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Fostering Media Education Competence Focusing on Diversity: An Action-Oriented Pedagogical Concept for Initial Teacher Education

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Societal processes in mediatization and diversity increase demands on initial teacher education, requiring preservice teachers to develop media education competence focusing on diversity. In the third iteration of a design-based research study, an action-oriented pedagogical concept was further developed and implemented at a German university. This study analyzes competence standard-based pre-post-task solutions from 43 preservice teachers and their semester-accompanying portfolios on selected media education content areas in lesson designs. Results

of the pre-post assessment indicate participants' improvements in outlining the significance of media use and its consequences, describing media education approaches, and reflecting on own lesson designs in a more action- and diversity-oriented manner. The analysis of preservice teachers' portfolios shows that media influences and design characteristics of media messages were particularly considered in the lesson designs, integrating diversity regarding e.g. media representation or the formation of recipients' perceptions. Implications for theory and practice of initial teacher education are discussed.

Gesellschaftliche Prozesse der Mediatisierung und Diversität stellen erhöhte Anforderungen an die Lehrkräftebildung und erfordern von angehenden Lehrpersonen Kompetenz im Bereich der Wahrnehmung von medienbezogenen Erziehungs- und Bildungsaufgaben unter Berücksichtigung von Diversität. Im Rahmen einer gestaltungsorientierten Bildungsforschung wurde in einer dritten Iteration ein handlungsorientiertes pädagogisches Konzept weiterentwickelt und an einer deutschen Universität implementiert. In dieser Studie werden kompetenzstandardbasierte Pre-Post-Aufgabenlösungen von 43 Lehramtsstudierenden und ihre semesterbegleitenden Portfolios hinsichtlich ausgewählter Inhaltsbereiche für die Medienbildung in ihren Unterrichtskonzeptionen analysiert. Die Ergebnisse der Pre-Post-Aufgabe zeigen Verbesserungen bei der Skizzierung der Bedeutung der Mediennutzung und ihrer Konsequenzen, der Beschreibung von Ansätzen zur Medienbildung und der Reflexion eigener Unterrichtsbeispiele in stärker handlungs- und diversitätsorientierter Weise. In den Portfolios wird eine besondere Berücksichtigung von Medieneinflüssen und Gestaltungsmerkmalen medialer Botschaften deutlich, wobei Diversität beispielsweise in Bezug auf die mediale Darstellung oder die Vorstellungsbildung der Rezipient:innen integriert wurde. Implikationen für Theorie und Praxis der Lehrkräftebildung werden diskutiert.

1. Introduction

As the constantly changing media landscape increasingly shapes adolescents' life worlds (Hobbs 2022), developing their media competence is of growing importance (Tulodziecki et al. 2021). Fostering corresponding competence in educational contexts is becoming even more apparent in the light of diversity-related transformation processes in society (Heidkamp-Kergel/Kergel 2022). The increasing mediatization of students' living environments brings both opportunities and risks for education and socialization related to individual conditions (Tulodziecki et al. 2021) and leading to digital divides and inequalities (Verständig et al. 2016; Lythreatis et al. 2022). Simultaneously, diversity, as a constituent characteristic of society (Massumi 2019), is negotiated within media contexts and influences the attribution and perception of social affiliations (Zorn et al. 2019).

To support students in their current and future media actions, teachers need media education competence as part of their media pedagogical competence (Tulodziecki 2012; see chapter 2) that takes diversity into account. This requirement places increased demands on initial teacher education to ensure that preservice teachers are prepared to handle media education tasks, focusing on diversity in school practice (Halsch et al. 2024; 2025). However, comprehensive support to foster preservice teachers' media pedagogical competence has not yet been established in initial teacher education (Senkbeil et al. 2020). Furthermore, the preparation of preservice teachers to address diversity in the

classroom remains insufficiently integrated into teacher education to date (Ryan et al. 2022; Cardona-Moltó et al. 2018).

Against this background, the development and evaluation of theory-based pedagogical concepts for teacher education are crucial to ensure that preservice teachers are prepared to realize media education tasks and adapt to ongoing developments in the media landscape while considering diversity in their lesson planning. This design-based research study (Tulodziecki et al. 2014) aims to further develop and evaluate a theory-based pedagogical concept for higher education (Halsch et al. 2024; 2025). In this context, the following research questions are addressed:

- RQ1: *How do preservice teachers address aspects of media education competence before and after attending a corresponding higher education course focusing on diversity?*
- RQ2: *How do preservice teachers address content areas for media education in their media education lesson designs focusing on diversity?*

2. Theoretical and Empirical Background

2.1 Media Pedagogical Competence

The discussion on media pedagogical professionalization is part of the broader discourse on the professionalization of (preservice) teachers (Tulodziecki/Grafe 2006). Against this background, preparing preservice teachers for media pedagogical requirements in school practice and enabling them to create appropriate

educational settings has become one of the key challenges of teacher education.

The question of how