merely auxiliary (Cohen, 1987). With the popularization of microcomputers, it did not take long for them to be considered the next big potential change-maker in education. Since the 1980s, policies and initiatives aim to equip schools with computers. These efforts got more intense with the internet and subsequent developments in ICT and digital technologies. In the course of time, the ratio of students to computers and the percentage of rooms connected to the internet at schools became important measures of school development (Cuban et al., 2001).

The constant interest that formal education casts to the developments in media and communication technologies as potential instruments has shaped a particular field of practice and research, mostly known as educational technology. In Germany, the equivalent term is media didactics [*Mediendidaktik*]. Media didactics concerns all matters involved in the use of media for teaching and learning purposes (Tulodziecki & Grafe, 2013) or simply the teaching and learning with media (Kerres, 2008). Mishra et al. (2009) define

the field of educational technology as “the study and practice of facilitating learning and improving performance by creating, using, and managing technological processes and resources” (p. 48).

In the definition by Mishra and colleagues, it is expressed that beyond the employment of media and technologies in the educational processes, the use needs to serve the purpose of enhancing teaching and learning. This aspect is also highlighted by Kerres (2008), who affirms that the focus of media didactics is the contribution that the use of media can give to the accomplishment of specific pedagogical issues (p. 118). Here, two broad pedagogical goals can be differentiated: the learning of traditional school subjects and the development of media and technology competence. In the first case, media and ICTs are educational instruments for the teaching of traditional subjects, while in the latter, media are at the same time the subject of teaching and the tools used for the instruction (Tondeur et al., 2007a).

These goals have been common expectations on the integration of technologies in education. Already at the end of the 1980s, Hawkrige (1990) identified these two approaches as popular propagated justifications for the introduction of computers in schools. He calls “pedagogic rationale” the expectation that computers improve pedagogy by offering resources that facilitate the learning of topics and subjects. With the labels “social rationale” and “vocational rationale”, Hawkrige (1990) refers to the expectation that students develop technology competence, i.e., learn to deal with and operate computers, and so, get prepared to deal with technologies in any situation in their lives, including in their future occupation, possibly even in a technology-related career.

The expectations on the contribution of media use for teaching and learning have been frequently very high, as technologies have often been seen as boosters of great innovations, changes, and dramatic improvements in education and other sectors. Examples of such expectations are that through the adoption of new technologies, be it print, audiovisual, electronic, or digital, students would be more motivated to learn, would learn more, and teachers and students would have more flexibility (Cohen, 1987). Hawkrige (1990) labels as “catalyst rationale” such expectations that technologies could make desired transformations in education come true.

Although the availability of ICT at school is a fundamental condition, the fulfillment of the expectations on the contributions of technologies to education necessarily pass through the teaching practice. Whether and how ICTs are used in class are assumed to be decisions of individual teachers (Gutiérrez Martín & Tyner, 2012), rather than a systematic and established practice in the profession (Ertmer & Ottenbreit-Leftwich, 2010). Therefore, the teacher has been considered the decisive factor for the successful media use in class (Antritter & Laporte, 2013). For the central role attributed to teachers in the

implementation of media in education, research developed interest in seeking explanations for the differences in the extent to which teachers implement technologies in their practice.

A well-known example is the will skill tool model (WST). Knezek et al. (2003) emphasize the influence of the teacher in the classroom when they propose the model with three elements considered crucial for successful technology use in class. Two of these elements depend on the teacher: a favorable attitude to technology use (will) and the ability to use technologies (skill), while one element, the tool, i.e., the equipment available to the teacher, depends on the school infrastructure. Hence, it is usually understood that once the technologies and necessary infrastructure are available, the teacher is the one who makes the decisions concerning the use of media and technologies in the educational context.

In a later revision of the WST model, Knezek and Christensen (2016) point out that further characteristics of teachers, such as their pedagogical style, might also play a role in their integration of ICT in class. Similarly, Mishra et al. (2009) advocate that “educational technologies exist in the interplay between pedagogical knowledge, content knowledge, and technology knowledge” (p. 51). In other words, the teachers use technologies in their practice according to the combination of their repertoire of teaching methods and strategies, the topics in the subjects they are responsible for, and their ability in using technologies. These associations between teachers’ media use and teachers’ professional and personal characteristics have received great attention in research, as discussed in a later chapter (Chapter 4).

As previously discussed, when the fostering of media competence is the pedagogical goal, media are the topics and subjects of the instruction. However, the use of media, especially ICT, for teaching about media is not mandatory. For instance, Pötzsch (2019) argues that pedagogical activities that aim to foster critical media competence do not necessarily demand the use of technologies. Thus, using ICT for instructing about media may depend on the type of competence targeted, besides the conditions of the learning environment and teachers’ characteristics.

Considering the intersections between media and education (see 2.1, p. 11), the focus of the present work is on education about media. Therefore, it addresses the teachers’ practices in media education described above. It takes the fostering of students’ media competence as the central practice, and considers its links with media use for instruction and mediation of students’ media use.

Chapter 3

Context of media education in Europe, Germany, and Thuringia

Compared to traditional school subjects such as language, mathematics, and natural sciences, governmental initiatives to address media literacy in school curricula are recent in most countries. Additionally, investments on technology and digital media have been present in the political agenda for education in the last decades. Therefore, media education practices at school are organized to some extent according to the orientations and recommendations from higher-level policies. This chapter presents a selection of influential organizations, documents, and guidelines that shape the context in which media education practices have been developed in the last two decades in Europe, Germany, and the Thuringia State.

3.1 Europe

Without considering the traditions in media education of individual European countries, but rather the position and recommendations of the European Union (EU) in the figure of the European Commission, it is noticeable that attention has been given to media education in initiatives in the fields of media and education.

The promotion of digital literacy has been a constant part of the EU's agenda since the early 2000s. In 2006, the European Commission issued the recommendation “Key Competences for Lifelong Learning — A European Reference Framework,” in which digital competence is one of the elements (European Parliament and the Council of the European Union, 2006). In a recent update of the framework, digital competence is described as explicitly including media and related literacies, such as data and information literacy (Council of the European Union, 2018). Since the 2006 recommendation, the European Commission has issued a series of documents and reports that address media education

and the fostering of digital literacy among the population in Europe, with part of these publications aiming specifically at formal school education.

The EU expresses its expectations on the member states in promoting media literacy and regularly assessing media literacy levels in the broad spectrum of society in the Audiovisual Media Services Directive of the EU (European Parliament and the Council of the European Union, 2010). The Directive is a reference of norms related to all audiovisual media, with which national legislation of member states should comply. In response to the Audiovisual Media Services Directive’s request to provide regular evaluations of media literacy levels, the European Association for Viewers’ Interests (EAVI) was contracted by the European Commission to develop and propose criteria to measure media literacy levels in Europe. The EAVI is an independent not-for-profit association for the interests of media users in Europe. It aims to engage European institutions in the promotion of media literacy, defense of public interests, media accountability, citizens’ participation in media governance, and quality media programming, based on information and knowledge (Celot, 2011).

In developing criteria to measure media literacy, the EAVI’s outcome was that “a pure mathematical model appeared to be unsuitable for reliable analysis of media literacy” (Celot, 2012, p. 78), but should rather be considered a dynamic phenomenon. Thus, they point out that both an individual’s media capabilities and external factors should be taken into consideration to evaluate media literacy in a country. Table 3.1 shows the three types of individual competences and their respective indicators proposed by the EAVI.

Table 3.1: EAVI media literacy assessment criteria: Individual competences

Competence types	Indicators
1. Use	Balanced and active use of media Advanced internet use Computer and internet skills
2. Critical understanding	Knowledge about media User behavior Understanding media content
3. Communication	Participation Social relations Content creation

Note: Author’s illustration based on Celot (2011).

According to Celot (2011), usage skills refer to technical and practical skills to operate devices, tools, and systems, which demand little reflection processes. Conversely, critical understanding involves knowledge and cognitive competence to evaluate and interpret media elements, mechanisms, and implications, draw conclusions and make informed

decisions. Communicative skills are presented as social abilities, which refers to skills in building social connections, participating in the public sphere as a citizen, and producing content with media.

The extent to which individuals are able to develop these competences are influenced by environmental factors. These correspond to countries' characteristics, such as access to media and information and the media literacy context. The dimension of access refers to indicators of the types of media that are available, e.g., newspapers, radio, television, cinema, mobile phone, and internet, and how those are distributed among citizens. It also includes aspects of media pluralism, i.e., the range of choice of media content available and the freedom of the press. The media literacy context dimension involves indicators that reveal to what extent media education is established, e.g., media literacy integration in school curricula and teacher training. Moreover, it takes into consideration whether there are regulations on media literacy at the policy level, and to what extent civil associations engage in the promotion of media literacy (Celot, 2011).

In a recommendation from 2009, the European Commission established a definition of media literacy: "Media literacy relates to the ability to access the media, to understand and critically evaluate different aspects of the media and media content and to create communications in a variety of contexts" (Commission of the European Communities, 2009, p. 10). It also determines that media literacy includes all types of media. Moreover, it clarifies that it is the member states' responsibility to plan how media literacy is incorporated in their respective school curriculum. Although the member states are responsible for the organization and content of their education systems, the European Commission understands it can contribute by providing recommendations, frameworks, and research, and supporting exchanges and cooperation between the member states and with relevant partners.

Moreover, the recommendation points out elements that were lacking in the efforts to promote literacy in Europe at the time, namely, a shared vision on the promotion of media literacy, an overview of the initiatives and activities promoted by member states, a network on the topic throughout the EU, and research-based standards to assess media literacy. Since then, several initiatives have been developed to tackle these shortcomings, for instance, the creation of the Media Literacy Expert Group and the European Digital Media Observatory, and a closer involvement of the Joint Research Centre with the topic of media literacy.

The Media Literacy Expert Group, established in 2011, focuses mainly on documenting and promoting good practices in the field of media literacy, coordinating EU policies, and supporting EU programs and initiatives. Between one and three experts by member state form the group, which meets annually. The European Digital Media Observatory

is a project that connects professionals and organizations to work collaboratively in the fight against disinformation. Examples of its activities are the mapping of fact-checking services in Europe, organization of a database of high-quality research on disinformation, and the organization of a public portal to offer resources for citizens to increase awareness about disinformation and foster media literacy (European Commission, n.d.-a).

One of the main organs involved in the preparation of recommendations is the science and knowledge service of the European Commission — the Joint Research Centre (JRC). The JCR is composed of scientists that conduct research and provide independent advice and support to EU policies. “Learning and skills for the digital era” is one of the research topics to which the service is dedicated. A major contribution of the JRC to the topic of media literacy is the development of digital competence frameworks.

The DigComp is the framework for citizens in general. It consists of a set of information, communication, production, protective and problem-solving skills in dealing with technologies, digital content, and data, organized in five areas that accommodate a total of 21 competences, as Table 3.2 shows. The first DigComp version was published in 2013 (Ferrari, 2013) and updated in 2017 (Carretero et al., 2017). Except for a slight reformulation of terms, the five areas and its competences remain the same.

Table 3.2: The DigComp framework: Areas of digital competence for citizens

Competence areas	Competences
1. Information and data literacy	Browsing, searching and filtering data, information, and digital content Evaluating data, information and digital content Managing data, information, and digital content
2. Communication and collaboration	Interacting through digital technologies Sharing through digital technologies Engaging in citizenship through digital technologies Collaborating through digital technologies Netiquette Managing digital identity
3. Digital content creation	Developing digital content Integrating and re-elaborating digital content Observing copyright and licenses Programming
4. Safety	Protecting devices Protecting personal data and privacy Protecting health and well-being Protecting the environment
5. Problem-solving and negotiating	Solving technical problems Identifying needs and technological responses Creatively using digital technologies Identifying digital competence gaps

Note: Author’s illustration based on Carretero et al. (2017).

Although the DigComp consists of desirable competences for citizens of all ages to develop to become fully digitally functional, when thinking in the context of schools, it can be seen as a syllabus with the topics that should be taught for students to develop the corresponding competences.

Concerning the digital competences the teachers should develop, the European Framework for the Digital Competence of Educators (DigCompEdu) consists of competences in six areas of teachers' professional activities, as shown in Table 3.3. Different from the DigComp for citizens, the DigCompEdu refers to skills applied specifically in professional and pedagogical contexts of teachers' practice. Most competence areas refer to the digital media use for instruction, i.e., the preparation and performance of classes (areas 2 and 3), and the enhancement and assessment of students' progress (areas 4 and 5). The use of digital technologies is also addressed in situations out of the classroom, as in professional communication and training activities (area 1). Additionally, the last competence area emphasizes the skills in teaching about digital media to foster students' media-related competence (area 6).

Table 3.3: The DigCompEdu framework: Competence areas of teachers' professional activities

Competence areas	Competences
1. Professional engagement	Using digital technologies for communication in professional interactions, collaboration with other educators, and continuous professional development
2. Digital resources	Dealing with and profiting from the variety of digital resources available for teaching Adapting existing materials to their needs and creating new resources Sharing digital resources in accordance with privacy and copyright rules
3. Teaching and learning	Planning and implementing digital devices and resources in instruction Experimenting with and developing new formats for instruction Using digital technologies to stimulate and guide collaboration between students Using digital technologies to involve students more actively in their own learning processes
4. Assessment	Using digital technologies and strategies to diversify assessment formats, collect evidence of successes and challenges in the learning process, provide feedback, and plan further teaching that responds to learners' necessities
5. Empowering learners	Using digital technologies to strengthen student-centered learning that enhances inclusion, personalization, and learners' active engagement
6. Facilitating learners' competence	Fostering students' digital competences Enabling learners to creatively and responsibly use digital technologies for information, communication, content creation, well-being, and problem-solving in teaching and learning activities

Note: Author's illustration adapted from Redecker (2017, p. 16).

The Framework for Digitally Competent Education Organizations (DigCompOrg) fo-

cuses on the process of systematic integration of digital technologies in institutions of all educational levels — primary, secondary, and tertiary. Therefore, different from the DigComp and the DigCompEdu, it does not list competences that individuals should seek. Instead, the DigCompOrg consists of aspects in educational institutions that are susceptible to being transformed by digital technologies:

1. Leadership and governance practices, corresponding to how the institution’s strategic plan, mission, and vision address the potential of digital-age learning, how the implementation plans support the strategies and prioritize digital-learning, and to what extent a management model of responsibilities, resources, and implementation status is structured.
2. Teaching and learning practices, focusing on the promotion of digital competence among staff and students, and the development of pedagogies that foster new roles for teachers and students, collaboration, and personalized-learning.
3. Professional development, indicating the degree of commitment with promoting continuous professional development for staff at all levels.
4. Assessment practices, relating to the diversity of assessment formats implemented, including summative, self- and peer-assessment, personalized feedback, and learning analytics to support learning and curriculum planning.
5. Content and curricula, referring to the creation, sharing, and adoption of digital content and open educational resources, and diversification of time and places of learning.
6. Collaboration and networking, relating to staff engagement in internal and external collaboration, students’ engagement in networking, and the institution’s communication strategy and online presence.
7. Infrastructure, indicating the extent to what physical and virtual spaces are organized to enable digital learning, technical support is available, and measures for privacy protection and safety are established.

The fostering of individuals’ digital competence is addressed in the area “teaching and learning,” which prescribes the use of technologies for the promotion of digital competence among staff and students. Thus, it implies the implementation of both the DigComp and the DigCompEdu. The DigCompOrg is developed with the purpose of self-evaluation of “progress in integrating and effectively using learning technologies” (Kampylis et al., 2015, p. 17). Thus, it is complemented by a self-assessment tool, the Self-reflection on

Effective Learning by Fostering the use of Innovative Educational technologies (SELFIE). SELFIE consists of a questionnaire composed by sentences corresponding to the elements in the DigCompOrg. The questionnaire is aimed at school leaders, teachers, and students of primary, secondary, and vocational schools.

In addition to the frameworks, the EU has a Digital Education Action Plan (European Commission, 2018, 2020). The plan aims to foster “purposeful use of digital and innovative education practices” (European Commission, 2018, p. 4) to prepare citizens with the necessary skills to guarantee growth and inclusion in the EU, and tackle the infrastructure and skills divide between and within EU member states. Therefore, the first version of the plan establishes three main priorities for education, namely, the use of digital technologies for teaching and learning, the fostering of digital competence, and the adoption of data analysis for improving education.

In response to the impacts that the COVID-19 pandemic caused in education institutions, the plan has been updated in 2020. In the latest version, the Digital Education Action Plan highlights how investments in education and training systems are crucial for the planned digital and green transitions in the EU (European Commission, 2020). Thus, the two absolute priorities of the plan are the expansion and improvement of education through the use of digital technologies in teaching and learning, and fostering digital skills.

When addressing the lessons learned from the lockdown due to the COVID-19 pandemic, the plan stresses the essentiality of equipping education institutions with very high-capacity internet. This is a requirement for institutions to deploy digital tools and meaningful resources for fostering teaching and learning that are more personalized, student-centered, collaborative, and flexible in terms of place and time of instruction. Therefore, the plan sets a point of action to support connectivity in schools under specific funding programs and encourages member states to include investments in broadband infrastructure in their national projects.

Also, it stresses the urge of fostering digital competence, highlighting the importance of skills such as combating disinformation, managing information overload, and counteracting hate speech — challenges that became especially evident during the COVID-19 pandemic. In this sense, one of the actions proposed in the plan is developing a European Digital Skills Certificate, which indicates the competence level of European citizens and is recognized by governments, companies, and organizations.

Besides the previously mentioned official recommendations, plans, and frameworks, initiatives by other organizations corroborate the media education strategies of the EU. An example is the European Charter for Media Literacy, which is a declaration that can be signed by organizations, stating their acceptance of the definition of media literacy

according to the EU and commitment to develop actions that promote media literacy. The goal is to establish consensus about the concept of media literacy throughout Europe, and facilitate a network for media literacy projects among institutions in the EU countries. It was an initiative of the UK Film Council and the British Film Institute.

In summary, efforts to promote media education have been part of the European political agenda both in relation to using digital media to improve teaching and learning and fostering citizens' media-related literacies. The role of the EU has been providing references for the member states to organize their education systems concerning media education accordingly. Studies that evaluate how media education has been organized in Europe show that there are large variations between the member states (Frau-Meigs et al., 2017; Hartai, 2014). These studies are discussed in more detail in Chapter 4. For now, an overview of the main policies and guidelines that organize media education in Germany is presented.

3.2 Germany

In Germany, educational matters are responsibility of the states — the “*Länder*”, including the organization of media education in schools. However, a recent policy by the Federal Ministry of Education, the “*DigitalPakt Schule*” specifically aims to boost digitalization in schools in the country. One of the central arguments provided for this initiative relates to promoting media education: schools need an adequate digital infrastructure to fulfill the urgent task of preparing individuals since an early age to act in a densely mediated and digital world (Bundesministerium für Bildung und Forschung, n.d.). The *DigitalPakt Schule* was launched in 2019 and consists of making federal funds available for investing in schools' technology infrastructure, e.g., good internet connection, digital whiteboards, computers and tablets for teachers' and students' use.

Moreover, the position paper “*Lehren und Lernen im digitalen Zeitalter*” (2017) [Teaching and learning in the digital age] of the Deutscher Städtetag — the committee of representatives of cities in Germany — approaches the development of students' media competence as a shared goal of the country, states and communities. It articulates how schools should be places that support and clarify aspects of the use of digital media through didactic and pedagogic concepts, contributing to reducing the digital gap in society. It highlights the role of cities and communities as “*Schulträger*” (the responsible organ for schools' maintenance) in fostering media literacy in schools. While the state is responsible for schools' human resources and curricular contents, the *Schulträger* is responsible for the equipment and infrastructure of schools. Therefore, states, communities and schools should work together and agree on concepts that match curriculum,

pedagogy, and technological infrastructure.

Besides the role that the country, states and communities play, organs and associations have also established guidelines that are reference to the *Länder* and influence their media education initiatives. One of these organs is the Kultusministerkonferenz (KMK), the group of ministers and senators responsible for education matters of the *Länder*. The KMK provides guidelines, which guarantee that education aspects have a certain degree of commonalities among the *Länder*. One of these aspects is media education. In 2012, in the resolution “Media education at school” [*Medienbildung in der Schule*], the KMK established media education as the responsibility of schools, i.e., schools should necessarily integrate the promotion of media education in their practices. The argument provided to back this determination is that it is necessary a fundamental, comprehensive, and systematic media education at school since media literacy cannot be developed only in the family or by the autonomous use of media (Kultusministerkonferenz, 2012, p. 4). In this resolution, media education at school refers to both learning *with* and learning *about* media. Moreover, it specifies that media education is not a separate subject. Instead, traditional school subjects should have their syllabus revised and accommodate media education topics and practices involving media, when it is pertinent.

Presented as the strategy “Education in the digital world” [*Bildung in der digitalen Welt*], a later resolution of the KMK builds on the 2012 recommendations and specifies the media-related competences and topics that students should develop and learn about during their compulsory school years (Kultusministerkonferenz, 2017). It points out that the competent media use complements and modifies the traditional literacy competences of reading, writing, and calculating.

The competence framework of the KMK “Competences in the digital world” is based on the competence models DigComp of the EU (Ferrari, 2013), the Länderkonferenz Medienbildung (Länderkonferenz Medienbildung, 2015), and the Computer and Information Literacy of the International Computer and Information Literacy Study (ICILS) (Fraillon et al., 2014). Table 3.4 displays the six competence areas proposed by the framework. In the document, it is argued that learning with and about media should start in primary school since many children begin having contact with digital media at an early age. Besides addressing regular schools, i.e., primary and secondary education, the strategy also includes recommendations for vocational education and higher education.

As mentioned above, the framework proposed by the Kultusministerkonferenz (2017) refers to a recommendation by the Länderkonferenz Medienbildung (LKM). The LKM is an association of directors of the *Länder* media centers [*Landesmedienzentren*] and media departments of pedagogical institutions. The association contributes with recommendations related to media education in the form of position papers. An influential position

Table 3.4: The KMK framework of competences in the digital world: Competence areas and examples

Competence areas	Competences (examples)
1. Searching, processing, and storing	Developing and applying strategies to search for information Analyzing and evaluating information sources critically Summarizing, organizing and storing information and data in a structured way
2. Communicating and cooperating	Choosing digital communication channels and tools adequately according to situations and goals Using digital tools for collaborative work in producing and editing documents Knowing and following ethical principles in communication Using private and public communication services
3. Producing and presenting	Knowing and using several technical creation and editing tools Editing, merging, presenting, publishing or sharing content in different formats Observing copyrights when using the work of others and own work
4. Protecting and acting safely	Recognizing, reflecting on and considering risks and dangers in digital environments Adopting adequate measures to protect privacy in digital environments Considering the impacts of digital technologies for nature and the environment
5. Problem-solving and negotiating	Identifying technical problems Identifying adequate tools for solving problems Recognizing own limitations in the use of digital tools and developing strategies to overcome them
6. Analyzing and reflecting	Identifying and judging the interests involved in the setting, dissemination, and dominance of topics in digital environments Knowing and using the potential of digital media for the construction of political opinions and decision making

Note: Author's illustration based on Kultusministerkonferenz (2017).

paper is the “Competence-Oriented Concept for the School Media Education,” first published in 2008 and then updated in 2015 (Länderkonferenz Medienbildung, 2015). In line with the Kultusministerkonferenz (2012), the LKM advocates for a compulsory, systematic and comprehensive media education as part of the educational duties of schools. Moreover, the paper presents a competence framework for the teaching of media, as shown in Table 3.5.

The KMK and the LKM frameworks have many similarities in the way they structure the competence areas. The first three areas shown in Tables 3.4 and 3.5 are very much alike. Both frameworks dedicate one area to the critical analysis of media aspects and address protective competences in media use. While the KMK has a specific safety com-

Table 3.5: The LKM framework for school media education: Areas and examples of competences

Competence areas	Competences (examples)
1. Searching for and selecting information	Identifying information needs Developing strategies to search for information Evaluating and discussing the credibility of sources Summarizing, editing, and processing information contents
2. Communicating and cooperating through media	Observing the specific communication characteristics of different media Handling digital learning environments and using them for both individual and collaborative learning processes Using media for participating individually and collectively in society
3. Producing and presenting media	Knowing and following organizational and legal requirements for school and external presentations Handling and using advanced functions of text, presentation, and image editing tools Using table, graphics, and calculation programs
4. Analyzing and evaluating media	Examining the associations between content, receiver, intention and format of media products Using media experiences for establishing communication processes Analyzing the impact of media as a socialization instance and part of life in society
5. Understanding and reflecting on implications of media for society	Explaining one's own media use according to situation and necessity Examining the chances and risks in media use Developing awareness of data safety and data misuse Recognizing, examining, and interpreting mediatic manipulation

Note: Author's illustration based on Länderkonferenz Medienbildung (2015).

petence area, the LKM includes it under reflective competence on implications of media for society. The main difference is the area problem-solving and negotiation competence, which appears in the KMK, but not in the LKM framework. As previously presented, this competence area is also part of the European Digital Competence Framework. Thus, while media and digital literacy standards approach mostly the same competences, digital competence seem to give stronger emphasis to technical aspects and the instrumentalization of technologies to solve problems.

In addition, associations of scholars and practitioners in the field of media and education actively contribute to the understanding and organization of media education practices in Germany. For instance, the “Medienpädagogisches Manifest — Keine Bildung ohne Medien!” (2009) [Media pedagogic manifest — No education without media!] was launched by:

- the German Society of Education Sciences [Deutsche Gesellschaft für Erziehungs-

wissenschaft — DGfE],

- the Division Media Pedagogy of the German Society for Press and Communication Sciences [Deutsche Gesellschaft für Publizistik- und Kommunikationswissenschaft — DGPK],
- the German Society for Media Pedagogy and Communication Culture [Gesellschaft für Medienpädagogik und Kommunikationskultur — GMK],
- the Institute Hans Bredow for Media Research,
- and the JFF Association [Jugend, Film, Fernsehen e.V. — Youth, Film, Television].

The manifest was subsequently signed by hundreds of scholars and practitioners in the field. The main statement of the manifest is the criticism that by then, media pedagogy did not have an established place in schools and higher education institutions. Therefore, the manifest poses a series of requests, namely the compulsory integration of media literacy-related content in formal education curricula, the promotion of media education in venues for children and youth work, the inclusion of media pedagogy as a fundamental and fixed part of teacher and pedagogic training, and an increase of the research in media pedagogy practices.

Ten years later, the Manifest received an addendum (“Medienpädagogisches Manifest – Addendum 2019”, 2019). Referring to the strengthening of media use through digital media and the increasing digitalization in most sectors of society that happened in the second decade of the 2000s, the addendum criticizes that the integration of media education standards in curricula has not happened with the necessary assertiveness. Therefore, it is suggested the allocation of a specific, separate learning area for media literacy in curricula is needed, which could also accommodate computer science elements. The necessity of establishing media pedagogy as a fixed element of teachers’ training is restated. Also, the addendum argues that continuous funding for media education projects is necessary since the consolidation of the area cannot depend on projects of a limited duration.

Another influential document is the result of a conference promoted by the German Society of Computer Science [Gesellschaft für Informatik] in 2016, the “*Dagstuhl-Erklärung: Bildung in der digitalen vernetzten Welt*” (2016). In the document, the experts request the establishment of an independent learning area that addresses topics and competences necessary in the digital world, and that at the same time, all school subjects necessarily implement aspects of digital education. The document also points out that all students should have continuous access throughout the school years to both modes of digital education — the independent learning area and aspects integrated in traditional school subjects. Finally, the experts emphasize the necessity of providing teachers the adequate

training to handle the tasks involved in digital education. One of the measures requested is the consolidation of a specific module for computer science training in teacher training programs.

The implementation of a specific school subject dedicated to topics of media and informatics, requested both by the *Dagstuhl-Erklärung* and the *Medienpädagogisches Manifest*, is addressed in the latest recommendation of the Kultusministerkonferenz (2021). The document considers that inserting in school curricula a compulsory subject that deals with topics of informatics and societal aspects of media can be a valid complement of the integrative approach proposed in the strategy “Education in the digital world”.

All these guidelines and recommendations at the country level serve as references and influence the policies established at the state level. As mentioned previously, the *Länder* have great autonomy over their education systems, including what concerns media education in schools. Thus, the next section reviews aspects about how media education is organized in the state of Thuringia.

3.3 Thuringia

Media education has been present in the political agenda of the state of Thuringia in the last decades. For instance, in the school year 2001/2002, the network *Medienschulen* [Media schools] was organized in the state. It consisted of 47 primary and secondary schools in Thuringia that were considered well equipped, advanced in their media pedagogic concepts, and willing to share their experience with other schools. In the following years, it was decided that schools should apply to maintain their “*Medienschule*” status. As a result, four secondary schools, two primary schools, and one special education school were still considered *Medienschulen* by 2017 (Thüringer Ministerium für Bildung, Jugend und Sport, n.d.).

The implementation of media education integrated in traditional school subjects has operated since the beginning of the 2000s in Thuringia. The first proposal of the Thuringian media literacy teaching plan, the *Kursplan Medienkunde*, dates from 2001 and was meant to be implemented in school years 5 to 7 (Bethge et al., 2012). This was substituted by an extended version of the plan in 2009. Not only were the contents of the teaching plan expanded, but also the classes in which it should be applied, which should be from 5 to 10 (Thüringer Ministerium für Bildung, Wissenschaft und Kultur, 2009).

The *Kursplan Medienkunde* describes the competences that the media education activities in schools should aim to foster among students in each double school year 5/6, 7/8, and 9/10. These competences are classified in seven areas, as shown in Table 3.6. According to the plan, the areas about information, communication, and presentation skills

Table 3.6: Competence framework of the *Kursplan Medienkunde*: Areas and examples of competences

Competence areas	Competences (examples)
1. Information and data	Judging the credibility of different information sources Searching for information effectively Distinguishing different data formats and using them with the right programs Presenting data in graphics and in tables
2. Communication and cooperation	Using media in cooperation with others for achieving common goals Choosing media adequately for communicating with different partners Following the adequate norms of online communication (netiquette)
3. Media production	Producing digital media outputs creatively Implementing format principles of print media
4. Presentation	Presenting work results in a digital presentation Providing sources of information correctly
5. Analysis, reasoning and assessment	Reflecting critically on own positive and negative communication experiences Evaluating the danger of media addiction
6. Media and society	Evaluating the potential effect of violence in the media Understanding why different actors present facts in different ways Understanding the meaning of media for the job market
7. Law, data security and youth media protection	Surfing safely on internet Protecting own data and private sphere effectively Dealing properly with cyberbullying

Note: Author's illustration based on Thüringer Ministerium für Bildung, Wissenschaft und Kultur (2009).

are especially suitable for the learning *with* media, while the remaining four areas — production, analysis, society, and protection — emphasize the learning *about* media. The plan assigns to the schools the task of developing teaching plans for the individual school subjects and for cross-subject projects that integrate the competences described in the *Kursplan Medienkunde*.

Moreover, Thuringia has an education plan that describes the education offerings children and adolescents until 18 years old should have access to in both formal and informal education processes (“Thüringer Bildungsplan bis 18 Jahre — Bildungsansprüche von Kindern und Jugendlichen”, 2015). Its core is the description of key aspects and goals of 10 education areas. Besides traditional subjects such as mathematics, language, and natural sciences, one of the 10 areas in the plan is dedicated to media education.

The plan defines the object of media education as a continuous process of a constructive relationship with the media world. Media education should offer an environment

where children and youngsters can safely have experiences with different media, also valuing the individual competences and existent knowledge and experiences that children already have with media. Moreover, media education should develop children and adolescents' competences to take the chances and deal with the risks that media pose, besides using the didactic possibilities that digital media offer.

The document points out that educational partnerships between families and education institutions are necessary in the process of media education. Educational institutions, like schools, play a special role in developing media competence in specific areas, especially regarding the potential of digital media for participation in society. The key points of the media education area are:

1. Expanding experiences and practical knowledge in media use.
2. Developing understanding and skills to use media for own defined purposes.
3. Developing understanding and skills to pay attention to and reflect on own media use.
4. Developing understanding and skills to interpret the nature and functions of media.

As a result of a series of discussion events about the topic of media education that happened throughout 2016 in different regions of the state, the Media Education Concept 2020 ("Thüringer Medienbildungskonzept 2020 — Herausforderung für Schulen und Einrichtungen der Kinder- und Jugendhilfe in der Informationsgesellschaft", 2016) was launched. It aims at the strengthening of media literacy in Thuringia to enable individuals to participate in society, use media in a competent way, learn collaboratively, and improve individual support in learning processes to guarantee inclusion.

As objectives, The Media Education Concept states that digital media should be used in class since children and adolescents use them anyway in their free time. In class, digital media should be used especially to foster independent and personalized as well as collaborative learning. Moreover, the concept foresees that each student should use a digital device as work tool, all teachers should develop media pedagogic competences through regular in-service training, and schools should have a well-functioning and well-managed infrastructure that allows for a stable, reliable, and fast internet connection for school activities. Therefore, the key measures of the concept consist of the development of the broadband infrastructure in the state, dissemination of 1:1 (one device per student) models in schools, expansion of the Mediothek — the Thuringian open education resources repository, the intensification of teachers' pre- and in-service training in media education, and the implementation of the teaching plan *Medienkunde* also in primary schools.

Table 3.7: Teaching plan *Medienkunde* for primary schools: Areas and examples of competences

Competence areas	Competences (examples)
1. Operating and using	Naming and differentiating between different types of media Using the basic functions of internet surfing and text editing Using digital files
2. Getting informed and searching for information	Evaluating information sources according to simple criteria Retrieving and using information from media Providing the sources of information used
3. Communicating and cooperating	Naming, comparing, and using communication channels for the exchange of information Describing and analyzing one's own communication behavior Naming and using medium-specific communication rules
4. Producing and presenting	Preparing and presenting learning results with digital resources Comparing and evaluating media products according to given criteria
5. Analyzing and reflecting	Describing and evaluating one's own media habits Recognizing some of the risks in media use and the possibilities to protect oneself from them Differentiating between reality and fiction in the media

Note: Author's presentation based on Thüringer Ministerium für Bildung, Jugend und Sport (2017).

In 2017, a media literacy plan for primary schools was launched in Thuringia. As in the plan for secondary schools, the plan for primary schools determines the integration in traditional school subjects of activities that aim for the development of students' media competences. The main purpose is that schools start with media education from the early years, so that students reach secondary school better prepared with a solid basis in fundamental aspects of media and computing for the subsequent media literacy plan. During the primary school years, students should develop media competences in five areas, as shown in Table 3.7.

In the Thuringian Digital Strategy, a chapter "Digital Education and Research" pleads for the development of children's digital competences from an early age ("Thüringer Strategie für die digitale Gesellschaft", 2018). It states that digital competence belongs together with the traditional literacy elements expected as a result of formal education — reading, writing, and calculating. One of the arguments that the document points out for developing children's digital competence is the familiarization with the area of technology and natural sciences, which can lead to a choice of academic studies and a career in those fields. Also, the goal should be that school education prepares young people to take the opportunities that digitalization offers in a responsible, critical and creative way, so that they can participate actively in cultural, social, professional, and economic processes in

society. Moreover, it emphasizes that digital media can improve the individual support of learners, and open new possibilities of teaching and learning concepts for teachers. Concretely, the Digital Strategy stated as goal that all students would have access to learning environments with access to the internet by 2021. As requirements, schools need to be equipped with fast internet connection, ICTs, and a learning platform. Furthermore, the fostering of digital competence should be a mandatory part of school teaching plans.

The program “*Zukunft Schule*” (future school) (“Der Thüringenplan — Für eine gute Zukunft unserer Schulen”, 2018) sets measures to guarantee the quality of schools in Thuringia. It develops around three key points that are especially challenging: the acquisition of qualified teachers, the development of an effective school network to prevent and minimize the cancellation of classes, and renovated and attractive school buildings and facilities. Therefore, it sets a series of recommendations to contribute to each of the aforementioned three points. Regarding the third point, the infrastructure, the plan foresees the investment in ICTs, and the update of the standard recommendations for school infrastructure to accommodate the demands of digitalization.

The plan also contains the point “digital future”, which addresses efforts to foster school digitalization. Besides the equipment of school with ICTs, it plans the work email addresses for teachers and the establishment of rules for digital communication between the people involved in schools. In addition, it proposes the adoption of a learning management platform, accessible to all schools in the state. The intensification of in-service teacher training in topics related to technology, media pedagogy, and new didactic approaches are also listed. Finally, it intends to implement a separate school subject dedicated to media and computer science, which should complement the integrative *Kursplan Medienkunde*.

Consolidating the Media Education Concept and the program *Zukunft Schule*, the Thuringian Digital Strategy for Schools (*Digitalstrategie Thüringer Schule*) was published in 2019 (“Thüringer Schulen in der digitalen Welt”, 2019). The document elucidates that the digitalization of schools demand the coordinated efforts of the Ministry of Education at the state level, the *Schulämter* (school regional offices) at the regional level, the *Schulträger* at the communal level, and the school administration at the local level.

The strategy sets the goal that by 2021, c. 850 public schools of the state should have the proper infrastructure to enable all students to use digital media for learning. Part of it is the project *Digitale Pilotenschulen* (pilot digital schools). Selected schools should receive funds for a period of five years to invest in digital media, and develop pedagogical concepts and examples of teaching and learning activities with digital media. The experiences and examples generated by these pilot schools should serve as a reference for other schools in Thuringia to make their way to digitalization.

Furthermore, the Digital Strategy for Schools determines that the teaching plans should be adapted to strengthen the fostering of media and digital literacy as well as the four Cs of the 21st-century skills: creativity, critical thinking, communication, and collaboration. It also foresees the implementation of the subject *Medienkunde/Informatik*¹ that should be introduced as a separate subject in the school curriculum to complement the plan that integrates media-related topics in traditional school subjects (*Kursplan Medienkunde*).

The examples of policies, initiatives and guidelines mentioned in this chapter indicate that organs, commissions, and associations in the EU, Germany and Thuringia State have been directing efforts to strengthening practices involving media at schools. It is noticeable that there is a stimulation for the use of digital resources for teaching and the fostering of media and digital literacy. Also remarkable is the logic presented in some policies that the enhancement of technology equipment of schools is a necessary condition to promote media education.

Important references are provided for what should be taught in the realm of media education. The frameworks that describe the competences that learners should develop — the DigComp, KMK, LKM, *Medienkunde* for primary and secondary schools — comprise usage, critical analysis, and communication skills, as proposed by Celot (2011). In general, there is a high degree of agreement among the different frameworks concerning the competence sets they propose. All include competences in the areas of information, communication and collaboration, content creation and presentation, and safe use. Except for the DigComp, the frameworks include at least one competence area dedicated to the analysis of media elements, such as content, production and mechanisms, as well as the reflection on the media influence on individuals and society.

Only the teaching plan *Medienkunde* for primary schools has a specific area for competence in operating and using, signaling that younger children especially need to be taught the basic functional and operational aspects of ICT. However, even when not directly mentioned, usage skills are involved in practically all areas of the different frameworks. The technical abilities to operate tools are implied in competences related to accessing information, communicating and cooperating with other people, producing and presenting content, and implementing protective measures. In general, the main difference is that only the frameworks that refer especially to digital competence — the DigComp and the KMK — include problem-solving competence. On the one hand, problem-solving closely relates to technical aspects. On the other hand, it involves an analytical dimension of identifying problems and one's own competence gaps, and creativity in finding solutions.

¹In the school year 2021/2022, the subject Informatik/Medienbildung was introduced as a test in 23 volunteer schools. Its syllabus has not been made publicly available.

The guidelines, recommendations, policies, and initiatives at the European, federal, and state levels are elements of the context in which media literacy is developed (Celot, 2011). Especially for schools, they play an important role in giving direction to the media education practices. However, several other factors might impact their implementation. Therefore, the following chapter switches attention to the research about media education practices.

Chapter 4

Research on media education practices

The examples of media education frameworks previously presented in Chapter 3 help structure the scope of the work related to media education at school and guide teachers' efforts in developing students' competences in the field. Nevertheless, to understand to what extent and how guidelines are implemented, i.e., how media education happens at school, a look at the practice is necessary. This chapter starts by presenting studies on the role of teachers as media educators. Then, it goes over evaluation studies of the integration of media literacy in schools' teaching plans and activities. In the sequence, it looks at studies that examine the media-related competences that teachers tend to emphasize in their practice. Finally, it refers to research on the factors that are associated with teachers' efforts in promoting media education.

4.1 Teachers' role in young people's media education

In general, there is common understanding regarding which responsibilities are expected to be fulfilled by parents and which ones by teachers in the upbringing of a child. Parents and family are considered the primary socialization agents, thus providing the initial knowledge for subsistence and social interaction through references of social norms, cultural practices, and values (Franco Miguez, 2017), which are expanded and reinforced by the socialization process with peers. On the other hand, the school leads the individual through paths of literacy, including knowledge and skills established by curricula to equip the individual for basic civic, cultural and economic participation in society.

When it comes to media education, the responsibilities of family and school are not so well defined. Ideally, the dissemination of media literacy should occur in a synergy of interventions in the realm of school education and in social interactions, as in the family and with peers (Bartau-Rojas et al., 2018; Nupairoj, 2016; Tejedor-Calvo & Pulido-Rodríguez, 2012).

Research has focused on investigating how media education happens at home, exploring the parents' perspective. Such studies tend to emphasize the parents' role in acting for the safety and well-being of the child regarding media use and its effects, investigating parents' strategies to control, supervise, monitor or intervene in children's media consumption and behavior (Bartau-Rojas et al., 2018; Cornish, 2014; Franco Miguez, 2017; Kirwil, 2009; Samaha & Hawi, 2017; Sánchez-Valle et al., 2017; Schaan & Melzer, 2015).

The emphasis on safety issues in the parental role in media education is partially confirmed when children's perspective is taken into account. Research offers some evidence as to the extent that children perceive that parents, teachers, and friends intervene on certain aspects of their media online use. In the first "EU Kids Online" survey with over 25,000 children aged 9–16 years in 25 European countries, children report receiving advice on online safety primarily from parents, to a lesser extent from teachers and the least from peers (Livingstone et al., 2011). However, this rank changes when demographics are taken into consideration. Older teenagers and children with lower socioeconomic status reported receiving advice primarily from teachers.

In the second edition of the survey (again with over 25,000 children aged 9–16 years), conducted in 19 countries, the prevalence of reported parental advice is repeated (Smahel et al., 2020). Across the participating countries, on average, parents are the main agents from whom children receive suggestions on how to use the internet safely at least sometimes (69%), closely followed by teachers (64%), while less than half (44%) report receiving regular advice on safe internet use from peers. In some countries, however, the participants that report receiving mediation on online safety from teachers outnumber the ones that affirm receiving it from parents. Participants from Germany follow the main trend: parents are mentioned as the main mediation agents on online safety (75%), followed by teachers (60%), and peers (54%).

When it comes to helping children when something bothers them on the internet, parents are also recognized as the main agent. On average, teachers are the ones that provide the least mediation in this aspect. The second EU Kids Online edition also asks participants from whom they receive active mediation in the form of encouragement to explore and learn things on the internet. In this aspect, on average, teachers appear in first place (60%), close to parents (58%). Nonetheless, there are also variations among countries. For instance, among participants from Germany, teachers are the least mentioned agent: half of the children report receiving encouragement to explore the internet from teachers, while 63% say they receive it from friends and 62% from parents.

The qualitative approach adopted by Jiménez-Iglesias et al. (2015) offers further insights in how children aged between 9 and 16 in Spain see different agents mediating

their online media use. Parents are perceived as regulatory agents that kids try to avoid as they get older. Teachers are perceived with a similar role of regulation, and are expected to intervene in conflicts that happen in the realm of the school. Among adolescents, the influence of peers is stronger in terms of source of information and support in problematic situations, as “all children who were bothered by any of the risks of the internet (sexual images, bullying, sexual messages or meeting online contacts – strangers) talked about it to a friend, more than to their parents, and much more than to their teachers” (Jiménez-Iglesias et al., 2015, p. 53). However, when it comes to solving problems, parents are considered the main agents.

Similarly, the findings by Shin and Lwin (2017) show that older teenagers tend to be more open to mediation from peers than from parents. However, each agent can mediate different aspects of adolescents’ internet use. In a survey with 746 adolescents between 12 and 18 years old in Singapore, the respondents report parents as the main agents with a little difference over teachers in advising on adequacy of websites, what can and cannot be shared online, and how to proceed when someone bothers them on the internet. Teachers are mentioned as the main agents in suggesting ways to use the internet safely. Finally, peers are the most mentioned contributors regarding recommending websites and helping accomplish tasks on internet, like finding information. Based on that, Shin and Lwin (2017) observe that adult-to-teen mediation tends to assume an instructive nature, while peer-to-teen is likely to be of a neutral kind.

To sum up, while studies agree that different agents play a role in children’s media education, teachers and parents seem to have the main responsibility, especially in earlier phases of children’s development. Moreover, the studies that examined the practice of agents in media education focus on one single area, namely mediation of internet use. The role of teachers seems to be especially relevant in stimulating children to explore and learn things on the internet, even though this trend cannot be observed in the results reported for German children. The studies give some clues as to the circumstances in which teachers may be especially important mentors in media-related matters. The role of teachers in guiding children on safe online use seems to be especially relevant among those from a lower socioeconomic condition. In addition, as parental mediation tends to soften as children get older, teachers might be important in providing constant reminders on safety aspects. However, it has not been systematically investigated yet as to what are the individual and contextual characteristics that are associated with children relying primarily on teachers to learn about media-related literacies.

4.2 Evaluation studies of media education policies

Studies that investigate how different countries organize their media education policies point out the great variances in terms of how structured, established and developed policies are, how media education is integrated in the school curriculum, and the emphasis given between ICT, digital and media literacy. A fairly international comparison is provided by the Project Future of Education and Skills 2030 of the Organization for Economic Cooperation and Development (OECD), which has analyzed lower secondary school curricula of 37 countries or jurisdictions (OECD, 2020). Therefore, a specific methodology called curriculum content mapping (CCM) was developed in the realm of the project and experts on learning areas in each participating country were trained to conduct the CCM.

One of the aspects of the analysis is to what extent countries accommodate in their school curriculum 21st-century relevant themes, such as sustainability, multiculturalism, and ICT and media. The themes “ICT and digital literacy” and “media literacy” are presented separately. According to the CCM framework, ICT/digital literacy refers to the ability to use ICTs effectively and appropriately to access, create, and communicate information in and out of school, adapting to changing technologies. Media literacy is considered the ability to think critically, i.e., assess, analyze and reflect on the content one gets from the media, including social media and news sites (OECD, 2019, p. 65, 73).

The findings point out that in all countries, topics referring to ICT or digital literacy are integrated in most of the seven learning areas: national language, mathematics, humanities, science, technologies/home economics, arts, and physical education. However, in the areas of physical education and arts, the incorporation of topics related to ICT or digital literacy is less prevalent. When it comes to references to media literacy, mentions in curricula are mostly observed in national language, humanities, and technology/home economics. Overall, topics related to media literacy are present in about 20–30% of curricula. Exceptions are Korea and Estonia, where media literacy is integrated in more than 50% of their curriculum. Thus, in general, topics and competences related to dealing with features and operating digital environments seem to have more space in curricula than critical thinking about media content, products, habits, and effects.

Even when the focus is set to European countries, remarkable differences on how countries approach media education issues exist. The European Media Literacy Education Study (EMEDUS) was conducted in 2012–2013 as part of the Lifelong Learning Programme of the European Commission. The aim of the project was to map media education practices in formal, informal, and inclusive education in Europe. To address the practices in formal education, experts in 27 EU member states at the time were surveyed on the organization, regulations, and guidelines of media education in their countries (Hartai,

2014). A few years later, Frau-Meigs et al. (2017) conducted a similar study. Based on the information provided by experts from each country, their study compares media education policies of the 27 member states, the United Kingdom (as former member state), Turkey, Bosnia-Herzegovina, and Serbia.

According to both studies, most countries show commitment with the promotion of media-related literacies and have some sort of media education in primary and secondary schools. However, Frau-Meigs et al. (2017) observe that there are differences between countries with a longer tradition in media education (e.g., Denmark, Finland, and France) and the ones that started developing policies in this field more recently (e.g., Bosnia and Latvia). Differences are also spotted in terms of how media literacy is defined in countries' policies. Frau-Meigs et al. (2017) remark that Western European countries tend to relate media and information literacy (MIL) to media education more often, while Eastern European countries tend to associate it with computer literacy. From the EMEDUS participating countries, five consider media literacy and digital literacy to be completely unrelated fields, while six treat them as related but not in a specific hierarchy. A third of the countries consider digital literacy as part of media literacy, one country treats both as equivalent, and two countries treat media literacy as part of digital literacy (Hartai, 2014).

Moreover, both studies point out that the promotion of media and digital literacy in formal school education happens mainly in the form of a cross-subject topic, i.e., media-related topics are taught across all subjects in the curriculum and are the responsibility of all teachers. The cross-curricular approach is far more common than integrating media education in traditional school subjects, in which content related to media can be explicitly identifiable in modules for specific age groups. Even more unusual is teaching media literacy as a separate subject. Hartai (2014) points out that serious consequences of the prevalence of the cross-curricular format is that the responsibility for teaching about media gets diluted in schools, leaving it unclear as to who should do it and what qualifications these persons should have. Thus, not enough investment is done in teacher training to qualify professionals for the practice. As a matter of fact, the EMEDUS points out that teachers in charge of media education are usually teachers of other school subjects and that they get acquainted with media-related topics mainly through self-study, out of their own initiative and enthusiasm, or because they are obliged to do it. In addition, Frau-Meigs et al. (2017) criticize that because MIL is taught in cross-curricular projects or is integrated in traditional school subjects, it is rarely assessed objectively in schools. In a concluding remark, Hartai (2014) affirms that in general, media education is not among the main foci of schools.

Findings of a recent report by the Eurydice share similar aspects with the two studies mentioned above, even though it focuses on digital education. The Eurydice is a network

dedicated to “explain how education systems are organised in Europe and how they work” (European Commission, n.d.-b). It is part of the EACEA — the Education, Audiovisual and Culture Executive Agency, which is under the European Commission of the European Union (EU). The Eurydice reports about how European countries (27 EU member states, one former member state, and 13 other countries) address digital education (European Commission/EACEA/Eurydice, 2019). For the study, an expert or national representative of the Eurydice per country reported in a questionnaire on the digital education legislation, official policy or guidance in their respective countries for the reference years 2018–2019.

Part of the report is dedicated to how digital education is established in the school curriculum, showing that in almost all European countries, the development of students’ digital and media-related skills is addressed in primary and secondary school curricula. However, countries include the teaching of digital skill in different ways in their curricula: as a cross-curricular topic, as a compulsory separate subject, as an optional separate subject, and as a topic integrated in other compulsory subjects. From these, the most frequent is the cross-curricular format, as is the case of media education (Frau-Meigs et al., 2017; Hartai, 2014). However, in secondary school, the compulsory separate approach related to digital competence appears often. For instance, over half of the EU countries offer subjects like computer science. Thus, in line with the OECD’s findings (2020), aspects related to technology, digital and computer skills seem to hold a better-defined space in school curricula than what concerns media studies.

A novel aspect that the Eurydice looks into is the different areas of media-related competences, indicating variations in the competence areas that national curricula emphasize. Taking the DigComp framework (see Table 3.2, p. 31) as a reference, most countries address the fostering of competences in all five areas of the framework. Most areas are incorporated in curricula for the lower secondary level. In general, more emphasis is given to the competences of information and data literacy, followed by digital content creation, and communication and collaboration. These three areas are addressed in practically all countries’ curricula.

Comparisons among European countries identify different levels of structure in media education policies. Hartai (2014) observes that some countries have clear orientations through national curricula or steering documents. Others establish some general requirements or recommendations at the national level but leave the majority of decisions related to media education to schools, while others do not have any requirements or regulations at the national level.

Such variations are also demonstrated in an investigation by the European Association for Viewers’ Interests (EAVI). The study tested assessment criteria for media literacy levels in Europe and include the countries’ media literacy context as a component (Celot,

2011). Based on qualitative data provided by experts in the participating countries via a standardized questionnaire, it was analyzed whether countries have implemented in the school curriculum ICT, digital or media literacy, and to what extent there is teacher training related to media education (e.g., occasional or compulsory), among other aspects. In the media literacy context component, Belgium, Finland, France, Netherlands and United Kingdom have the highest scores, indicating the presence of well-structured media education policies. The lowest scores represent the opposite and are reported for the Czech Republic, Malta, Poland and Romania. Celot (2011) points out that the findings indicate “a noticeable lack of cohesion with reference to media literacy policy, education and civil society initiatives” (p. 70) and that there is a correlation between individuals’ media literacy levels and the extent to which countries have structured media education policies.

Frau-Meigs et al. (2017) also identify variations and distinguish three categories in which countries can be classified based on their MIL governance frameworks. The first category is labelled as “disengaging” and corresponds to countries with limited public policies, in which the implementation of actions depends mainly on non-public actors. Countries classified in this category are the United Kingdom, Bulgaria, Italy, Serbia, Bosnia and Herzegovina, Croatia, Latvia, Romania and Estonia. The countries with medium-high performance, classified in the “delegating” category, are the Czech Republic, Portugal, Spain, Cyprus, and Lithuania. These countries with a delegating stance usually have a supportive framework that includes to a large extent non-public actors to implement activities. The third category refers to high-level performance countries and is labelled as “developing”, indicating countries with solid policy frameworks, in which the state assumes the responsibility to coordinate and implement the promotion of MIL. In this category are Germany, Greece, Hungary, Poland, Austria, France, the Netherlands, Sweden, Belgium, Slovakia, Turkey, Finland, Ireland, and Denmark.

Similarly, the Media Pluralism Monitor (MPM), an instrument to measure pluralism risks in the EU, uses three categories to classify countries according to the development level of their media literacy policies. Indicators related to media literacy are included in the MPM because it considers that media literacy is necessary for individuals to exercise freedom of expression and access to information, generating benefits both for the individual and for society (Cernison & Ostling, 2017). The Monitor first collected data in 2015 from a network of experts in 19 EU member states.

In 2015, Finland, Germany, the Netherlands, and Sweden were classified as low-risk. This category refers to countries with well-developed policies for promoting media literacy, a strong tradition of policy making in this area, and whose existing measures are coherent and up to date with the latest societal changes. The countries labelled as high-risk were Croatia, Cyprus and Malta, indicating that these countries do not have media

literacy policies and there are no steps taken in the development of any policy measures. When media literacy initiatives exist in these countries, they tend to be conducted by civil society organizations. The remaining countries lie in the medium-risk category, which corresponds to countries with an underdeveloped policy in early stages, with fragmented measures. In the MPM 2021 edition, the 27 member states are included. Belgium, Denmark, Estonia, Finland, Germany, Luxembourg, the Netherlands, and Sweden are classified as low-risk, while Latvia, Poland, Romania, Bulgaria, and Croatia fall into the high-risk category (Bleyer-Simon et al., 2021).

These evaluation studies examine how countries establish media education policies, which are an important element to structure the practices at school. The reports point out that countries, even under the recommendations of the EU, approach media education in different ways, starting with the extent to which they address it in policies. In this sense, Germany has been considered a country with well-developed media education policies (Bleyer-Simon et al., 2021; Frau-Meigs et al., 2017).

In summary, the studies indicate that the teaching about media can be addressed in different formats in school curricula. Overall, the cross-curricular approach seems to be the most popular and topics related to media and digital literacy are more frequently integrated in lower secondary school. Furthermore, the relationships between media, computer and digital literacy are not always clear in policies, and some countries might tend to give more space to technology-related content than to elements of media studies.

Moreover, the evaluation studies previously presented rely mainly on reports of national experts for their data collection. While this approach helps to shed light on countries' orientations and how much general attention they dedicate to media education, little can be inferred about how practices of media education happen in schools (Hartai, 2014). Therefore, it is pertinent to examine studies that focus on the practice of teaching about media.

4.3 Teachers' practices of media education

The same way that there are variations in policies of media education regarding the formats, areas and topics of its integration in the curriculum, it is reasonable to expect that the teaching practices of media education in schools also vary. Considering that media education frameworks consist of several competences that should be developed, a relevant aspect of investigation is which competence types teachers emphasize in their practice.

In the early 2000s, Tondeur et al. (2007b) addressed this question in relation to the ICT competence framework of Flanders, the Dutch-speaking region of Belgium. They evaluate primary teachers' emphasis in fostering three types of ICT competences proposed

Table 4.1: ICILS 2013 and 2018: Percentages of teachers who give some or strong emphasis in developing students' CIL

Competence	All countries 2013*	All countries 2018**	Germany 2013*	Germany 2018
Accessing information efficiently	63	85	36	54 ^a
Displaying information for a given audience/purpose	54	78	28	51 ^a
Using computer software to create digital work products (e.g., presentations)	56	76	29	45 ^b
Exploring a range of digital resources when searching for information	53	75	27	42 ^b
Evaluating the credibility of digital information	52	74	29	41 ^a
Sharing digital information with others	43	71	15	29 ^b
Providing references for digital information sources	49	67	32	45 ^a
Understanding the consequences of making information publicly available online	51	67	26	37 ^b
Providing digital feedback on the work of others (e.g., classmates)	34	49	9	14 ^b

Note: Sources of the data presented are *)Frailon et al. (2014, p. 216); **) Frailon et al. (2020, p. 200); a) Drossel et al. (2019, p. 222); b) author's presentation of ICILS data

in the Flemish framework for primary schools: technical (e.g., using elementary features of computers, using basic computer programs, using the correct computer terminology), social/ethical (e.g., respecting intellectual property, informing of harmful content, being aware of viruses), and aiding the learning process (e.g., independent learning, cooperation, presenting information). Their findings show that teachers give the highest attention to the fostering of students' technical skills, while the other two competence areas get approximately the same emphasis.

An international perspective on media-related competences taught at school can be found in the International Computer and Information Literacy Study (ICILS). Besides measuring 8th grade students' computer and information literacy (CIL) level, the study includes measures of school media education practices in surveys with teachers. The teachers' survey of the 2013 and 2018 editions measured the emphasis that teachers give to developing students' nine competences related to CIL, in a 4-point scale from no emphasis to strong emphasis.

Table 4.1 shows the average percentages of teachers across countries and the percentages of teachers in Germany in both editions¹ that affirmed giving some or strong

¹In the ICILS 2013, teachers' emphasis in fostering students' CIL is measured in 12 items. In 2018, nine of the items are adopted in the measure. The overview displayed in Table 4.1 refers to the items that appear in both editions.

emphasis to the development of students' respective competences. Comparing the results from 2013 and 2018, both the ICILS averages and findings for Germany show that teachers' percentages increased in 2018. It suggests that fostering students' CIL-related competences has gained more attention in teachers' practice. However, in Germany, the percentage of teachers are lower than the ICILS averages in all competences.

The study *Länderindikator*, thus far conducted in four editions (2015–2017 and 2021), assesses teachers' practices with digital media in lower secondary education in German schools. The study conducts representative surveys with teachers in the country about topics such as the technical equipment and support of their schools, their use of digital media in class, and the extent they conduct activities that aim to foster students' digital competences.

The latest edition of the study surveyed 1,512 teachers in the 16 *Länder*, recruiting at least 50 teachers per state (Lorenz et al., 2021). Concerning the use of digital media for teaching and learning, the study shows a positive trend in relation to the previous survey years in all *Länder*. Conversely, the fostering of students' digital and media literacy did not intensify.

Table 4.2 shows the percentages of teachers that affirmed they purposefully conduct five types of activities in their classes to foster students' digital competences in the 2015, 2016, and 2017 editions. The percentages are fairly stable throughout the three years, with slight increases and decreases. The most accentuated changes can be observed in 2017, where an increase occurs in the percentages of teachers that report explaining how to save information, instructing on how to edit document different formats, and surfing the internet with students. Contrarily, the percentages of teachers who give students opportunities to develop presentations (in comparison to 2016) and show they are able to evaluate the credibility and relevance of information (in comparison to 2015) decrease. In the 2021 edition,² no statistic difference was found in the percentage of teachers that affirm engaging in the activities, in comparison to 2017.

Despite the observed changes throughout the years, the activities related to the fostering of competences in dealing with information seem to be the most contemplated in teachers' practice. A similar result is identified by Breiter et al. (2010), as they found out in their study of media education practices in the North Rhine-Westphalia State that, by the time of the study, activities related to searching for information online were the most common among teachers' efforts to foster students' media-related competences in the 5th and 6th classes.

When considering the averages by state, the *Länderindikator* points to regional dif-

²By the time of the preparation of this study, only the complete results for the 2017 edition of the *Länderindikator* were available. For the 2021 edition there was only a short summary.

Table 4.2: *Länderindikator 2015–217*: Percentages of teachers who affirmed conducting the respective activities to foster students' digital competence

Activity	2015	2016	2017
<i>n</i>	1,250	1,210	1,218
Explaining to students how to save information in a document	58.9	58.2	63.3
Giving students step-by-step instructions on how to edit tables, graphics or texts	56.3	54.5	59.4
Practicing internet surfing with students	55.8	54.6	59.4
Letting students prepare digital posters or presentations independently, for which they should select relevant information from given sources	65.4	66.7	60.6
Giving students the opportunity to show that they are able to evaluate the credibility and relevance of information available in the media	79.7	72	70.1

Note: Author's illustration from Lorenz et al. (2017, p. 128, 131)

ferences, as results show up to a 20%-point difference between the states with the highest and the lowest averages for teachers that affirm conducting activities in class to foster students' digital competences (Lorenz et al., 2021; Lorenz et al., 2017). In every edition, the study classifies the *Länder* in three groups: the group with the highest percentage of teachers that affirm fostering students' digital competences, the one with a middle percentage, and the one with the lowest average percentage. Considering the five activities asked (as in Table 4.2), teachers from Thuringia have been constantly classified in the middle group in all editions. Exceptions were in 2016 and 2017, when Thuringia was among the top four states regarding the fostering of specific competences: in 2016, for the teachers that affirm instructing students on how to prepare tables, graphs and texts, and explain how to save information in a document, and in 2017, regarding letting students show how they evaluate the credibility and relevance of information.

Evaluation studies that focus on media education practices in schools in Thuringia are rare. A survey was conducted with teachers right at the beginning of the introduction of the *Kursplan Medienkunde*. Bethge et al. (2012) conducted a survey with 234 teachers that took part in the training related to the media literacy framework in 2010. In most cases, these teachers were responsible for the coordination of the *Kursplan Medienkunde* in their schools. Only descriptive findings of the survey were published, showing, for instance, that almost 80% of participants had a positive opinion on the *Kursplan Medienkunde*, while a bit over the half (54%) found it a good idea to combine media education and computer science contents. The main problems concerning the media education in their schools pointed out by teachers were the insufficient ICT equipment available, the need for teachers' professional development regarding media education, the motivation of colleagues, and the integration of media literacy content in traditional subjects. As

clarified by Bethge et al. (2012), the survey did not investigate any aspects of the actual implementation of the *Kursplan Medienkunde* in schools, such as the emphasis given to fostering specific competence areas. After the survey by Bethge and colleagues and until the study that will be presented in this work, it was not possible to identify any other studies that evaluated aspects of the *Kursplan Medienkunde* in schools in Thuringia.

Succinctly, investigations on teachers' emphasis in teaching about media literacy aspects show that some competence areas receive more attention than others in teachers' practices. In comparison to the comprehensive media and digital literacy frameworks discussed in Chapter 3, the competence pool considered in the studies is reduced. The ICILS and the *Länderindikator*, for instance, concentrate on aspects related to computer and information competences. Thus, it is possible that more differences are identified in the extent to which media-related aspects are taught to students when a broader variety of competence areas are considered, e.g., safety and critical analysis.

While the ICILS show an increase in the average percentage of teachers that give at least some emphasis in developing students' computer and information skills in 2018 in comparison to 2013, such a trend cannot be observed so clearly between 2015–2017 and 2021 in the sample of German teachers of the *Länderindikator*. In fact, regarding some competences, the opposite is shown: a decrease in the percentage of teachers who affirm letting students produce digital presentations and show they can evaluate information. Moreover, as education policies are a matter of the states in Germany, it is reasonable that regional differences appear, as the *Länderindikator* point out. Therefore, it is worth looking at the practices of individual states in more detail. Even though Thuringia has policies related to media education (see section 3.3, p. 40), including the teaching plan *Medienkunde*, its implementation in teachers' practice has not been researched until the author's study, to be presented in the next chapter.

4.4 Predictors of media education practices

Studies such as the ICILS and the *Länderindikator* show that there are differences in the intensity of teachers' efforts of fostering students' media-related competence. Therefore, it is relevant to contemplate the possible factors that are associated with some teachers putting greater effort into teaching on the subject of media, while others do little or do not do anything at all.

The conditions of the context are certainly important for teachers' practices of media education. However, besides the provision of frameworks and guidelines from the policy level (Chapter 3), the teacher is a decisive instance in education practices involving media. Therefore, understanding teachers' characteristics associated with the integration of

technology in class — i.e., teaching with media — has received a lot of attention in research. As proposed in the will skill tool model (Knezek et al., 2003), already mentioned in section 2.3.3 (p. 25), research findings recurrently point to teachers' positive attitude toward technology for teaching, their ICT abilities, and their access to technologies as predictors of their use of ICT for instruction.

Positive attitudes toward ICT refer to beliefs that ICTs contribute to the achievement of pedagogical goals and do not harm other important ones (Mishra et al., 2009; Zhao & Cziko, 2001), improve student learning (Agyei & Voogt, 2011; Ertmer & Ottenbreit-Leftwich, 2010; Papanastasiou & Angeli, 2008; Petko, 2012; van Braak et al., 2004; Wastiau et al., 2013; Williams et al., 2000), make teachers' job easier (Agyei & Voogt, 2011; Petko, 2012), and are important in developing students' media competences (Petko, 2012). Moreover, positive attitudes toward ICT can correspond to perceived enjoyment or feeling comfortable in using ICT (Agyei & Voogt, 2011; Papanastasiou & Angeli, 2008).

Teachers' abilities in ICT are usually measured in terms of self-efficacy, i.e., how competent teachers feel in using technology in their daily lives, for instruction in general, and for teaching students specifically about media and technology (Agyei & Voogt, 2011; Area-Moreira et al., 2016; Mishra et al., 2009; Papanastasiou & Angeli, 2008; Petko, 2012; Wastiau et al., 2013). In addition, other related measures such as received training or need for professional development in ICT have been adopted (Gil-Flores et al., 2017; van Braak et al., 2004; Vannatta & Nancy, 2004), with received training showing a positive association and need for training a negative association with use of technology for teaching.

Teachers' access to equipment, e.g., quantity of ICT available at school (Petko, 2012; Wastiau et al., 2013) or whether teachers can access equipment and internet in the school premises (Agyei & Voogt, 2011; OECD, 2015; Williams et al., 2000), can be considered an external element, i.e., a characteristic of the context in which teachers develop their practice, and not of teachers themselves. However, there are also scholars who approach the equipment factor not as an objective measure of what, how much, and how good equipment teachers have at their disposal at school, but as how teachers subjectively evaluate the sufficiency and quality of the equipment available to them (Gil-Flores et al., 2017; Zhao & Cziko, 2001).

In addition to attitudes, abilities, and access to ICT, other predictors of the practice are pointed out in research. For instance, exchanging experiences and resources related to the use of ICT for instruction with other teachers seems to influence teaching with technologies positively (Drossel et al., 2019; Ertmer & Ottenbreit-Leftwich, 2010; Gil-Flores et al., 2017; Papanastasiou & Angeli, 2008). Also, tested models frequently control for demographic characteristics such as age and gender, but significant results are rare. Area-

Moreira et al. (2016) found out differences in ICT use in the classroom in favor of older teachers. However, they attribute this result to teachers' longer professional experience, and assume that age per se is a less relevant variable. Regarding gender, van Braak et al. (2004) found that male teachers reported using computers for instruction more frequently in comparison to female colleagues in their sample of primary school teachers from the Dutch-speaking region of Belgium. In general, biological traits such as gender and age do not seem to be decisive in teachers' practices with media.

In comparison to the predictors of teaching with media, research has dedicated less attention to examining the associations with the practice of teaching about media. However, there are some investigations on factors related to developing specific competence areas. For instance, the ICILS derives a scale from its measures of teachers' emphasis on developing several students' competences related to computers and information (Table 4.1, p. 55). In the two editions to date of the study, a regression model is calculated including the emphasis scale as the outcome variable and the following predictors: teachers' ICT self-efficacy, positive views of using ICT for teaching and learning, reports on teachers' collaboration about ICT use, and perceptions on the available ICT resources in their schools. Additionally, years of experience in using ICT for teaching is an independent variable in the model of the ICILS 2018.

Results of the models calculated for the whole ICILS sample as well as for each country are reported (Fraillon et al., 2020; Fraillon et al., 2014). In both editions, ICT-related self-efficacy and collaboration associate positively and significantly with emphasis on developing students' CIL consistently in all countries. In addition, positive views of pedagogical use of ICT and experience with teaching with ICT appear as positive and significant predictors in all countries' models in the 2018 edition. In the ICILS 2013, the factor positive views of ICT use appears as a positive and significant predictor in the majority of countries, but not in all. Teachers' perceptions on the availability of ICT at the school where they teach are significant predictors only in the models of Lithuania, Russia and Turkey in 2013, and Chile and Kazakhstan in 2018. That is, perceptions on technology availability at school is not significantly associated with German teachers' emphasis on developing students' CIL in none of the ICILS editions. The 2013 model can explain 23% of the countries' average variance and 19% of the variance of the German sample, while the 2018 accounts for 27% of the variance in the ICILS average and 17% in Germany.

Two studies use the ICILS 2013 data of Norwegian teachers to investigate associations with efforts in fostering students' skills in computers and information. However, they build their outcomes variable differently from the original ICILS scale. Siddiq et al. (2016) identify three dimensions of competence types among the items that measure

teachers' emphasis: accessing, evaluating, and sharing/communicating. They found these three dimensions to be strongly correlated to each other. In consonance with the ICILS results, their model shows positive and significant correlations of ICT use for teaching and collaboration, perceived usefulness of ICT, and ICT self-efficacy for teaching with teachers' emphasis in fostering the three CIL competence types. Moreover, they found differences in teachers' emphasis according to their main subject taught. Teachers of sciences, mathematics and other subjects tend to report less emphasis in developing students' CIL in the three competence types in comparison to teachers of languages, arts and humanities. No significant associations were found with age and gender.

Hatlevik and Hatlevik (2018) also use Norwegian teachers' data, but focus on teachers' fostering of students' ability to evaluate digital information. Their outcome variable is a scale of ICILS items that measure teachers' emphasis in developing students' abilities specifically to check the relevance, credibility and accuracy of digital information. The model that they tested yields positive significant associations of teachers' emphasis on fostering students' evaluation of digital information with use of ICT in class and ICT self-efficacy for instructional purposes. Their model shows a strong relationship between the practices of using ICT for teaching and teaching about evaluation of digital information. In discussing their findings, Hatlevik and Hatlevik (2018) assume that teachers who use ICT for instruction tend to recognize more easily the relevance of students developing abilities related to digital information. They also remark that promoting teachers' use of ICT in education can contribute to fostering students' digital skills.

The 2017 edition of the *Länderindikator* also examines differences in distributions of the five teacher practices (Table 4.2, p. 57) according to school years of secondary school (5/6, 7/8, and 9/10), school types (Gymnasium and other schools that have lower secondary school), and subjects taught (science, technology, engineering and mathematics, i.e., STEM-related subjects and non-STEM, like German, foreign languages, and social sciences). Regarding the teachers that affirm practicing internet surfing with students and letting students show how they evaluate information credibility, the proportion of teachers in schools that are not a Gymnasium are higher. However, most differences were found between the school years. Explaining how to save information in a document and instructing students on how to create tables, graphs and texts are conducted mostly by teachers in the years 7/8, while letting students produce posters and presentation on a computer and show how they evaluate information credibility is practiced mostly by teachers in the year 9/10. No significant differences in distributions were found regarding subjects taught in any of the practices (Lorenz et al., 2017).

Lorenz et al. (2019) conducted an additional analysis of the *Länderindikator* 2015. The authors built a scale of teachers' efforts in fostering students' CIL with the five items

displayed in Table 4.2 (p. 57), and with structural equation modeling, they examine factors associated with the construct. The findings show a positive significant relationship between using ICT for instruction and fostering students' CIL. In their model, use of ICT for instruction is a mediator variable. However, their analysis shows that collaborating with other teachers on ICT-related issues has a positive and significant direct effect on fostering students' CIL, while teachers' satisfaction with their school's ICT equipment yields a negative and significant direct effect. Thus, they conclude that "frequency of ICT use does not act as a crucial mediator" (Lorenz et al., 2019, p. 925). That is, factors such as collaboration and teachers' satisfaction with school ICT can relate to the fostering of students' CIL, independently from the use of ICT in class.

Instead of looking at teachers' practice, other studies focus on how differences in competence in teaching about media-related aspects can be explained. For instance, Wu et al. (2022) tested factors associated with teachers' competence in developing students' information literacy (TCDSIL) through a survey with 9,909 primary and secondary school teachers in China. The outcome variable TCDSIL was measured by teachers' self-evaluation (e.g., "I can improve students' information awareness", "I can improve students' information ethics"). Therefore, it does not necessarily reflect teachers' practice in fostering students' information literacy. Their findings show teachers' and schools' characteristics as positive predictors, namely teachers' perceived usefulness of ICT, teachers' information self-efficacy, teaching at primary schools, availability of ICT resources for instruction at school, and a school's network bandwidth. Teachers' gender and age did not yield significant associations with TCDSIL.

Similarly, Claro et al. (2018) investigated teachers' ability to teach students how to solve information and communication tasks in a digital environment. They conducted a survey and a test with 828 Chilean primary and secondary school teachers. They calculated models of two dimensions of the outcome variable: "solving information, communication and collaboration tasks in a digital environment" and "developing a digital information product and guiding students to solve tasks in a digital environment". Also in this case, most of the outcome measures refer to teachers' digital information skills and do not refer to their practice. Age turned out to be a negative predictor of solving digital tasks, while years of experience in the occupation was found to be a positive predictor. Besides, teaching science-related subjects was associated with higher ability to teach students about the two dimensions.

To summarize, the examples of studies presented above illustrate that research to date has been able to connect certain teachers' professional and personal characteristics with the extent they engage in practices involving media. Among those characteristics, teachers' positive attitudes towards technology and ability in using ICT appear remarkably con-

stant as positive predictors. Divergently, the associations with ICT availability at schools, teachers' age and gender are not regular nor steady.

When focusing on associations with fostering students' media-related competences, collaboration among teachers on ICT topics turns out as a relevant factor. Further professional characteristics such as time of teaching experience, subject taught, type of school where the teacher works, and school years taught, have been included less often in research and show less conclusively associations with teaching practices involving media.

A point that becomes clear from the findings of the studies previously mentioned is the positive and significant relationship between using ICT for teaching and fostering students' media-related competences, indicating that the practices can complement each other. That is, it is possible that teachers purposefully adopt ICT as pedagogical tools to facilitate media education. In addition, competence development can happen as a side effect, as working with ICT as instruction tools in general require teachers and students to learn about certain aspects of the technologies for the pedagogical goals to be reached.

In terms of methods, the studies on teachers' efforts in developing students' media-related competences have the strength to use large samples of teachers through large-scale studies such as the ICILS and the *Länderindikator*. However, the studies concentrate on digital, computer and information competences, in a reduced scope of media and digital literacy frameworks. Thus, the competence areas addressed are not so diverse. For instance, competences in safe use and critical thinking related to media do not play a substantial role in the studies. Consequently, it is not clear whether the significant factors identified associate the same way with the fostering of different competence areas. This is one of the main points that the studies conducted in the realm of the present work address. These investigations are introduced in the following chapter.

Chapter 5

Proposed research and empirical work

Building on the concepts, frameworks, policies, and the reviewed research on media education previously presented, this chapter introduces the problems addressed and the research rationale adopted in the dissertation. The dissertation consists of a series of studies, which are published as the following five open access articles:

1. Berger, P. (2019). Who needs teachers? Factors associated with learning ICT skills from teachers in a multilevel analysis of the ICILS data. *MedienPädagogik*, 35, 116–135. <https://doi.org/10.21240/mpaed/35/2019.10.22.X>
2. Berger, P., & Wolling, J. (2019). They need more than technology-equipped schools: Teachers' practice of fostering students' digital protective skills. *Media and Communication*, 7(2), 137–147. <https://doi.org/10.17645/mac.v7i2.1902>
3. Berger, P. (2021). Influencing factors on teaching different facets of media and digital literacy. In M. Seifert & S. Jöckel (Eds.), *Bildung, Wissen und Kompetenz(-en) in digitalen Medien: Was können, wollen und sollen wir über digital vernetzte Kommunikation wissen?* (pp. 105–118). <https://doi.org/10.48541/dcr.v8.6>
4. Berger, P. (2020). Teachers' mediation practice: Opportunities and risks for youth media behavior. *Comunicar*, 64, 47–56. <https://doi.org/10.3916/C64-2020-05>
5. Berger, P. (2021). ICT use for teaching media literacy: A closer look at the relationships between teaching with and teaching about media. *Media Literacy and Academic Research*, 4(2), 6–24. <https://bit.ly/berger-mlar>

In addition to the publications, this chapter summarizes and provides further information on methodological procedures used in the studies, highlights the main findings, acknowledges shortcomings in the analyses conducted, and presents possible approaches that could be adopted in further analyses.

5.1 Problems addressed and research rationale

As presented in Chapter 2, the fields of media pedagogy and educommunication indicate points where media and education intersect: education about media, education with media, and education within the context of media. When applied to the teachers' role, these intersections can be identified in the practices of fostering students' media literacy, using media for instruction, and mediation of students' media use.

A considerable amount of research has been conducted to understand variations in teachers' media use for instruction. In comparison, less attention has been given to explaining variances in teachers' practice of fostering media education. The link between the two practices — teaching with media and about media — is frequently used as an argument in policies. Several initiatives justify the investments in school technology infrastructure with the aim of preparing students for jobs and life in media-dense and highly digital environments. Furthermore, a few studies found statistical associations between the two practices.

Nevertheless, as pointed out in Chapter 3, the media and digital literacy frameworks are usually comprehensive, consisting of competences in several areas. Moreover, using media for instruction can happen in several forms since educational technologies are very diverse, ranging from mere visualization assets to tools that offer students various interaction possibilities. Consequently, the association between the media use for instruction and developing students' media competence should not be oversimplified. As both practices have many facets, i.e., several media literacy competence areas and a variety of educational media, the assumption that using any kind of media for teaching leads automatically to the fostering of media competence as a whole is deceiving.

Furthermore, in the case of schools, media education is usually integrated in traditional school subjects. That is, the several competence areas of media literacy should be taught in the realm of other subjects, leaving it mostly up to the teacher to decide when, what aspects, and how much of media education will be taught in their classes. That is, policies may recognize the importance of developing citizens' media literacy and direct efforts to establish media education in formal schooling, but the teacher is a central figure between what is proposed in media education guidelines and what is in fact implemented in the classroom. Therefore, looking at what factors are associated with teachers putting effort into developing students' media-related competences may contribute in identifying what investments can be made to facilitate and strengthen media education.

Considering this, the research framework of the present work builds on three fundamental aspects (Figure 5.1). First, the framework considers the interplay of fostering students' media competences with the teaching practices of media use for instruction and mediation of students' media use. Second, it addresses the variety of media literacy com-

petences targeted in the efforts of teaching about media. Finally, for their protagonist role in the practices involving media in schools, it looks at teachers' characteristics and professional conditions as influencing factors of the media education practices.

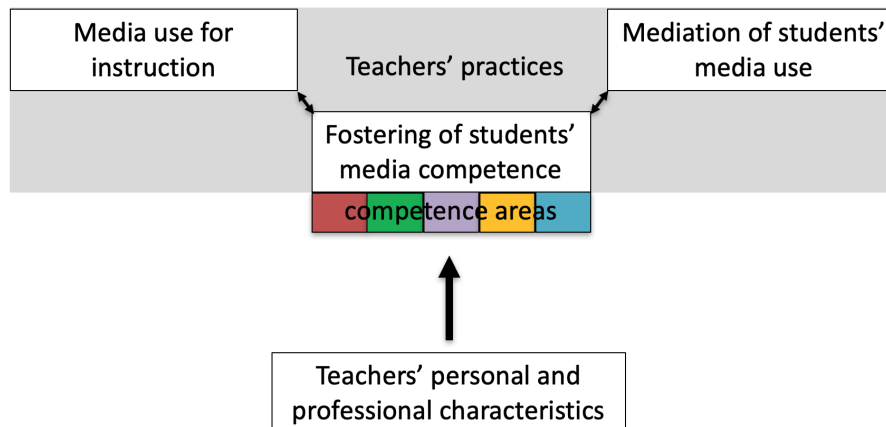


Figure 5.1: Elements of the research framework that examines teachers' media education practices (author's illustration)

In addition, it is well-known that many children start having contact with media products and digital devices at an early age and their media use tends to intensify as they get older. Adolescents are commonly considered eager media users, spending several hours a day in online activities. According to the latest Youth, Information, Media Study (JIM Studie), which surveyed 1,200 adolescents between 12 and 19 years old in 2020 in Germany, the average daily time spent online on weekdays is 212 minutes among those aged 12–13, 252 minutes for the ones aged 14–15, 264 minutes for 16-17 years-old group, and 306 minutes among the 18–19 years-old. In addition, 94% of adolescents report having their own smartphone and 72% a computer or laptop for their own use (Feierabend et al., 2020).

Thus, hypothetically, children and youth could be able to develop some media-related competences autonomously or from peers, due to their familiarity with the media. Moreover, the family is expected to play a role in media education, especially in terms of protective skills. In the face of this, it is pertinent to consider what is the contribution of school media education to the development of children and youth's media-related competences, or more precisely, what are the contributions of teachers as media educators. To address this topic, the first study takes students' characteristics into account and examines for whom teachers are especially relevant as media educators. Moreover, as shown in Figure 5.2, it considers the variations of contextual conditions for the development of media education in different countries (see section 4.2, p. 50) and the possible impacts they might have in students relying on teachers to develop media-related skills.

In summary, the thesis consists of a series of three studies that refer to the following

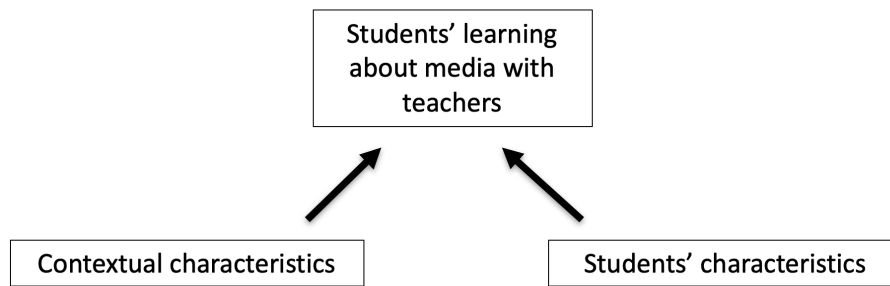


Figure 5.2: Aspects addressed in the first study (author's illustration)

research questions:

- RQ1 What aspects are associated with the student learning of media and digital skills with teachers?
- RQ2 What aspects are associated with the teaching of different media and digital competences in schools?
- RQ3 To what extent is the use of specific information and communication technologies associated with the fostering of specific media-related competences?

The three studies that constitute the dissertation employ quantitative data collected via surveys. Two data pools are used. The first study uses data of 14 countries that participated in the ICILS in 2013. Therefore, the study consists of a secondary analysis of already existing data. The two remaining studies apply data collected in 2017 in Thuringia in the context of a project funded by the Thüringer Ministerium für Bildung, Jugend und Sport, in which the author was working. The project consisted of an evaluation of the implementation of the *Kursplan Medienkunde* in secondary schools, which was published in a report (Wolling & Berger, 2018).

The studies that use Thuringian teachers' data presented in this work were elaborated after the project ended. Therefore, even though the data employed in the second and third studies were collected by the author, the studies can be also considered analyses of already existing data. The following sections provide information on the data used, the methodological procedures adopted, and the main findings of the dissertation studies. The foundations for the hypotheses tested and the description of how specific model variables were operationalized are provided in the individual published studies (see references on p. 64) and will not be repeated in the following sections.

5.2 Study 1: Factors associated with relying on teachers to develop digital competence

The first study (see publication “Who needs teachers?”, reference on p. 64) analyzes data of 14 participant countries in the ICILS 2013 to examine under what circumstances students refer primarily to teachers to learn about computer and information aspects of media literacy. The ICILS is conducted by the International Association for the Evaluation of Educational Achievement (IEA). Its first edition collected data in 2013 in 20 countries, and the second edition in 2018, in 13 countries. A third edition is planned for 2023. The ICILS conducts a test to assess 8th grade students’ proficiency level of computer and information literacy. In addition, it administers surveys with students, teachers, principals and ICT coordinators at the sampled schools.

Clean and well-structured data sets of the ICILS are publicly available on the website of the IEA. Even though the official reports (Fraillon et al., 2020; Fraillon et al., 2014) present meaningful findings of the study (see section 4.3, p. 55), the large amount of international data of students, teachers, and schools provided by the ICILS opens many possibilities for additional analyses to answer new questions. Furthermore, detailed reports of the data collection processes, the data operationalization, and the quality procedures adopted are available (Fraillon et al., 2014; Fraillon et al., 2015; Jung & Carstens, 2015), facilitating secondary analyses.

At the time of the preparation of the dissertation study, only the data collected in 2013 were available. Therefore, the students’, teachers’, schools’, and countries’ data of the first ICILS edition were used in the first dissertation study, which addresses the question: What aspects are associated with the student learning of media and digital skills with teachers? The ICILS 2013 drew representative samples of students and teachers via systematic random sampling in all countries (Jung & Carstens, 2015). The schools’ data consist of the data collected through the principals’ and ICT coordinators’ survey of the participant schools.

5.2.1 Sample and analysis

In this study, data of 14 countries that took part in the ICILS 2013 were used because some countries did not meet student sampling requirements, offering a risk for comparisons between countries (Jung & Carstens, 2015). Thus, while the total ICILS student sample consists of over 60,000 pupils from over 3,300 schools in 20 countries, the ICILS sample used in this study corresponds to 44,143 students from 2,497 schools in 14 countries (Table 5.1).

Table 5.1: Overview of the ICILS 2013 sample used in the dissertation study

Country	Participant schools (n)	Participant students (n)
Australia	311	5,326
Chile	174	3,180
Croatia	170	2,850
Czech Republic	170	3,066
Germany	136	2,225
Lithuania	162	2,756
Norway	138	2,436
Poland	156	2,870
Russia	206	3,626
Slovakia	167	2,994
Slovenia	218	3,740
South Korea	150	2,888
Thailand	198	3,646
Turkey	141	2,540
Total	2,497	44,143

ICILS students', teachers', and schools' data are available in separate data sets by country. For the analysis conducted for the dissertation, a single data set was built by combining student data with the school and country data. Due to the way that data are collected and organized in the ICILS data sets, it is not possible to incorporate teacher data to the individual students (Jung & Carstens, 2015). Therefore, aggregated teacher data, i.e., teachers' averages per school, were integrated at the school level. Consequently, the data set has students as units of analysis and contains data at three levels: student, school, and country.

The model tested in the study has "learning about computer and information literacy (CIL) from teachers" as the outcome variable, which corresponds to a measure at the student level. An ICILS survey question asks students who mainly taught them to perform five tasks: communicating over the internet, creating documents for school work, changing computer settings, finding information on the internet, and working in a computer network. Students could choose only one answer for each item, among the options "I mainly taught myself", "my teachers", "my family", "my friends", and "I have never learned this".

As shown in Table 5.2, students report having learned most skills by themselves, i.e., through autonomous learning. The only skill that had teachers as the main contributor, even before autonomous learning, is creating documents for school work. From the sample of the 14 selected countries, 44% of students affirm having learned primarily from teachers how to create documents for school work. The second competence in which

Table 5.2: ICILS 2013: Distribution (%) of students' reports on who mainly taught them five digital competences

Competences	Learned autonomously	Teachers	Family	Friends	Never learned
Creating documents for school	33	44	14	6	3
Working in a computer network	51	20	14	6	9
Changing computer settings	47	17	23	9	4
Finding information online	73	11	10	4	2
Communicating online	67	6	11	13	3

teachers were most cited as the main mentor, after autonomous learning and before the family, is working in a computer framework, corresponding to a fifth of the students' reports. When it comes to changing computer settings, 17% of students say teachers were who mainly taught them it.

Regarding finding information on the internet, the absolute majority affirms having learned it independently. Teachers and the family appear in secondary positions, indicated as the main contributor agent by 11% and 10% of students, respectively. Teachers are perceived as minor contributors in students' development of skills in communicating over the internet, as only 6% of students report having learned this mainly from teachers. In this particular skill, the contribution of peers is more often recognized than that of the family and teachers.

There is a clear tendency amongst early adolescents to perceive their development of certain skills as autonomous, notably related to the operation of computer networks, online communication, and online information. However, it is valid to observe that the students were asked to indicate the main agent who taught them the skills, which does not mean that a determined agent was the exclusive source of knowledge or training. Besides this, it is possible that students overestimate their own contribution in learning CIL.

Despite the majority reporting mainly independent learning, the first study seeks a closer look at the adolescents that indicate teachers as the primary agent from whom they have learned the five digital competences. Therefore, the outcome variable used in the analysis has a scale 0–5, in which 0 indicates that students learned none of the competences mainly with teachers, and 5 that all the five competences were learned mainly from teachers. As the distributions in Table 5.2 show, compared to the overwhelmingly majority that report autonomous learning, only a small group indicates teachers as the main contributor, reflecting in a modest mean of 0.97 (SD = 1.21).

Based on previous research related to the topic, hypotheses were developed about the impacts that students', schools', and countries' characteristics might have on the extent

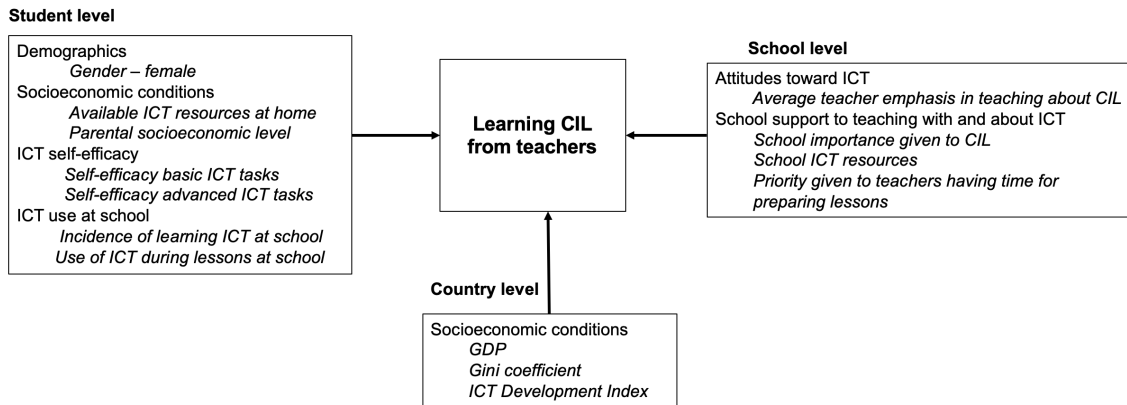


Figure 5.3: Research model of the first study (author’s illustration)

students rely on teachers to learn about CIL. Figure 5.3 shows the predictor variables at the student, school, and country levels. To account for the different levels of the data, a three-level hierarchical regression analysis was conducted. Multilevel analysis considers the levels at which the cases are structured, taking into account that the response variations can be attributed to some extent to the differences between the levels (Leckie, 2013). In the ICILS case, students (level 1) are nested within schools (level 2) that are nested within countries (level 3). That is, students that attend the same school have the same values for the school-related variables, and the ones who live in the same country have the same values for the variables at the country level.

Thus, with a three-level analysis, it is viable to take the group effect into account by partitioning the total variance into the between-group variance (differences of group means from the overall mean) and the within-group variance between individuals (individual differences from group mean) (Steele, 2008). This way, it is possible to consider that characteristics of the country where students live and the schools they attend might have an influence on their responses.

Before conducting the multilevel regression, a pre-analysis confirms whether a three-level model is a sensible choice. Therefore, a null multilevel model is fit, i.e., a simple multilevel model without predictor variables, but considering school and country effects on learning CIL from teachers. Then, a likelihood ratio (LR) test can verify whether the more complex models fit the data significantly better than the simpler models by comparing the null three-level model with null two-level models (one only for school effect and one only for country effects) and with a null single level model.

To test the null hypothesis that there are no country effects, a LR test can be conducted comparing the null three-level model with a null two-level model students within schools. To test the null hypothesis that there are no school effects, the comparison can be made between the null three-level model and a null two-level model students within

countries. Finally, the three-level model can be compared to a single-level model, testing the null hypothesis that there are no higher-level effects at all. The LR tests show that the three-level model is preferred to a single-level model ($\chi^2 = 8368.3$, $p < .001$), to a two-level students-within-schools model ($\chi^2 = 1510.9$, $p < .001$) and to a two-level students-within-countries model ($\chi^2 = 2306.5$, $p < .001$).

The three-level hierarchical regression analysis was performed with the packages “lme4” and “lmerTest” in R. First, predictors at the student level were inserted in the analysis, proceeded by the variables at the school level, and in the final step, by the predictors at the country level. Since the sample is very large, predictors that yield an extremely small effect could be significant. Therefore, only significant predictors that could contribute to the explained variance of the model (in the case, the ones that had an effect equal or above ± 0.01) were retained in each step.

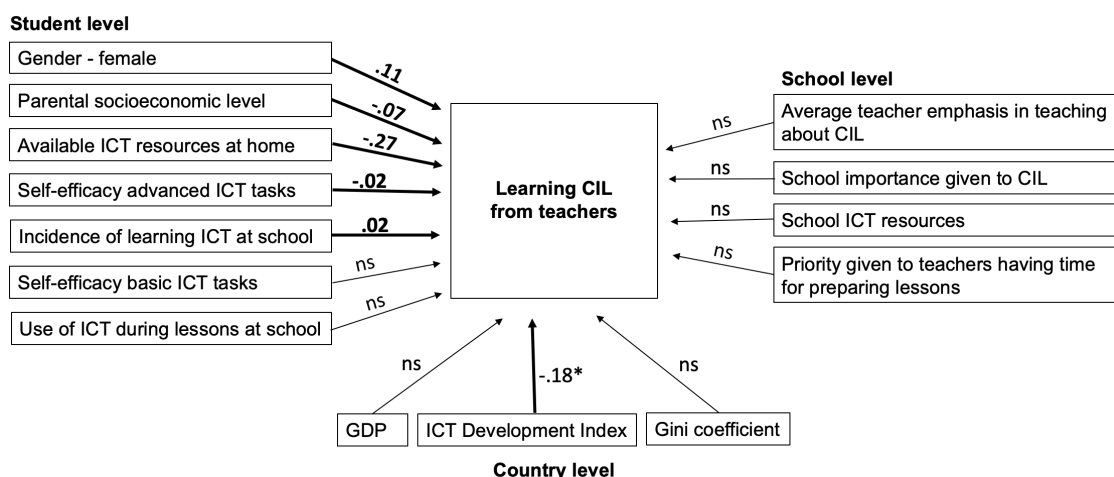
5.2.2 Findings

The three-level regression shows that mainly the predictors at the student level yield significant associations with learning digital competences from teachers. According to the findings (Figure 5.4), female students tend to rely more on teachers to learn CIL than their male peers. Conversely, teachers seem to have a less central role as CIL mentor for students who have access both to computers and the internet at home and whose parents have a higher socioeconomic condition in terms of education attained and occupation. Furthermore, the students who report higher confidence in their skills in advanced¹ CIL tasks tend to indicate teachers as their primary CIL mentor more rarely.

Even though the schools’ characteristics do not yield significant associations, the incidence of learning CIL mainly from teachers is likely to be a bit higher among students who report having received a more comprehensive CIL education at school, i.e., having being taught several tasks related to digital media at school. At the country level, the only significant differentiation is the level of technology penetration. Students in countries with a lower ICT Development Index score tend to rely more on teachers to learn about CIL. Thus, among the tested predictors, being integrated in an environment where digital media is less disseminated — countries with lower digitalization levels and homes with limited ICT resources — seems to be a prominent factor for students to look up to teachers to develop digital competences.

A school’s investments in promoting media education does not seem to have a direct connection with teachers being the protagonist in students’ CIL learning. On the other

¹The advanced tasks correspond to using software to find and get rid of viruses, creating a database, building or editing a webpage, changing the settings on a computer to improve the way it operates or to fix problems, using a spreadsheet to do calculations, store data, or plot a graph, creating a computer program or macro, and setting up a computer network.



Note: Coefficients in bold are significant at the .001 level; * = $p < .05$; ns = not significant.

Figure 5.4: Model of the first study with results of the three-level regression analysis (author's illustration)

hand, schools' support to media education should lead to increased opportunities for students to learn about media and digital literacy at school, and having the opportunity to learn CIL at school is especially relevant for those who rely on teachers to develop digital skills.

The incidence of learning about ICT at school has a small association with learning CIL mainly from teachers. Conversely, using ICT during school classes does not. This suggests that the mere technology use as an instrument in lessons is not enough for students recognizing it as CIL learning. Thus, the teacher instruction about aspects of technology is essential for students' perception of teachers' contributions as media educators. Furthermore, different from home and country ICT access factors that associate negatively with learning CIL mainly from teachers, having access to ICTs at school does not have an impact. While having access to ICT outside the school gives students opportunities to learn CIL autonomously or through exchanges with family and friends, ICT use at school does not seem to offer equivalent chances.

5.2.3 Limitations and possible approaches for further analysis

Being able to analyze a large amount of students' data from different schools and countries is a tremendous advantage of the secondary analysis of ICILS data. Nevertheless, analyzing data that already exists imposes shortcomings since the research needs to be adapted according to the available data instead of collecting data according to the research needs. One of these shortcomings is the nature of students' and teachers' data in the ICILS.

The first study aimed at finding out under what circumstances students tend to rely on teachers to develop digital competence and performs the only analysis of students' data in the dissertation. The studies that follow focus on the teacher's perspective to investigate the circumstances that are associated with teachers' practice of fostering students' media-related skills. In the first study, no substantial association could be found between these two perspectives: teachers' efforts in teaching CIL and students' perception of having learned CIL mainly from teachers. However, the nature of the data might have limited a more accurate analysis of this association. As in the ICILS data, it is impossible to connect individual teachers to individual students; only teacher averages per school could be calculated. A school average might misrepresent important variations in individual teacher's emphasis in promoting media education. Therefore, it would be optimal if data from students and teachers who are together in classes could be paired.

Moreover, students' perception of learning computer and information literacy with teachers is limited to five competences related to digital media. For instance, competences related to critical evaluation and safety issues are not directly addressed. It is possible that operational competences, such as working in a computer network and changing computer settings, and usage competences, like finding information and communicating online, are more susceptible to being developed autonomously if students have regular access to the necessary technologies. However, the contribution of teachers might make a difference when it comes to evaluating critically the information found online, reflecting on implications of certain behaviors in the online communication, and verifying settings that can be used to protect private data, for instance. It would be ideal if data were available on students' perspective on teachers' contributions in relation to a broad pool of media and digital competences.

As previously mentioned, by the time of the preparation of the study, only the data of the ICILS 2013 were available. In the meantime, more recent data of the 2018 study are available. In the 2018 study, the student questionnaire includes one more competence indicator to measure from whom students primarily learned CIL skills, namely creating or editing digital presentations. As Table 5.3 shows, the strongest contribution of teachers appears precisely in this additional indicator, as over half of the students report having learned how to make digital presentations primarily from teachers.

Although similar to the 2013 results (see Table 5.2, p. 70), students tend to report autonomously learning in many computer and information aspects, the overall distributions are slightly more balanced in the ICILS 2018. Furthermore, access to technologies at the individual and the country levels resulted as relevant predictors in the study presented. Nevertheless, it is likely that the general access to ICTs increased between 2013 and 2018. Thus, to verify the relevance and stability of the model in the face of these changes, it is

Table 5.3: ICILS 2018: Distribution (%) of students' reports on who mainly taught them six digital competences

Competences	Teachers	Family	Friends	Learned autonomously	Never learned
Creating or editing digital presentations	51	16	5	22	5
Creating or editing digital documents	46	21	4	23	6
Using programs and files in a computer network	31	23	5	37	5
Changing settings on an ICT device	19	25	6	41	9
Finding information online	9	19	3	68	1
Communicating online	3	26	13	56	2

pertinent to replicate the analysis with the latest data.

Regarding the model tested, the outcome variable is skewed, as the great majority of students tend to report autonomous learning as the primary source of CIL development. In this case, taking logarithms of the variable scores does not remedy the distribution. However, as the results of the three-level regression are plausible and can be interpreted, they are worth considering.

Moreover, the analysis conducted in the study assumes fixed predictor effects across countries and schools. However, it is likely that the effects of some predictors might actually differ across higher-level units. To address this, one possible approach would be including random coefficients in the analysis. In this case, the multilevel regression model would be extended with extra parameters to accommodate random predictor coefficients at the school and the country level. For instance, a model could be fit to allow the effect of gender to vary across schools and countries. The likelihood ratio (LR) test can verify whether the model with the random gender effect fits the data significantly better than the model with only fixed effect. In this case, the LR statistic is 291.5 on 6 degrees of freedom. Comparing these values against the 5% point of the chi-squared distribution for the respective 6 degrees of freedom, which is 12.59, the LR statistic presents strong evidence that the gender effect varies across countries and schools.

The random effects approach, however, adds great complexity to the model, especially when there are several predictors involved and their random effects are considered. Thus, a reasonable interpretation of the coefficient results of such model is highly demanding. Also, a thorough interpretation of differences between countries requires a better understanding of context elements, including cultural aspects. For instance, differences regarding the effect of gender on relying on teachers to learn about computer and information

literacy aspects may be related to gender (in)equality levels in countries. In general, inequalities in social conditions between women and men can be identified in practically all countries. However, some societies seek to reduce gender inequality through policies and initiatives, while in others, female and male roles remain rigidly differentiated. Cultural values based, for example, on traditions or religion can contribute to differences concerning freedom and stimuli given to girls and boys, also in relation to technology use.

Moreover, cultural aspects can relate to differences between countries concerning the recognition of teachers as digital competence mentor. The economical and development indexes adopted in the analysis — GDP, Gini inequality coefficient, and penetration of digital technologies — are very limited in explaining differences at the country level. Particular societal values regarding the roles of authority and influence attributed to teachers can certainly play a meaningful role.

5.3 Study 2: Factors associated with teachers' fostering of students' media competences

The subsequent study focuses on teachers' engagement in media education. Therefore, it uses survey data of a study that evaluated teachers' promotion of students' media literacy in the realm of the project "Evaluation of the implementation of the *Kursplan Medienkunde*" in the state of Thuringia. The strength of the data is that it measures the frequency in which teachers promote a broad array of media-related competences in different areas, addressing the comprehensiveness of media literacy frameworks.

The project "Evaluation of the implementation of the *Kursplan Medienkunde*" was funded by the Thüringer Ministerium für Bildung, Jugend und Sport (TMBJS) and lasted from 2016 until 2018. The goal of the evaluation was examining how media education was being developed in secondary schools, especially how the *Kursplan Medienkunde* was being implemented. Therefore, the project aimed to inform the policy level on the conditions under which teachers were developing media education practices in their schools, to what extent they engaged in activities that fostered the competences prescribed in the teaching plan, and their opinions on several aspects of media education.

The evaluation study used different methods to collect data, namely qualitative interviews with school principals, qualitative expert interviews, a quantitative survey with teachers, a quantitative survey with school principals, and three case studies of best-practice schools. The best-practice schools were suggested by the TBMJS, corresponding to schools that the Ministry considered were conducting good work with media. The case studies consisted of observations, interviews with teachers, principals, and students, and analysis of documents and were conducted at the final phase of the evaluation project.

The first steps of data collection consisted of four qualitative interviews with principals and teachers involved in the implementation of the *Kursplan Medienkunde* in secondary schools (two *Regelschulen*, two *Gymnasien*) in the city of Ilmenau, located in the center of Thuringia and home of the university in charge of the project. Then, expert interviews were conducted with representatives of three relevant institutions in the media education context in Thuringia: the Thüringer Landesmedienanstalt (TLM), the Thüringer Institut für Lehrerfortbildung, Lehrplanentwicklung und Medien (ThILLM), and the Thüringer Landesbeauftragten für den Datenschutz und die Informationsfreiheit (TLfDI). The TLM and ThILLM play an important role in the media literacy training of in-service teachers, while the TLfDI concerns all matters related to data protection in Thuringia, also in the realm of schools. These initial interviews served the purpose of informing the main phase of data collection, which was the teacher survey. From the data collected in the interviews, categories were derived to make sure that important aspects of the implementation of media education in schools would be covered in the teacher survey.

Moreover, the interviews with schools indicated that the school principals' attitudes toward media literacy and technology use are crucial for the media education work at schools. Therefore, it was decided to administer a survey with principals parallel to the teacher survey. The principals' questionnaire consists of questions about opinions about the *Kursplan Medienkunde*, the media education efforts of the school, the implementation of the *Kursplan Medienkunde* at the school, and the schools' conditions for the development of media education in terms of technology, teachers' skills, teachers' time capacity, support from institutions in the state, media education training possibilities, and didactic resources available.

The teachers' questionnaire is considerably more comprehensive than the principals' questionnaire. For instance, the competence items correspond to 28 competences prescribed in the *Kursplan Medienkunde* and one item related to transmedia navigation and multitasking, to address more explicitly the characteristics of timely digital media use (Jenkins et al., 2009). A total of 29 competence items were used in measures of teachers' opinion on their relevance, frequency in which teachers conducted activities in class to foster the competences, and the extent teachers estimated student have developed the competences. The questionnaire addresses teachers' media use for instruction with a number of items on the frequency in which teachers use 12 different media resources and technologies. Moreover, teachers were asked about their perceptions of the efforts dedicated and the conditions available to promote media education in their schools, the training they have received on media use and media education, their opinions on different aspects of media education, and personal and professional information. The original questionnaires in the German language distributed to teachers and principals can be found in Wolling

and Berger (2018). An English version of the teachers' questionnaire is available in the Appendix (p. 125).

From a list of all secondary schools in Thuringia, in which the *Kursplan Medienkunde* is supposed to be applied (442 by the time), a random sample of 88 schools was drawn. In May 2017, the TMBJS communicated to the regional school offices [*Schulämter*] about the distribution of the questionnaires in the realm of the evaluation project, who then wrote an official communication to the sampled schools. Afterwards, the school principals of each school were contacted to participate in the principals' survey. Also, they were asked to distribute the teachers' survey among the staff of their schools since it was not possible to have access to teachers' direct contact details. From the 88 contacted schools, 13 explicitly refused to take part in the survey. In agreement with the TMBJS, another 13 schools were randomly chosen to replace them in the sample.

Initially, the distribution of both questionnaires happened online. Both questionnaires were anonymous. The principals received two separate emails: one invitation with the link to the principals' survey, and one request to forward the survey link to their school teachers. In addition, the questionnaires were sent in PDF files attached to the respective emails. Thus, participants had the possibility to answer the questionnaire either online by clicking on the link or printing the PDF document, filling it and sending it back as scanned copy or by post. From June 26th until August 9th 2017 there were summer school vacations. As by August 2017, the survey response was still low, printed questionnaires with a pre-stamped response envelope were sent to the sampled schools. The online questionnaires could be accessed until September 20th, 2017.

In the end of the data collection period, 51 principals and 315 teachers answered the respective surveys, corresponding to response rates of 58% for principals and 12% for teachers. From the teachers' final sample, circa 60% of the responses came in the form of filled paper questionnaires by post. Possible reasons that hindered a more expressive teacher participation rate are the length of the questionnaire (estimated between 15 and 30 minutes for completion), the lack of possibility of contacting teachers directly, and the time of the survey distribution, between the end of a school year, the summer vacations, and the beginning of the new school year.

The author was involved in all phases of the project, participating actively in the data collection. As the primary goal of the evaluation study was providing information to the policy-making level (e.g., TMBJS), the outcome was the report by Wolling and Berger (2018), where the results of the different data collection phases are presented mainly descriptively. Therefore, using the quantitative data collected from 315 teachers for the subsequent studies prepared in the realm of this dissertation made it possible to conduct deeper analyses, exploring different aspects of teachers' practices of fostering the compe-

Table 5.4: Characteristics of the teacher sample of the evaluation study of the *Kursplan Medienkunde* and the teacher population in Thuringia for the school year 2016/2017

Characteristic	Sample	Thuringia
Female	72%	78%
Male	28%	22%
Up to 29 years old	6%	5%
30–34 years old	10%	6%
35–39 years old	6%	4%
40–44 years old	4%	4%
45–49 years old	17%	14%
50–54 years old	21%	25%
55 years old or older	38%	41%

Note: Author's presentation based on Wolling and Berger (2018, p. 62).

tences prescribed in the *Kursplan Medienkunde*. A notable strength of the *Medienkunde* evaluation data is that it measures teachers' engagement in developing with their students 29 competences in different areas. Thus, it addresses the broad competence scope of media literacy frameworks, which is rarely the case in the studies of media education practices.

5.3.1 Sample

The study that uses the *Kursplan Medienkunde* teacher data focuses on testing factors that are associated with teachers' efforts in developing students' media and digital competence. The data refer to a sample of 315 school teachers in Thuringia, in which 72% are female and the majority (59%) are 50 years old or older. When comparing the age and gender of the sample with the characteristics of the teacher population in Thuringia for the period, there is a close approximation (Table 5.4). Thus, on one hand, the sample is a good representation of teachers in Thuringia. On the other hand, 84% of the participant teachers affirm being involved with implementing the *Kursplan Medienkunde*. In contrast, school principals report that on average, 40% of teachers in their schools are involved with the *Kursplan Medienkunde*. Consequently, there is a substantial degree of self-selection in the survey sample, as mostly teachers that are familiar with the *Kursplan Medienkunde* tended to participate in the study.

The biggest group (42%) within the respondents teach in *Regelschulen*, a type of secondary school in Thuringia that has until the 9th or 10th grade, whose certificate may qualify students to pursue vocational training or complement their secondary school in a *Gymnasium*. The second biggest group (36%) is composed of *Gymnasium* teachers. One of the main emphases of *Gymnasium* schools is the preparation for academic studies

in the 11th and 12th grades, strongly oriented by the exams that count for admission in higher education programs (*Abitur*). Completing the sample, 9% of the respondents teach at a *Gemeinschaftsschule* (a more flexible school type, ranging from the grades 1–12 or 5–12), 9% at a *Gesamtschule* (a type of secondary school in which students can complete their studies after the 9th, 10th or 13th grade), and 5% at a *Förderschule* (for students with special needs).

5.3.2 Analysis

The study addresses the second research question: What aspects are associated with the teaching of media and digital skills in schools? Therefore, linear regression analyses are conducted to verify the factors that can predict the efforts teachers dedicate to promoting students' media competences. The series of analyses conducted reflect the process of model development and are presented in three publications (see references 2–4 on p. 64). Considering the shortcomings realized and the improvements made during the model development process, a final model is proposed, which is presented in the findings section (5.3.3).

Taking into account the comprehensiveness of media literacy frameworks, the study tests models for the teaching of different areas of media competence. As competence areas can be approached in different ways, two strategies were adopted to build the outcome variables in the tested models: firstly, according to six different competence areas of the *Kursplan Medienkunde* as proposed by Wolling and Berger (2018), and secondly, by approximating the concept of teaching about media literacy with the concept of mediation of students' media use. In this case, the outcome variables correspond to two competence areas, namely mediation of risks and mediation of opportunities in students' media use.

The outcome variables are derived from the measures of teachers' frequency in engaging in class activities that foster students' 29 competences. In the first approach, all 29 indicators are used, distributed according the six theoretical constructs of competence areas proposed by Wolling and Berger (2018): private media use, information, media influence on society, practical technology use, online communication, and online safety and privacy protection. Table 5.5 presents the indicators that compose the scale of fostering each competence area and the respective scale reliability coefficient (Cronbach's alpha).

In the second approach, from the 29 items that measure competences fostered, the ones that could address risks and opportunities in conduct, content, and contact — the dimensions proposed by Livingstone and Haddon (2009) — were selected. Then, a principal component analysis with Varimax rotation was conducted to verify whether the dimensions of risks and opportunities were plausible. The results endorse the two dimensions, and indexes were built for mediation of risks and mediation of opportunities, as shown in

Table 5.5: Overview of measure items that compose the scales of teaching six media competence areas (outcome variables)

Competence areas (Cronbach's alpha)	Measured competence items
Private media use (.84)	Choosing adequate media for specific purposes Distinguishing between real and virtual identities Evaluating the danger of media addiction Prioritizing attention when multitasking with media Reflecting critically on own positive and negative communication experiences
Information use (.83)	Filtering and interpreting information from different sources Judging the credibility of different information sources Providing sources of information correctly Searching for information effectively Using online content in observation to copyrights
Media influence on society (.86)	Differentiating between advertising and journalistic content Evaluating the potential effect of violence in the media Understanding the influence of media in society Understanding the meaning of media for the job market Understanding why different actors present facts in different ways
Practical technology use (.89)	Differentiating between different data formats and using them with the right programs Implementing format principles for print media Making calculations with a spreadsheet program Presenting data in graphics and in tables Presenting work results in a digital presentation Producing digital media outputs creatively Using technical terms correctly
Online communication (.80)	Choosing media adequately to communicate with different partners Following the adequate norms for online communication Using media in cooperation with others for achieving common goals
Online safety & privacy protection (.89)	Dealing properly with cyberbullying Protecting own data and private sphere effectively Surfing safely on the internet Understanding how personal data is gathered and used further while using online media

Note: Author's illustration based on Wolling and Berger (2018, p. 56).

Table 5.6. Only one item that was expected to load under opportunities turned out to load under risks and was excluded from the index.

Table 5.6: Overview of measure items that compose the scales of mediation of opportunities and mediation of risks in students' media use (outcome variables)

Competence areas (Cronbach's alpha)	Measured competence items
Mediation of opportunities (.86)	Choosing adequate media for specific purposes Choosing media adequately to communicate with different partners Filtering and interpreting information from different sources Producing digital media outputs creatively Searching for information effectively Using media in cooperation with others for achieving common goals
Mediation of risks (.92)	Dealing properly with cyberbullying Differentiating between advertising and journalistic content Evaluating the danger of media addiction Protecting own data and private sphere effectively Surfing safely on the internet Understanding how personal data is gathered and used further while using online media Using online content in observation to copyrights

Note: Author's illustration

The model was developed in a process, which is shown in Table 5.7. The first version of the model was tested for the fostering of only one competence area, namely on-line safety & protection of privacy protection (see publication "They need more than technology-equipped schools", reference on p. 64). Based on findings of previous studies and considering the measures available in the data, hypotheses were stated² and the following predictors were selected: teachers' attitudes toward the competence area, preparation for media education (training and acquaintance with relevant media education guidelines³), satisfaction with school resources (organizational and technological), ICT use in class, subject taught, school type, and age.

²See the publications referenced on p. 64 for the references adopted for selecting predictors and the hypotheses stated.

³The Thuringia Education Plan until age 18, the *Kursplan Medienkunde*, the internal media education teaching plan of their respective school, their respective school's certificate that attests what media and digital literacy content students were taught.

Table 5.7: Study 2: Process of model development to test factors associated with teaching media-related competence areas

	Version 1	Version 2	Version 3
Outcome (Competence areas)	Safety & protection	Private media use Information use Online communication Practical technology use Media & society Safety & protection	Opportunities Risks
Predictors	Importance competence area Knowing teaching plans —— Training (formal / autonomous) Satisfaction school human resources Satisfaction school ICT resources ICT use for teaching Subject taught (relevance) School type (Gymnasium) Age —— ——	Importance competence area —— Compatibility with subject Training (formal, scale 0–3) Collaboration (scale 0–3) Satisfaction school ICT resources ICT use for teaching Subject taught (STEM) School type (Gymnasium) —— —— ——	Importance competence area —— Training (formal, scale 0/1) Collaboration (scale 0/1) —— ICT use for teaching Subject taught (STEM) School type (Gymnasium) Age Gender (male) Private media use
Publication	Berger and Wolling (2019)	Berger (2021)	Berger (2020)

Note: —— predictor not included in the model version.

To test the model with each of the six competence areas of the *Kursplan Medienkunde* proposed by Wolling and Berger (2018) as outcome variables (see publication “Influencing factors on teaching different facets of media and digital literacy”, reference on p. 64), some changes in the predictors were made. Aiming at having a more parsimonious model, only training was kept as an indicator of teachers’ preparation in media education. Training was chosen over the measure acquaintance with media education guidelines for being considered a more meaningful indicator of preparation. Also, the scale of training was operationalized differently. In the first version, the scale represented having learned about media education aspects autonomously (-4) to having learned it via formal pre-service or in-service training (+4). The problem of this scale is that for each aspect measured, respondents could choose more than one answer. For example, they could indicate that they learned how to teach students about media both autonomously and in formal training. Thus, in building the composite scale, someone who learned an aspect both autonomously

(-1) and formally (+1) would get a score of 0, the same of a person who did not learn the aspect at all. Therefore, to simplify the interpretation, in the second model, the measure refers only to having received formal training.

Moreover, the scale of satisfaction with school organizational resources has been substituted. In the first version, the measure corresponds to a composite scale of a teacher's satisfaction with the principal's support, collegial support, and time available to attend training related to media education. In the second version, a scale of learning about media education through collaboration with colleagues was adopted instead since it appears as a relevant factor in the literature. The last operationalization change occurs in the measure of subject taught. In the first version, the scale was built with subjects considered more related to media and digital literacy, according to the judgement of the author: German language, geography, history, and ethics, economy and law, economy and environment, informatics, religion, social studies, and humans, nature, and technology. Thus, the second version of the model adopts teaching STEM subjects as a more established category of school subjects.

Furthermore, the second version of the model focuses on teachers' professional characteristics. Therefore, age is left out of the second model. While the indicator teachers' attitudes toward the respective areas has been kept, a second attitude variable has been inserted, namely perception of compatibility of media literacy topics with the contents of the subject taught. It was considered pertinent to test this predictor since teachers in Thuringia should integrate contents of the *Kursplan Medienkunde* in the classes of the regular subjects they teach. The scales of perception of school ICT resources, ICT use in class, and school type remain unaltered.

In the third version of the model (see publication "Teachers' mediation practice", reference on p. 64), besides the differences in the outcome variables — mediation of risks and mediation of opportunities in students' media use, the model tested has some changes in the predictors, as well. The measures of having received formal training in media education and having learned about media education through collaboration with colleagues are operationalized in binary scales (yes/no). It was considered more meaningful for interpreting the difference between having received training or not and engaged in collaboration or not (the binary scale) than the number of media-related aspects in which one has received training and engaged in collaboration (values 0–3 in the second version).

The third version of the model excludes perception of school ICT resources as predictor since it did not yield significant associations in the previous model versions. For parsimony, the additional attitude indicator "perceived compatibility with subject taught" was left out. On the other hand, the third version includes teachers' personal characteristics, namely age, gender, and private digital media use. The scales of attitudes toward

the respective competence areas (mediation of risks and opportunities), ICT use in class, teaching STEM subjects, and school type are equivalent to the ones used in the previous version.

After analyzing these three model versions that use outcome variables based on theoretical constructs and modifications in the predictors, a final model is proposed. This model takes the empirical constructs of the outcome variable. As for the predictors, it sticks to the ones considered relevant throughout the process of model development. The final model is presented in the end of the findings section.

5.3.3 Findings

This section presents the results of the regression analyses of the three model versions and points out the limitations of each. Then, responding to the acknowledged limitations, a final model version is presented. Before examining the results of the regression analyses, Table 5.8 presents the averages of the indexes of the outcome variables, i.e., teachers' emphasis on developing students' competences in different areas.

Table 5.8: Average teachers' intensity of conducting activities to foster students' media competence in different areas

Competence areas	Mean(SD) Scale 1–5	Items	Cronbach's alpha
Information use	3.59(0.75)	5	.83
Private media use	3.36(0.74)	5	.84
Safety & protection	3.29(0.95)	4	.89
Media influence on society	3.22(0.79)	5	.86
Online communication	3.00(0.86)	3	.80
Practical technology use	2.79(0.85)	7	.89
Mediation of risks	3.34(.086)	7	.92
Mediation of opportunities	3.26(0.74)	6	.86

In the scale, higher values indicate higher emphasis dedicated to fostering students' competence in teachers' activities in class. From the six competence areas proposed by Wolling and Berger (2018), information use is the one that receives the highest attention in teachers' practices of media education in Thuringia. In contrast, teachers tend to engage less intensively in activities that aim to develop students' competences in operating ICTs, as the area practical technology use has the lowest average. When the fostering of students' competences is approached as mediation of risks and opportunities in media use, the average teacher engagement in the former is slightly higher than the latter.

Throughout the three model versions tested (Table 5.9), the intensity in which teachers use ICT in their classes and deeming as important that students develop competences in the respective areas consistently appear as significant and positive predictors of teachers' efforts dedicated to fostering students' competences in all areas.

In addition, the main school subjects for which teachers are responsible are associated with the incidence in which they conduct activities to develop students' competences. Professionals who teach STEM subjects tend to engage less in activities that aim to foster students competences in most media literacy areas. The exception is the area of practical technology use, which associates with teaching STEM. While fostering students' safety and protective skills is not predicted by teaching STEM, the results of the first model version show that it associates positively with teaching subjects that can easily integrate topics of media education, e.g., German language, geography, history, and ethics.

Moreover, teachers working in a school of the type *Gymnasium* tend to put less effort into fostering students' competences in all areas, except private media use, which does not exhibit a significant association. Consistent results can be also observed regarding the effects of teachers' perception on the technical resources available in their schools: it does not associate significantly with teaching any media and digital competence area.

The effects observed for the remaining predictors vary, for instance, having received in-service or pre-service training related to media education and having learned about ICT and media literacy through collaboration with colleagues. Pre- or in-service training associated positively with fostering students' online safety skills in the first model, in which the scale confronts autonomous learning with formal training. When training is measured in a scale that represents in how many media education aspects teachers were formally trained, a positive significant association appears only with the area of information competence. Finally, when training is measured in a binary scale indicating having received formal training or not, it associates positively with mediation of opportunities in students' media use. The variety of ways in which the measure was inserted in the different models challenges a consistent interpretation of the effects of formal training.

A similar issue happens with the measure of collaboration. As a measure of how many aspects of media education teachers learned through collaboration with colleagues, it predicts positively and significantly the teaching of competences in the areas of private media use, online communication, and online safety. When measured on a binary scale indicating whether collaboration with colleagues in relation to media education has taken place or not, it associates significantly and positively with mediation of both risks and opportunities in students' media use. From the possibilities tested, the binary scales are considered the best approach for being a clearer measure.

Table 5.9: Overview of linear regression results of the different model versions tested in Study 2

Predictor	Version 1			Version 2				Version 3		
	Safety	Private	Information	Communication	Practical	Society	Safety	Risks	Opportunities	
Importance competence	.30***	.38***	.36***	.27***	.18***	.45***	.35***	.26***	.27***	
Subject compatibility	—	n.s.	.12*	n.s.	.10*	n.s.	n.s.	—	—	
Knowing teaching plans	.16**	—	—	—	—	—	—	—	—	
Training (formal / autonomous)	.11*	—	—	—	—	—	—	—	—	
Training (formal, 0–3)	—	n.s.	.10*	n.s.	n.s.	n.s.	n.s.	—	—	
Training (formal, 0/1)	—	—	—	—	—	—	—	n.s.	.16**	
School resources: Human	n.s.	—	—	—	—	—	—	—	—	
School resources: ICT	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	—	—	
Collaboration (0–3)	—	.15***	n.s.	.13**	n.s.	n.s.	.13**	—	—	
Collaboration (0/1)	—	—	—	—	—	—	—	.12*	.15**	
ICT use	0.35***	.47***	.43***	.53***	.60***	.38***	.41***	.48***	.53***	
Subject taught (relevance)	.10*	—	—	—	—	—	—	—	—	
Subject taught (STEM)	—	-.18***	-.18***	-.14**	.12**	-.21***	n.s.	-.13*	-.10*	
School type (Gymnasium)	-.17***	n.s.	-.13**	-.11*	-.10*	-.14**	-.19***	-.12*	-.15*	
Age	.15**	—	—	—	—	—	—	.21***	n.s.	
Gender: Male	—	—	—	—	—	—	—	n.s.	n.s.	
Private media use	—	—	—	—	—	—	—	n.s.	n.s.	
R ²	.48	.41	.49	.43	.57	.40	.40	.51	.52	
N	275	285	267	272	271	298	282	231	231	

Note: * p < .05, ** p < .01, *** p < .001, n.s. not significant, — predictor not included in the model. Standardized coefficients are displayed (beta). Only results of the final models containing significant predictors are displayed.

Teachers' perceptions on the compatibility of the topics of the *Kursplan Medienkunde* with the content of the school subject taught by the teacher associated positively with the competence areas information use and practical technology use. Knowing relevant documents related to media education in Thuringia was included as predictor only in the first model version and yields a positive association with teaching students about online safety. However, when interpreting the finding, the contribution of this predictor to understanding what aids teachers' practice of fostering media education was considered limited, as teachers engaged in media education are expected to be acquainted with the pertinent guidelines. Therefore, it was not adopted in further models.

Teachers' private media use and gender were tested as predictors only in the mediation models and deliver no significant associations. However, age predicts positively and significantly teaching students about safety (first model version) and mediation of risks in students' media use (third model version). It could be pertinent to include age and gender as controls in all competence models. As the outcome variables in the tested models have been developed based on theoretical constructs, it is also pertinent to empirically search for underlying constructs in the items that measure teachers' emphasis in fostering students' competences. Therefore, a principal component analysis is conducted to find groups of variables possibly distinct from each other, i.e., the variables are correlated within the group, but the groups are possibly uncorrelated, and together, these groups account for maximum variance in the data (Stevens, 2002).

A scree test suggests that three components should be extracted from the 29 items that measured teachers' fostering of students' competences. Table 5.10 shows the loadings of each competence measure in the components, which together account for 61% of the variance in the data. According to the loadings, it is possible to interpret that the first component corresponds to a set of competences related to analytical, critical, evaluative, and protective skills concerning aspects mainly related to the everyday, private media use. Therefore, the competence area is labelled as "reflective private media use". The second area can be referred to as "productive goal-oriented media use" since it consists of competences that seek the purposeful use of media to produce results, with skills that are relevant for the effective use of media for school work, for instance. Finally, the third component corresponds to competences in operating tools and dealing with devices. Since it resembles the practical technology use area, already approached in the previous analysis, the same term is kept to label the component.

This interpretation of the components finds support in the literature. The three resulting empirical components approximate to the differentiation made in the OECD content curriculum mapping framework (OECD, 2019) between media literacy and ICT/digital literacy (see p. 50). In the OECD framework, media literacy focuses on analysis and re-

Table 5.10: Empirical constructs of teaching media competence areas: Results of the principal component analysis

Competence items	Components			Uniqueness
	Reflective private media use	Productive goal-oriented media use	Practical technology use	
Evaluating the effect of violence in the media	.79			.33
Evaluating the danger of media addiction	.77			.35
Protecting data and private sphere effectively	.74		.44	.36
Differentiating between advertising and journalism	.74			.26
Distinguishing between real and virtual identities	.73			.39
Dealing properly with cyberbullying	.71			.28
Understanding how personal data is gathered and used online	.71		.44	.41
Understanding why different actors present facts differently	.71	.30		.43
Surfing safely on the internet	.69		.41	.32
Understanding the influence of media on society	.65	.33		.46
Reflecting critically on communication experiences	.63	.41		.43
Using online content in observation to copyrights	.60		.40	.43
Understanding the role of media for the job market	.55		.39	.51
Providing sources of information correctly	.55	.39		.63
Filtering and interpreting information from different sources		.82		.28
Using media to cooperate and achieve common goals		.73		.33
Searching for information effectively		.73		.35
Judging the credibility of information sources	.36	.69		.38
Prioritizing attention when multitasking with media	.40	.64		.36
Presenting work results in a digital presentation		.62	.42	.42
Choosing adequate media for specific purposes	.43	.60		.44
Implementing format principles for print media		.55	.53	.40
Choosing proper media to communicate with different partners	.41	.52	.37	.43
Following the norms for online communication	.33	.44	.41	.53
Making calculations with a spreadsheet program			.84	.28
Using technical terms correctly			.77	.30
Presenting data in graphics and in tables			.75	.37
Differentiating data formats, using them with the right programs		.38	.72	.28
Producing digital media outputs creatively		.37	.58	.51
Mean (SD) index practice fostering competence areas	3.32(.79)	3.39(.74)	2.60(.96)	
Cronbach's alpha practice scale	.94	.90	.87	
Mean (SD) index importance attributed to competence areas	4.29(.42)	4.12(.43)	3.54(.62)	
Cronbach's alpha importance scale	.85	.75	.78	

Note: Rotation method: Varimax; Kaiser-Meyer-Olkin factor adequacy = .94; Bartlett's $K^2 = 126.42$ (28), $p < .001$; explained variance = 61%.

flection of media aspects, while ICT/digital literacy involves competences in using technologies appropriately and effectively. Thus, the reflective private media use component is in line with the OECD media literacy concept, whereas the productive goal-oriented media use and the practical technology use components lie in the ICT/digital literacy do-

main. The components also match the competence areas proposed in the Flemish framework for primary education as cited in Tondeur et al. (2007b, p. 965): social and ethical competences, operating skills, and competences focusing on the learning process (see p. 55). These are respectively comparable with the competence components reflective private media use, practical technology media use, and productive goal-oriented media use. Moreover, the *Kursplan Medienkunde* points out that the areas related to communication, information, and presentation competence are especially relevant for learning with media, which agree with the competence items that load in the empirical component productive goal-oriented media use.

Deriving the empirical components, it is possible to test their associations with the predictors previously used. Therefore, scales are built by taking the average scores of the items grouped in each component, filtering out the items that load fairly equally in more than one component and the ones that have a high uniqueness, i.e., only a low amount of its variance can be accounted for by the set of components (marked in gray in Table 5.10). The means and reliability coefficients of the new scales are provided in Table 5.10.

To test the models, the predictors are based on the findings of the previous regression analyses. Importance attributed to the respective competence area, ICT use for instruction, perception on school's ICT resources, subject taught, and type of school (Gymnasium) are adopted because they presented fairly consistent results in different models. For the new models, subject taught is adopted as a binary variable for teaching STEM. Also, scales of importance attributed to the three competence areas are derived by taking the averages of the items equivalent to the teachers' practice scales (see Table 5.10 for means and reliability coefficients of the new scales). Moreover, having received formal training and having engaged in collaboration with colleagues regarding media education are also included since they show significant associations in some of the models previously tested. Here, they are adopted as binary scales (training/collaboration yes or no). Finally, the new models control for effects of age and gender.

The predictors are inserted hierarchically in the equation. First, a model is calculated with the strongest and most consistent predictors tested in the previous models — ICT use and importance attributed to the competence. In the second step, training, collaboration, a school's ICT resources, subject taught, and school type enter the model to determine whether any of them can predict the fostering of the three dimensions of media competence beyond the first two robust predictors. In the final step, the effects are controlled for age and gender.

The results (Table 5.11) show that, as in the previous regression analyses, a more intense teacher engagement in promoting students' media and digital competence is strongly related to convictions of the relevance of the respective competence area for students.

Table 5.11: Linear regression results of the further models tested with three empirical dimensions of teachers' fostering of students' media and digital competence

Predictor	Reflective private media use			Productive goal-oriented use			Practical technology use		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Importance competence	.42***	.41***	.39***	.29***	.30***	.30***	.19***	.22***	.17***
ICT use	.41***	.46***	.50***	.54***	.57***	.57***	.59***	.54***	.57***
Training		.02ns	—		.10*	.12*		.07ns	—
Collaboration		.11*	.07ns		.08ns	—		-.04ns	—
Schools' ICT resources		.00ns	—		-.10*	-.10*		.00ns	—
Subject taught (STEM)		-.18***	-.19***		-.17***	-.15**		.18***	.19***
School type (Gymnasium)		-.18***	-.14**		-.12**	-.13**		-.09ns	—
Age			.15**			-.02ns			.03ns
Gender (Male)			-.09ns			-.05ns			.02ns
R ²	.36	.45	.49	.42	.49	.49	.42	.48	.47
N	309	274	242	310	275	240	294	268	247

Note: * p < .05, ** p < .01, *** p < .001, ns not significant, — dropped from model. Standardized coefficients are displayed (beta).

In addition, the latest models reinforce that the teaching about different aspects of media frequently happens in combination with the use of technologies. Thus, as an overview of the different regression models, positive attitudes towards media education and ICT use for instruction are two steady factors associated with teachers' practice of fostering students' media-related competence. Beyond these steady predictors, subject taught is the only factor associated significantly with the fostering of the three areas.

Fostering competences in reflective private media use is associated significantly with collaboration, subject taught, school type, and age. However, when controlling for age and gender, the positive effect of collaboration is reduced and becomes not significant. The fostering of reflective private media use competence seems to happen to a lesser extent in the realm of STEM subjects and Gymnasium schools and to receive more attention from older teachers. Similar results are shown in the models that predict safety competence and mediation of risks in media use, indicating that the protective approach to media education tends to be more evident among older teachers.

The fostering of productive goal-oriented competences shows significant associations with training, teachers' perceptions on the schools' ICT resources, subject taught, and Gymnasium schools. While teachers who received formal training on media education tend to invest greater effort into promoting their students' competences in working purposefully with media, the fostering of competence in this area is associated with lower satisfaction with the ICT available in their schools.

From all the models tested, fostering of productive goal-oriented competence is the only one that shows a significant association with teachers' perception on the available ICT at their schools. It is likely that teachers who invest effort into developing students' competences in this area focus on the integration of ICT in pedagogical activities to improve teaching and learning. Therefore, their demands and wishes for good equipment might be more intense. Like in the reflective private use competence area, the fostering of productive goal-oriented competence happens less intensively in STEM subjects and in Gymnasium schools. Age and gender do not alter these associations and do not contribute further to explain the variance in teachers' efforts in promoting their students' competence.

Regarding promoting practical technology competence, teaching STEM subjects is the only significant predictor in addition to ICT use and perceived importance of the competence area. Different from the other two competence areas, the association with teaching STEM is positive. The results are consistent with the second model version, which shows that fostering competences in practical use of digital tools finds more room in the realm of STEM subjects. The significant effect remains steady when controlling for age and gender.

In summary, considering all models tested to predict teaching about different areas of media competence, the positive and strong associations with ICT use and perceived importance of the competence area are a constant. Despite the strong and consistent association of ICT use for instruction with fostering media competence, how teachers evaluate the ICT available at their school does not usually play a role. Only fostering of competences in productive goal-oriented media use is associated with some level of dissatisfaction about school ICT resources. Moreover, it became clear that media education has less room in Gymnasium schools than in other school types and most competence areas tend to be fostered in the realm of non-STEM subjects. Competences in operating digital tools and dealing with computers are an exception since they are positively associated with teaching STEM subjects.

When it comes to training, it positively associates with fostering competences that are relevant for the purposeful work with media, such as information competence. Consequently, it may imply that teachers are likely to receive more training regarding using ICT for instruction than about teaching the array of topics and dimensions involved in media literacy. Therefore, they might prioritize the development of necessary competences for the work with media to be effective. However, learning about media education aspects through collaboration with colleagues seems to be a relevant factor to complement teachers' preparation for mediating risks and opportunities of students' media use, as in communication and safety aspects. As already mentioned, the effects of age seem to indicate an inclination to the protective approach to media education among older teachers. Gender, however, does not seem to influence teachers' practice in promoting media and digital literacy.

5.4 Study 3: Associations between teaching with and teaching about media

The third study (see publication "ICT use for teaching media literacy", reference on p. 64) deals with the research question: To what extent is the use of specific information and communication technologies associated with the fostering of specific media-related competences? This study aims to look in more detail at the effect of ICT use on teaching about media, by considering the use of different types of ICT and the fostering of different competence areas. Therefore, the data collected from teachers in Thuringia were analyzed. Information on the data collection and sample have been provided in the section 5.3 (p. 76 and p. 79). To account for the different dimensions of ICT use and fostering of competence and the associations with each other, exploratory structural equation modeling was adopted for the analysis.

5.4.1 Analysis

Structural equation modeling (SEM) is a collection of analysis techniques, including measurement and structural approaches (Kline, 2011). Thus, in one test, it is possible to reduce the dimensions of a set of measures with factor analysis, build the corresponding constructs, and test associations between constructs. Moreover, not only multiple predictors, but also several outcome variables can be considered in a model. Consequently, SEM can handle complex models. However, it demands data from large samples for the analysis to work more reliably, especially when the factor analysis part is included. The sample size in the dissertation study is 315 cases, which is above the threshold of 200 cases identified by Kline (2011). However, the study is intended to test a fairly complex model of the associations between the use of different ICT types and the fostering of various competence areas. For this reason, it was necessary to develop a parsimonious model, i.e., to reduce the number of variables involved.

Therefore, different from the previous study, the outcome variables referring to fostering students' media competence were not modeled into six, but into four competence areas that appear in most media and digital literacy frameworks (Buckingham, 2006). As the modeling of these variables was based on theory, confirmatory factor analysis (CFA) was used. Yet, the dimensions of ICT use were generated in an exploratory way through exploratory factor analysis (EFA). Both the resulting competence and ICT use factors are latent variables in the model. That is, they are not directly measured in the data, but are constructed with variables that are observed in the data set according to the respective loadings of the confirmatory and exploratory factor analyses. As the model includes the exploratory element, the analysis conducted consists of an exploratory structure equation model (ESEM). The ESEM was performed with MPlus version 8.4, adopting full information maximum likelihood to handle missing cases and robust maximum likelihood as the estimation method.

The analysis of the model shown in Figure 5.5 has been performed in three steps. Firstly, the EFA and the CFA are conducted. Then, the associations between the ICT use types (latent variables resulting from the EFA) and the fostering of media competence in four areas (latent variables resulting from the CFA) are tested. Finally, the model controls for the effect of predictors that are considered in the model of study 2, namely: having received formal training in media education (binary scale), having engaged in collaboration with colleagues related to media education (binary scale), teaching STEM subjects, and school type.

Additionally, perception of school ICT resources was inserted as predictor, because the ESEM model also tests correlations of predictors with the different types of ICT use. Thus, even though perception of school ICT resources has not yielded significant associ-

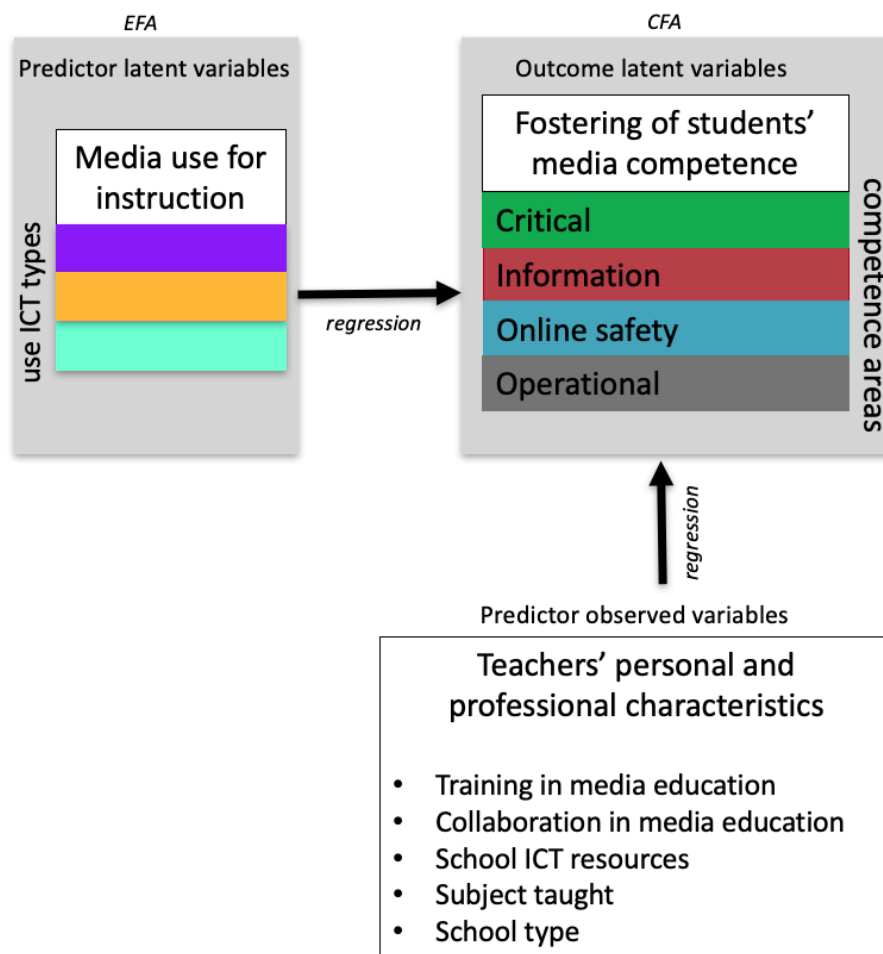


Figure 5.5: Research model of the third study (author's illustration)

ations in the first models that predicted fostering of media competence, it was included to test its correlation with ICT use. Although importance attributed to the competence areas was one of the strongest predictors in the regression models, it was not part of the ESEM. As the importance measures are built with the competence indicators that correspond to the fostering measures, it would demand a CFA also with importance indicators of the four competence areas. Thus, the model would get several additional parameters, which could probably not afford an analysis with the number of cases available in the data set used. The predictors inserted in the model are observed variables, i.e., the measures have direct scores in the data set.

To evaluate to what extent the hypothesized model fits the observed data, the following goodness-of-fit indicators and respective suggested reference values are considered: ratio between chi-squared and degrees of freedom ≤ 2 (Schermelleh-Engel et al., 2003), Tucker-Lewis Index (TLI) $\geq .90$ for model acceptance (Hox & Bechger, 1998), mean square error of approximation (RMSEA) $\leq .05$ with 90% confidence interval, compara-

tive fit index (CFI) $\geq .95$, standardized root mean square residual (SRMR) $\leq .08$ (Kline, 2011; Schreiber et al., 2006).

5.4.2 Findings

The relationship between ICT use for instruction and fostering students' media competence is the focus of the third study. This study differs from the analyses conducted in study 2 in considering not only the use of ICT in general. Instead, it looks for patterns in teachers' ICT use and verifies how the use of these different types of ICT relate to the fostering of different media literacy aspects.

First, the dimensions of ICT use are identified. Loadings and fit indices of the EFA and the CFA are reported in the study publication (see publication "ICT use for teaching media literacy", reference on p. 64). In the EFA conducted within the ESEM, it is possible to identify three types of ICT use. The first consists mainly of the use of computer labs, learning platforms, and basic computer tools such as websites, spreadsheets, and text editors, and therefore, it is labelled as "desktop-basics". The second corresponds primarily to the use of interactive boards, data projectors, presentation programs, and online videos, receiving the label "presentation-visualization". Finally, the last dimension has stronger loadings for the use of mobile devices, websites, communication tools, search engines, and online videos. Thus, it is referred to as "mobile-online". According to the results of the EFA, the three dimensions of ICT use are built as latent variables in the ESEM. Fostering information, safety, operating, and critical competences are based on a theoretical construct. Thus, they are latent variables derived from the CFA.

The following step verifies the associations of the three types of ICT use with the teaching about four areas of media competence (see columns indicating "Model 1" in Table 5.12). The results show that desktop-basics use predicts positively and strongly all four competence areas. The use of mobile-online ICT yields significant association with the fostering of two competence areas, predicting positively teachers' efforts to develop students' critical competence and information competence. Conversely, ICT use of the type presentation-visualization does not seem to be involved in activities to promote media literacy. It associates significantly only with fostering safety competence, and this relationship is negative.

Finally, predictors already used in the previous models are entered (see columns indicating "Model 2" in Table 5.12). When controlling for the effects of training, collaboration, satisfaction with school's ICT, teaching STEM, and teaching at a Gymnasium, the associations with types of ICT use remain mostly stable. The exception is the association of mobile-online ICT use with fostering critical competence, which weakens and turns out not to be significant.

Table 5.12: ESEM results: Associations between different types of ICT use and fostering of different competence areas

Path coefficients	Critical competence		Safety competence		Operational competence		Information competence	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
			2		2		1	
Desktop-basics	.34***	.50***	.72***	.83***	.82***	.92***	.50***	.64***
Presentation-visualization	-.05ns	-.11ns	-.24**	-.27**	-.13ns	-.20ns	-.03ns	-.10ns
Mobile-online	.24**	.14ns	.06ns	-.02ns	.06ns	.03ns	.26***	.18*
Training		-.01ns		-.02ns		-.01		.15**
Collaboration		.11ns		.13*		.04ns		.09ns
School's ICT		.01ns		-.01ns		-.04ns		-.11*
Subject taught (STEM)		-.30***		-.18**		-.01ns		-.28***
School type (Gymnasium)		.06ns		-.01ns		.08ns		.07ns
R ²	.19	.28	.37	.42	.57	.58	.36	.49
Correlations	Desktop-basics		Presentation-visualization		Mobile-online			
Training		.28***		.19**		.10		
Collaboration		.01ns		-.04ns		.09ns		
School's ICT		.19**		.15*		.07ns		
Subject taught (STEM)		.28***		.13ns		-.20*		
School type (Gymnasium)		-.19**		.16*		-.15*		

Note: * p < .05, ** p < .01, *** p < .001, ns not significant. Standardized coefficients are displayed.

Comparing with the findings of the final regression analyses presented in the second study (Table 5.11, p. 91), the effects of training, collaboration, and satisfaction with schools' ICT are consistent. The associations of training and satisfaction with schools' ICT with fostering information competence found in the ESEM match the effects of these predictors observed in the regression analysis of fostering competence in productive goal-oriented media use. Likewise, the positive and significant association between collaboration and fostering safety competence observed in the ESEM is compatible with the effect of collaboration on fostering competence in reflective private media use in the regression analysis.

Furthermore, the negative and significant associations of teaching STEM with promoting critical, safety, and information competence are consistent with the regression findings for fostering competences in reflective private and productive goal-oriented media use. However, the positive association of teaching STEM with promoting students' operational skills that was found in the regression analysis does not hold in the ESEM. The main discrepancy between the ESEM and the regression findings lies on the effects of teaching at a Gymnasium. In the ESEM, teaching at a Gymnasium does not yield significant associations with the teaching of any competence area. Thus, its negative and significant associations with promoting reflective private and productive goal-oriented media observed in the regression analyses are not sustained in the ESEM.

However, when considering the correlations between the predictors and use of ICT types, it is observed that teaching at a Gymnasium correlates negatively with the use of desktop-basics ICT, and positively with the use of presentation-visualization technologies. Therefore, it is possible that ICT use has a mediator effect between type of school and teaching about different areas of media literacy. This might be the case also in the association between teaching STEM and promoting students' operational skills. Since teaching STEM is positively and significantly correlated with desktop-basics use, it is possible that teaching STEM subjects predicts primarily ICT use, and thus, has an indirect effect on fostering operational competence.

In summary, when ICT use is considered more in detail and takes into account what types of ICT are used, differences can be observed in the associations with teaching different areas of media literacy. It is clear that most of the teaching about media happens in computer labs and that the use of presentation technologies does not play a role in media education. Also, on the one hand, the ESEM confirms the effects of training, collaboration, and satisfaction with schools' ICT observed in the regression analyses of the second study. This corroborates the analysis by Lorenz et al. (2019) (see p. 62), who conclude that the effects of collaborating with other teachers on ICT-related issues and dissatisfaction with schools' ICT can be directly associated with fostering students' digi-

tal competence, without necessarily passing through ICT use.

On the other hand, the ESEM findings raise questions concerning the direct effects of teaching STEM and teaching at Gymnasium schools on the fostering of students' media-related competences. It is possible that these associations observed in the regression analyses are indirect effects of the predictors on ICT use. Thus, while ICT use might not be a crucial mediator in relation to some predictors of teaching about media, as collaboration and satisfaction with schools' equipment (Lorenz et al., 2019), it may play a relevant mediator role regarding differences between types of school and subject taught. Future studies can test the hypothesis that school type and subject taught predict type of ICT use, which, in turn, associates with fostering students' operational competence.

As for limitations, SEM is an analysis method that demands a large number of observations in the data. The higher the complexity of the model, i.e., the number of variables involved and the calculated relationships between them, more observations are demanded. It was attempted to reduce the model parameters by inserting a limited number of observed variables both as indicators of the latent variables and as predictors in the model. Ideally, a considerable larger number of observations would be necessary for testing more complete models, which could also test hypotheses concerning the mediator role of different types of ICT use.

Moreover, some of the fit indexes are not optimal, which indicate that the model is not an excellent fit to the data. Nevertheless, the associations with some of the predictors agree with the findings of the regression analysis, which back the robustness of the model. Thus, the ESEM analysis serves well the purpose of looking specifically at the relationships between different types of media use and teaching of different competence areas.

Chapter 6

Discussion

Four decades ago, the Grünwald Declaration on Media Education called for systematic investments and efforts to establish media and communication as elementary objects in formal schooling. Over time, the intersections of the fields media and education have attracted increased attention from policy, research and scholarship. Several policies and initiatives have advocated the promotion of media and digital literacy among citizens of all walks of life, for which the establishment of media education at school is considered a solid basis.

The *Kursplan Medienkunde* as a media literacy framework for secondary schools in the state of Thuringia is an example of systematic efforts from the policy level to promote media education. In accordance to international, European, and German framework proposals, the Thuringian plan consists of media and digital competences in several areas. The topics related to media should be approached in the realm of traditional school subjects. Therefore, schools should develop their detailed teaching plans. However, media competence is not a regular part of school exams.

Teachers are responsible for implementing the media teaching plans, i.e., the development of media-related competences at school are likely to happen through teachers' interventions. The analysis of ICILS data indicates that in most cases, teachers are not recognized as the primary mentor of students in several aspects of digital competence. However, the findings of the first study point out that children and young people who have scarce stimuli and conditions to explore technologies outside the school may especially look up to teachers to learn to operate specific computer tools and perform certain tasks in digital environments.

As over 90% of adolescents in Germany possess a smartphone and almost all have access to the internet at home (Feierabend et al., 2020), familiarization with digital media and sustained use are likely to lead to the autonomous development of certain skills. Nevertheless, since children and youth access the internet primarily from mobile phones,

relying on mobile data might constrain the experiences they have online (Livingstone et al., 2019). School can certainly offer students the opportunity to master further types of devices, systems, and tools for different purposes, which are not a regular part of their private media use. Thus, being the primary mentor for students to develop media and digital competence is not the teachers' goal in the media education practice, but it is worth verifying which aspects of media and digital literacy teachers can provide meaningful contributions.

Within the limited competences pool measured in the ICILS 2013, it is clear the importance of teachers in developing students' skills to use media for school work. Students' indications of teachers as the main reference to learn how to create documents for school work suggest that previous familiarity with digital media does not automatically enable students to use tools and perform activities in digital environments for learning purposes. Consequently, measures such as providing one media device per student and the use of learning management platforms, as planned in Thuringian school digitalization initiatives, should necessarily be accompanied by the teaching of the adopted medium and the training to perform actions on it.

Even when access to technologies and interventions from family and peers out of school promote the development of certain media and digital skills, the school is the most likely place in which the comprehensiveness of media literacy can be approached and addressed systematically. That is, media education at school is an opportunity for children and youth to develop the complete spectrum of media-related competences, independently of the access to technologies and stimuli they have out of school. The dimensions that compose the broad spectrum of media and digital literacy can be approached in different ways. For instance, it can be oriented by the potentialities of media use, such as in opportunities and risks, the applied domains, like in school work and private use, or the topics of interest, as information, safety and impact on society. Hence, competence areas can be approached in various ways.

The empirical dimensions identified in Thuringian teachers' practice is a possible way to group media-related competences. The three resulting competence areas were labelled as reflective private media use, productive goal-oriented media use, and practical technology use. Considering the elements of the literacy construct — textuality, competence, and power (see 2.3, "Media literacy", p. 15), the three dimensions can be distinguished well in terms of power. The expected power generated by fostering productive goal-oriented competences can be the enhancement of learning processes by the effective media use at school in relation to pedagogical goals. As several policies highlight the benefits for the job market as the main point of relevance in promoting digital competence, the power of practical technology use competence might be seen as paving a way for further technology

qualification and technology use in professional fields. Finally, the power of developing reflective private use competence is the resourcefulness to deal with mediated phenomena that affect students directly and shape their society.

More important than following strict descriptions in media literacy frameworks is that schools have flexibility to approach the different competences in a way that feels more helpful for distributing among teachers the responsibility of covering the areas in their teaching. Some competences might fit, and be useful in practically all subjects since they benefit productive school work with media. However, others may need to be intentionally placed in the teaching plan of specific subjects.

Although schools can establish which subjects of which grades should integrate the competences to be taught to students, it is mostly up to individual teachers to decide to what extent the development of students' media-related competences is a goal in their practice. As the analyses of Thuringian teachers' data point out, being convinced of the relevance of a certain competence area is a fundamental condition for teachers to invest effort into working on the respective competences with their students.

Probably, most teachers would not deny the pertinence of the majority of media and digital competences. However, deciding to foster them in their classes should have to do with teachers' priorities in the syllabi of the subjects they teach, the curricula they need to follow, the examinations for which they need to prepare students, and the conditions they consider favourable to conduct their work. Consequently, competences that are useful for the effective work with digital media at school are more likely to be fostered, such as information and presentation competences. Therefore, positive attitudes to teaching about media may be stimulated by showing teachers which competences are beneficial for determined teaching and learning purposes. This can happen, for instance, through successful examples shared by colleagues or in professional development courses and workshops.

The results of the analyses show a consistent association of the use of ICT for instruction with teaching about different aspects of media and digital literacy. However, the findings point to variations when different ICT types are considered. There is a strong preference among teachers for approaching media competence development by letting students use media in their classes, while the use of visualization and presentation technologies seem to play no role in the process. It is pertinent that when developing media education teaching plans, schools consider the different media available for the work with students, their components and functionalities, and inspect both what competences are necessary for the productive work with the tool and what competences can be fomented through the use of the tool.

As for the time of the data collection in 2017, a substantial part of the media education

work in secondary schools in Thuringia was happening in computer labs. It is expected that the recent initiatives to equip schools with stable and comprehensive internet access, and teachers and students with portable devices impact the scenario of media education in schools. The relevance of developing competences for the effective work with media and digital resources is likely to become more self-evident and become part of the routine of all subjects in which they are used.

Thus, the expectation that the strengthening of schools' digital infrastructure promotes students' digital competences, as declared in the Digital Education Action Plan of the European Union (European Commission, 2018, 2020) and the *DigitalPakt Schule* in Germany, is likely to concern a limited area of competences, especially the ones that are instrumental for the teaching and learning with digital tools. This hypothesis should be tested in future studies that evaluate the impacts of such initiatives.

In addition, practical technology competences, which concern the functionality of computer systems and the performance of computer-assisted tasks, are likely to profit from investment in schools' digital infrastructure since they are frequently recognized as relevant for the job market. The findings of the analyses of Thuringian teachers show that practical competences tend to be addressed in the realm of STEM subjects. Strengthening these school subjects is a constant concern of educational policies and is frequently one of the goals of school digitalization initiatives, which foresee the availability of advanced tools, such as simulation, modelling, measuring and robotic tools in STEM subjects.

Moreover, there are recommendations ("Dagstuhl-Erklärung: Bildung in der digitalen vernetzten Welt", 2016; Kultusministerkonferenz, 2021; "Medienpädagogisches Manifest – Addendum 2019", 2019) and initiatives (experimental new subject Informatics/Media Education in Thuringia) to intensify the teaching in computer sciences. It is advantageous for the fostering of technology-related competences, i.e., the focus of computer and information literacy, ICT literacy, and digital literacy, that informatics is already offered as a separate subject in the upper secondary years in several schools. Thus, an already existing work can be expanded to other classes. In addition, informatics is an official domain of teacher training. Consequently, there are professionals trained to teach the competence area.

Hence, the development of educational policies in the direction of digitalization may benefit the fostering of competences for productive goal-oriented media use and the practical technology use. Yet, it is pertinent to ensure that competences that go beyond the work with devices are not ignored. competences in the reflection and critical analysis of communication phenomena, media mechanisms, behaviors and its implications remain relevant in the face of the noticeable involvement of media processes in prominent societal issues. The amount of disinformation and governmental propaganda that surrounds

the recent health, geopolitical, climate, and economic crises serves as an example.

While the fostering of competences for productive goal-oriented use may follow ICT use for teaching and learning in the majority of subjects, and practical technology use might be stimulated in STEM subjects, and in a stand-alone informatics subject, the intentional integration in the teaching plans of competences in critical analysis of communication phenomena might be necessary. Therefore, it is appropriate to conduct new studies that investigate the impact of schools' digitalization investments on the promotion of media education. In this regard, it would be especially pertinent to examine the emphasis given to teaching the different dimensions of media literacy in classes that adopt the "one device per student" approach.

For teachers to promote students' analytical and safety competences, related especially to private media use, the perspective of mediation may be particularly meaningful. Communication phenomena can be incorporated as topics in classes by calling upon students' media experiences. Thus, instead of instructing on the "correct" media use, with strategies such as active mediation and co-use, together with students, teachers can question and search for information on how media mechanisms work, analyze different aspects of media-related situations, and discuss potential problems in determined media behaviors and possible solutions.

Considering that the scope of media literacy expands regularly (Arcus, 2014; Ranieri, 2019), approaching the fostering of media competence collaboratively with students can help alleviate the burden that teachers need to be experts in every aspect of communication phenomena. It can be a chance for educators to better understand the media environments in which young people transit, learn with them about tools, contents and actors, draw their attention to issues they might not see, and discuss with them implications of situations and behaviors.

Besides the potential contributions of the mediation practice to promote competences in reflective private media use, with the intensification of one device per student initiatives, mediation is likely to happen more commonly in relation to students' media use during classes. In this sense, active mediation and co-use might also be useful strategies for the development of productive goal-oriented and operational competences. Therefore, mediation can address students' media use in and out of school. Consequently, it can be a complementing practice in media education, accompanying the media use for instruction and facilitating the fostering of students' media-related competences.

Overall, discussions about media education in the academic, political, and educational spheres should account for particular aspects: firstly, teachers' practices involving media, in which media have different roles (see p. 11); secondly, the several dimensions of media literacy competences since the fostering of certain competences can be emphasized over

others (see study 2, section 5.3); and thirdly, the variety of ICTs susceptible to being used in classes, their characteristics as a medium and their potential to aid the fostering of specific digital and media competences (see study 3, section 5.4).

For example, policies and recommendations about digitalization in teaching, such as the DigCompEdu (Redecker, 2017), could address more precisely the intersections between media and education in the teaching practice — teaching with media, teaching about media, and mediating students' media use. Consequently, it should impact teacher training policies. Policies and recommendations frequently mention teacher training as a necessary measure to promote media education. However, the findings of the analysis of Thuringian teachers' data indicate that formal training associates with the fostering of only a few competence aspects. Based on this, it is pertinent to verify whether existing training offerings to teachers focus on a more limited pool of topics than the competence frameworks prescribe.

If teachers are responsible for implementing comprehensive media and digital competence plans, they should be able to get training to teach the various competence areas, understand to what extent different media can, at the same time, demand and potentially facilitate students' competences, and get to know the mediation of students' media use as a possible approach to promote media literacy. To consolidate media education in schools, policies should structure teacher training programs based on competence modules and provide the respective professional certification. Such measures could contribute to a more systematic and broader coverage of media competence areas in teaching. Measures like these could also address a deficit pointed out in the EMEDUS (Hartai, 2014), by certifying professionals to teach topics of media studies and thus, help establish the fostering of critical reflective media use in teaching plans.

Previous research shows that media education policies tend to allocate funds to equipment rather than human resources (Frau-Meigs et al., 2017). Recent initiatives in Germany and Thuringia fit this pattern, as both the *DigitalPakt Schule* and the project *Digitale Pilotschulen* focus on the allocation of funds to improve schools' digital infrastructure. Interestingly, most analyses of Thuringian teachers' data show no associations between teachers' efforts dedicated to promoting students' media literacy and how satisfied they are with the technology available at their school. Similar results are reported for the majority of participating countries in the two ICILS editions. In this regard, the explanation put forward by Fraillon et al. (2014) may also hold true for teachers in Thuringia: “the development of ICT in schools has progressed to a point where resources can no longer be seen as an explanation for teachers failing to develop their students' computer and information literacy” (p. 219).

According to the findings of the dissertation, only when the fostering of productive

goal-oriented competences is taken into account, it is identified that teachers who put greater effort in this direction tend to be dissatisfied with their school's ICT resources. Such an association can be regarded to teachers' ambitions in relation to the work with ICT and their perceptions that more advanced ICT use for teaching and learning could be possible if further or better resources were available. In this sense, teachers' ambitions regarding the work with ICTs may have to do primarily with their attitudes towards technologies and their preparation concerning the use of digital resources to achieve pedagogical goals.

Thus, the current digital infrastructure initiatives should be complemented by policies that allocate funds for investments in human resources, so that media education can benefit from the process of school digitalization. For example, such investments could guarantee that when a school acquires new technologies, its teachers receive the training to use the equipment, and develop or adapt didactic concepts and pedagogical goals with the ICT. Also, principals should receive training to develop strategic plans for the digital infrastructure of their schools.

In addition to training in teaching with media, pre-service and in-service certification programs in teaching about media and digital literacy areas should be established, as previously commented. Moreover, teacher training could go beyond the content supposed to be taught in media education and the preparation to promote certain media-related competences. Media education training could stimulate teachers to realize and embrace the roles they can have as media educators, such as "enablers" in encouraging students to explore digital resources (Livingstone et al., 2017), "windows" in expanding students' perspective about the possibilities and risks of media use, or "guides" in helping children make sense of the media world (Kalmus, 2013).

Furthermore, the findings point to differences between school types. In comparison with teachers at other school types, Gymnasium teachers tend to give less emphasis to the overall fostering of media-related competences, in line with findings reported for teachers in Germany in the *Länderindikator* study (Lorenz et al., 2017). Further research should be conducted to better understand the nature of such differences. On one hand, it is pertinent to verify, for instance, to what extent teachers' efforts in media education are driven by the perception that they are not central media mentors for students. Since Gymnasium students tend to have, on average, higher socioeconomic conditions than students in other secondary school types, teachers might assume they have enough opportunities to learn about media and develop digital skills out of schools. On the other hand, it can be examined whether the main differences between schools lies primarily on the type of ICT use, which in turn, reflects on differences in the emphasis given to promote media literacy.

In this regard, similarly to the first study, which examines students' perspective of the

contributions of teachers for their development of computer and information literacy, the teacher's perspectives on the topic could also be investigated. A survey with secondary teachers of different school types could include measures similar to the ICILS, asking teachers who they believe are students' primary reference in learning about a series of media-related competences in several areas. Also, teachers' perceptions on students' socioeconomic conditions and stimuli received in the family as well as reports on their engagement in media education practices could be measured. Thus, associations between the constructs could be tested, controlling for differences between school types.

In addition, it can be considered to what extent the Gymnasium orientation in preparing students for the *Abitur* plays a role in setting lower priority to media education. This point would meet the latest recommendation of the Kultusministerkonferenz (2021), which urges that mechanisms be established for monitoring students' competence development and evaluation practices be adapted to accommodate the learning with and about media. Integrating indicators for competence monitoring might be constructive to establishing media-related competence development as a mandatory goal.

Besides the differences between school types, the variations in media education practices in the different grades could be a point to consider in future studies. The *Länderindikator 2017* points out differences concerning the media-related content taught in the grades 7/8 and 9/10. However, the survey with Thuringian teachers does not measure the variations in different grades. Therefore, this factor has not been included in the analyses presented in this work. Both *Medienkunde* frameworks for primary and secondary schools in Thuringia indicate the competence aspects that should be taught to students in each grade. Thus, future studies could investigate how media education happens in the transition between primary and secondary school. For instance, data collected through a survey could allow a comparison between teachers' emphasis on media literacy fostering in the last year of primary school and the first year of secondary school.

Moreover, the findings of the studies conducted in Thuringia show that collaboration among teachers can be beneficial for media education practices. Future studies could have a closer look at teachers' collaboration processes in relation to media. For instance, studies can take into account the differences between collaborating with colleagues of the same school and engaging in online collaboration with teachers from other schools, for instance, through social networks. Exchanging ideas and experiences and networking with colleagues online is one of the digital competences for educators prescribed in the DigCompEdu (see p. 32). Thus, it would be pertinent to investigate teachers' perceptions on this specific type of activity and the links with their practices in media education.

Undoubtedly, there is plenty of room for further research on teachers' practices of media education. As a general recommendation, future studies should consider the in-

terplay between the different practices involving media — teaching with ICT, teaching about media and digitalization, and mediation of students' media use. In approaching each practice individually, the array of their dimensions should be taken into account, i.e., different educational technologies, various media and digital competences, and different mediation strategies.

The practice of mediation of students' media use particularly needs further research to address questions that remain open, such as what mediation strategies teachers adopt to foster determined competence areas, and to what extent teachers' mediation happens in relation to students' media use in and out of school. Thus, the views on the interplay between teachers' practices involving digital media could become more specific, sharpening the model of teaching practices in media education.

While the studies presented in the dissertation enabled the discussion about several aspects of media education in schools, it should be acknowledged that the analyses were made with cross-sectional data. In the case of Thuringia, the data refer to media education activities in 2017. In face of the latest digitalization plans and initiatives in Thuringia, it is sensible to investigate their impacts on media education practices in schools. Fortunately, the author currently takes part in a project to evaluate the initiative *Digitale Pilotenschulen*. In the realm of this evaluation project, it will be possible, for instance, to conduct observations in the digital pilot schools to verify the contexts and purposes of technology use in class. Furthermore, new teachers' data can be collected regarding their efforts and priorities in fostering students' competence in different areas, and their use of a broader array of digital resources. Moreover, the links between fostering of different competence areas and use of various ICT types could be investigated in schools that test the new subject *Informatik/Medienbildung*.

Media environments and communication phenomena are dynamic. Constantly, new aspects of technology and media use become relevant in different sectors of society. Since “The Grünwald Declaration on Media Education” (1983), there has been progress in the efforts to promote media education in schools. However, the practice of media education still needs solidification. The work presented here aimed at offering a contribution to the discussion in this direction. Hopefully, the efforts of media education practice, policy, and research will be able to keep up with the pace of the developments in media, communication, and technology. And may the intended power of media literate citizens and societies prevail soon.

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Teachers' Questionnaire (Thuringia Project)

Dear teacher,

This study aims to investigate the roles that the fostering of media literacy play in the school work and your opinions on its relevance.

The survey serves research purposes in the realm of a doctoral dissertation. In addition, the findings should assist the Ministry of Education, Youth and Sports in Thuringia to improve teaching and learning plans and teacher professional development offers.

To obtain representative results, a total of 88 schools with over 2,500 teachers were randomly selected to participate in the survey. All teachers in the selected schools are asked to take part in the survey. For the research success of the project, it is very important that also you share your opinions with us.

It takes approximately 15–20 minutes to answer the questionnaire. Most questions are multiple choice, but there is space at the end of the questionnaire for you to comment about any aspects that might have not appeared in the questions. Your participation is voluntary and completely anonymous. All information will be processed confidentially. The results will be published only in form of summary statistics. If you have questions about the study, feel free to contact us anytime.

Thank you very much for your contribution.

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Information about the employment situation

Please indicate the school type, in which you mainly teach:

- Regelschule
- Gymnasium
- Thüringer Gemeinschaftsschule
- Gesamtschule
- Förderschule

Do you work full time or part time?

If part time, what is the percentage of your contract? _____%

Which grades have you been teaching in the last years? (multiple answers possible)

- 5. 6. 7. 8. 9. 10. 11. 12./13.

How large are in average the classes that you usually teach?

approx. _____ students

Please indicate the main subjects that you have been teaching in the last years:
(multiple answers possible)

- | | | |
|--|---|---|
| <input type="checkbox"/> Astronomy | <input type="checkbox"/> History | <input type="checkbox"/> Religion |
| <input type="checkbox"/> Biology | <input type="checkbox"/> Informatics | <input type="checkbox"/> Social sciences |
| <input type="checkbox"/> Chemistry | <input type="checkbox"/> Arts | |
| <input type="checkbox"/> German | <input type="checkbox"/> Mathematics | <input type="checkbox"/> Sports |
| <input type="checkbox"/> Ethics | <input type="checkbox"/> Humans-Nature-Technology | <input type="checkbox"/> Practical work |
| <input type="checkbox"/> Foreign languages | <input type="checkbox"/> Music | <input type="checkbox"/> Economy and Law |
| <input type="checkbox"/> Geography | <input type="checkbox"/> Physics | <input type="checkbox"/> Economy-Environment-Europe |
- Seminar class

Media and teacher's role

Please indicate to what extent you perceive the following tasks as part of the teacher's job.

	It is within the teacher's tasks and I do it	It is within the teacher's tasks but I don't do it	It is actually not the teachers' job, but I do it anyway	It is not the teachers' job, thus, I don't do it
Fostering students' media literacy	()	()	()	()
Communicating online with students out of the school time (e.g., Facebook, WhatsApp, E-Mail)	()	()	()	()
Communicating online with students' parents (e.g., Facebook, WhatsApp, E-Mail)	()	()	()	()
Developing and implementing rules for students' media use of in class	()	()	()	()
Getting to know results of school relevant studies (PISA, ICILS)	()	()	()	()
Using media pedagogically in class	()	()	()	()
Teaching online	()	()	()	()
Checking students' work for plagiarism	()	()	()	()

Curricular integration of media education

Now we have some questions about the integration of media education in the curriculum of secondary schools in Thuringia.

	I know it (very) well	I have an idea about it	I've heard of it, but I don't know exactly what it says	I've never heard of it
There is a point in the „Thuringian Plan for Education until 18 years old“ dedicated to media education. How well do you know its content?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The <i>Kursplan Medienkunde</i> described how media education in Thuringia should be implemented. How well do you know the plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Based on the <i>Kursplan Medienkunde</i> , the schools in Thuringia should develop an internal teaching and learning plan. How well do you know the media education teaching and learning plan of your school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
According to the <i>Kursplan Medienkunde</i> , the students should get a <i>Medienpass</i> , which complements their school reports. How well do you know this <i>Medienpass</i> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate in which subjects you integrated aspects of the *Kursplan Medienkunde* in the last years. If the *Kursplan* does not play any role in your teaching activities, please indicate “in no subject”.

(Multiple answers possible)

<input type="checkbox"/> in no subject	<input type="checkbox"/> Seminar class	
<input type="checkbox"/> Astronomy	<input type="checkbox"/> History	<input type="checkbox"/> Religion
<input type="checkbox"/> Biology	<input type="checkbox"/> Informatics	<input type="checkbox"/> Social sciences
<input type="checkbox"/> Chemistry	<input type="checkbox"/> Arts	
<input type="checkbox"/> German	<input type="checkbox"/> Mathematics	<input type="checkbox"/> Sports
<input type="checkbox"/> Ethics	<input type="checkbox"/> Humans-Nature-Technology	<input type="checkbox"/> Practical work
<input type="checkbox"/> Foreign languages	<input type="checkbox"/> Music	<input type="checkbox"/> Economy and Law
<input type="checkbox"/> Geography	<input type="checkbox"/> Physics	<input type="checkbox"/> Economy-Environment-Europe

Importance of media literacy

Media literacy involves several topics and skills, which the students should have known and developed by the end of their school years. Some of these competencies are listed below. Please indicate how important you believe each of the aspects are.

	Especially important	Very important	Somehow important	Not so important	Not important
Reflecting critically on own positive and negative communication experiences.	()	()	()	()	()
Providing sources of information correctly.	()	()	()	()	()
Understanding the meaning of media for the job market.	()	()	()	()	()
Choosing adequate media for specific purposes.	()	()	()	()	()
Understanding the influence of media on society.	()	()	()	()	()
Evaluating the potential effect of violence in the media.	()	()	()	()	()
Understanding why different actors present facts in different ways.	()	()	()	()	()
Distinguishing between real and virtual identities.	()	()	()	()	()
Differentiating between advertising and journalistic content.	()	()	()	()	()
Evaluating the danger of media addiction.	()	()	()	()	()
Using online content in observation to copyrights.	()	()	()	()	()
Dealing properly with cyberbullying.	()	()	()	()	()
Surfing safely on the internet.	()	()	()	()	()
Protecting own data and private sphere effectively.	()	()	()	()	()
Understanding how personal data is gathered and used further while using online media.	()	()	()	()	()

Media literacy in practice

When you consider the last year, how often have you conducted the following activities / addressed the following aspects with your students?

	very often	often	sometimes	seldom	never
Reflecting critically on own positive and negative communication experiences.	()	()	()	()	()
Providing sources of information correctly.	()	()	()	()	()
Understanding the meaning of media for the job market.	()	()	()	()	()
Choosing adequate media for specific purposes.	()	()	()	()	()
Understanding the influence of media on society.	()	()	()	()	()
Talking about the potential effect of violence in the media.	()	()	()	()	()
Discussing about why different actors present facts in different ways.	()	()	()	()	()
Distinguishing between real and virtual identities.	()	()	()	()	()
Differentiating between advertising and journalistic content.	()	()	()	()	()
Evaluating the danger of media addiction.	()	()	()	()	()
Using online content in observation to copyrights.	()	()	()	()	()
Discussing about how to deal with cyberbullying.	()	()	()	()	()
Surfing safely on the internet.	()	()	()	()	()
Learning how to protect own data and private sphere effectively.	()	()	()	()	()
Recognizing how personal data is gathered and used further while using online media.	()	()	()	()	()

Perception of students' media literacy

**How well do the students master the following aspects when they finish school?
Please evaluate the students in general, i.e., independently from individual differences.**

	Very well	well	satisfactorily	sufficiently	insufficiently
Reflecting critically on own positive and negative communication experiences.	()	()	()	()	()
Providing sources of information correctly.	()	()	()	()	()
Understanding the meaning of media for the job market.	()	()	()	()	()
Choosing adequate media for specific purposes.	()	()	()	()	()
Understanding the influence of media on society.	()	()	()	()	()
Evaluating the potential effect of violence in the media.	()	()	()	()	()
Understanding why different actors present facts in different ways.	()	()	()	()	()
Distinguishing between real and virtual identities.	()	()	()	()	()
Differentiating between advertising and journalistic content.	()	()	()	()	()
Evaluating the danger of media addiction.	()	()	()	()	()
Using online content in observation to copyrights.	()	()	()	()	()
Dealing properly with cyberbullying.	()	()	()	()	()
Surfing safely on the internet.	()	()	()	()	()
Protecting own data and private sphere effectively.	()	()	()	()	()
Understanding how personal data is gathered and used further while using online media.	()	()	()	()	()

Media use in class

How often do you use the following technologies, software and media resources in class?

	More than once a week	Roughly once a week	Roughly once a month	Less than once a month	Never
Computer laboratory	()	()	()	()	()
Interactive whiteboard	()	()	()	()	()
Data projector	()	()	()	()	()
Laptops, Smartphones, Tablets (students' use)	()	()	()	()	()
Presentation program (e.g., PowerPoint) (students' use)	()	()	()	()	()
Text editor program (e.g., Word) (students' use)	()	()	()	()	()
Spreadsheet program (z. B. Excel) (students' use)	()	()	()	()	()
Digital learning programs or learning games	()	()	()	()	()
Websites (e.g., of organisations, encyclopedias, newspapers)	()	()	()	()	()
Online video platforms (e.g., YouTube, Vimeo, Mediathek)	()	()	()	()	()
Online communication tools (e.g., Messenger, E-Mail, social networks)	()	()	()	()	()
Search engines	()	()	()	()	()

Are there any other technologies, software or media resources that you use at least once a week?

Please enter it here: _____

Internal Resources

Please evaluate according to your perception the following conditions in your school or if necessary, choose „not available“.

	Very good	good	satisfactory	sufficient	insufficient	not available
Availability of didactic material for the <i>Kurs Medienkunde</i>	()	()	()	()	()	()
Support concerning media-related pedagogical matters in the school	()	()	()	()	()	()
Technical support	()	()	()	()	()	()
Principal's support concerning media literacy	()	()	()	()	()	()
Collegial support concerning media literacy	()	()	()	()	()	()
Time for professional development in media literacy	()	()	()	()	()	()
Time to prepare classes	()	()	()	()	()	()
Range of the IT equipment	()	()	()	()	()	()
Quality of the IT equipment	()	()	()	()	()	()
Software available	()	()	()	()	()	()
Speed of the Internet connection	()	()	()	()	()	()
WLAN access in the rooms	()	()	()	()	()	()

External Resources

Have you ever used any training offerings related to media education?

Yes, I have already used the offerings	()	I know there are offerings, but I have never used them	()	I don't know the offerings	()	
Continue here	↓	Continue here	↓	Proceed to the next question	↓	
In general, how do you evaluate the offerings of media education training?			Why haven't you used the offerings? What was the main reason?			
	Very good	good	Satisfactory	sufficient	insufficient	
Range of the offerings	()	()	()	()	()	I didn't have time
Quality of the offerings	()	()	()	()	()	I am not interested
						I don't need it
						Too expensive
						Other reasons

Have you ever used materials available online in your classes (e.g., Mediothek of the Thüringer Schulportal, media data base of the TLfDI)?

Yes, I have already used the materials	()	I know there are materials, but I have never used them	()	I don't know the materials	()	
Continue here	↓	Continue here	↓	Proceed to the next question	↓	
In general, how do you evaluate the materials available online?			Why haven't you used the materials? What was the main reason?			
	Very good	good	Satisfactory	sufficient	insufficient	
Range of the materials	()	()	()	()	()	I didn't have time
Quality of the materials	()	()	()	()	()	I am not interested
						I don't need it
						Too expensive
						Other reasons

Importance of media literacy

We have a few further questions about the topics and skills that the students should have known and developed by the end of their school years. Some of these competencies are listed below. Please indicate how important you believe each of the aspects are.

	Especially important	Very important	Somehow important	Not so important	Not important
Judging the credibility of different information sources.	()	()	()	()	()
Prioritizing attention when multitasking with media.	()	()	()	()	()
Using media in cooperation with others for achieving common goals.	()	()	()	()	()
Filtering and interpreting information from different sources.	()	()	()	()	()
Differentiating between different data formats and using them with the right programs.	()	()	()	()	()
Using technical terms correctly.	()	()	()	()	()
Presenting data in graphics and in tables.	()	()	()	()	()
Making calculations with a spreadsheet program (e.g. Excel)	()	()	()	()	()
Searching for information effectively.	()	()	()	()	()
Choosing media adequately for communicating to different partners.	()	()	()	()	()
Following the adequate norms for online communication.	()	()	()	()	()
Implementing format principles for print media.	()	()	()	()	()
Producing digital media outputs creatively.	()	()	()	()	()
Presenting work results in a digital presentation.	()	()	()	()	()

Media literacy in practice

When you consider the last year, how often have you conducted the following activities / addressed the following aspects with your students?

	very often	often	sometimes	seldom	never
Judging the credibility of different information sources.	()	()	()	()	()
Prioritizing attention when multitasking with media.	()	()	()	()	()
Using media in cooperation with others for achieving common goals.	()	()	()	()	()
Filtering and interpreting information from different sources.	()	()	()	()	()
Differentiating between different data formats and using them with the right programs.	()	()	()	()	()
Using technical terms correctly.	()	()	()	()	()
Presenting data in graphics and in tables.	()	()	()	()	()
Making calculations with a spreadsheet program (e.g. Excel)	()	()	()	()	()
Searching for information effectively.	()	()	()	()	()
Choosing media adequately for communicating to different partners.	()	()	()	()	()
Following the adequate norms for online communication.	()	()	()	()	()
Implementing format principles for print media.	()	()	()	()	()
Producing digital media outputs creatively.	()	()	()	()	()
Presenting work results in a digital presentation.	()	()	()	()	()

Perception of students' media literacy

**How well do the students master the following aspects when they finish school?
Please evaluate the students in general, i.e., independently from individual differences.**

	Very well	well	satisfactorily	sufficiently	insufficiently
Judging the credibility of different information sources.	()	()	()	()	()
Prioritizing attention when multitasking with media.	()	()	()	()	()
Using media in cooperation with others for achieving common goals.	()	()	()	()	()
Filtering and interpreting information from different sources.	()	()	()	()	()
Differentiating between different data formats and using them with the right programs.	()	()	()	()	()
Using technical terms correctly.	()	()	()	()	()
Presenting data in graphics and in tables.	()	()	()	()	()
Making calculations with a spreadsheet program (e.g. Excel)	()	()	()	()	()
Searching for information effectively.	()	()	()	()	()
Choosing media adequately for communicating to different partners.	()	()	()	()	()
Following the adequate norms for online communication.	()	()	()	()	()
Implementing format principles for print media.	()	()	()	()	()
Producing digital media outputs creatively.	()	()	()	()	()
Presenting work results in a digital presentation.	()	()	()	()	()

Opinions about media, education, and society

Please indicate how much you agree/disagree to the following sentences.

	Completely agree	Rather agree	Neither agree nor disagree	Rather disagree	Completely disagree
Media literacy is a life competence, which students definitely need nowadays.	()	()	()	()	()
The precise goals that should be achieved in each subject should be established more precisely in the <i>Kursplan Medienkunde</i> .	()	()	()	()	()
The competence goals in the <i>Kursplan Medienkunde</i> are formulated in an understandable way.	()	()	()	()	()
In my opinion, many aspects that the students should have learnt according to the <i>Medienpass</i> are not taught in our school.	()	()	()	()	()
The <i>Medienpass</i> complements the school report in a meaningful way.	()	()	()	()	()
The idea of the integrative <i>Medienkunde</i> class is very good.	()	()	()	()	()
The implementation of the integrative <i>Medienkunde</i> class works very well in our school.	()	()	()	()	()
The teachers should have as much freedom as possible concerning how to implement the <i>Medienkunde</i> class.	()	()	()	()	()
The contents of the <i>Kursplan Medienkunde</i> fit the subject that I teach.	()	()	()	()	()
Integrating the <i>Kursplan Medienkunde</i> in my subject gives me additional work.	()	()	()	()	()
It is good, if the students can use their private digital devices (smartphones, laptops, etc.) in class.	()	()	()	()	()
Education in media use is primarily the parents' responsibility.	()	()	()	()	()
The students learn about using media adequately anyway without the school.	()	()	()	()	()
Media education is part of one's personal development.	()	()	()	()	()
Social pedagogues should more strongly involve in media education in the schools.	()	()	()	()	()
There should be teachers with a special training in media education in every school.	()	()	()	()	()
There should be teachers that coordinate and support the implementation of the <i>Kursplan Medienkunde</i> in every school.	()	()	()	()	()

Future of the *Medienkunde* class

How should the *Medienkunde* class be implemented in the future? Which of the options below do you prefer?

- The integrative concept should continue.
- The integrative concept should be **complemented** by a stand-alone subject *Medienkunde*.
- The integrative concept should be **replaced** by a stand-alone subject *Medienkunde*.
- Neither the integrative *Medienkunde* class nor a subject *Medienkunde* are necessary.

If you have further remarks or suggestions for the development or improvement of the *Medienkunde* class, we would be happy, if you write them down below. (If there is not enough space, you can include an additional sheet.)

About you

How important are the following media in your private use?

	especially important	very important	rather important	not so important	not important
smartphone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
television	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
social media	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how long you have been working as a teacher:

- I'm in preparation service
- 1–4 years
- 5–14 years
- 15–24 years
- 25 years or longer

Please indicate your age:

- up to 29 years old
- 30–34 years old
- 35–39 years old
- 40–44 years old
- 45–49 years old
- 50–54 years old
- 55 years old or older

Please indicate your gender: female male

In which region is your school located?

<input type="checkbox"/> Altenburger Land	<input type="checkbox"/> Ilm-Kreis	<input type="checkbox"/> Sömmerda
<input type="checkbox"/> Eichsfeld	<input type="checkbox"/> Jena	<input type="checkbox"/> Sonneberg
<input type="checkbox"/> Eisenach	<input type="checkbox"/> Kyffhäuserkreis	<input type="checkbox"/> Suhl
<input type="checkbox"/> Erfurt	<input type="checkbox"/> Nordhausen	<input type="checkbox"/> Unstrut-Hainich-Kreis
<input type="checkbox"/> Gera	<input type="checkbox"/> Saale-Holzland-Kreis	<input type="checkbox"/> Wartburgkreis
<input type="checkbox"/> Gotha	<input type="checkbox"/> Saale-Orla-Kreis	<input type="checkbox"/> Weimar
<input type="checkbox"/> Greiz	<input type="checkbox"/> Saalfeld-Rudolstadt	<input type="checkbox"/> Weimarer Land
<input type="checkbox"/> Hildburghausen	<input type="checkbox"/> Schmalkalden-Meiningen	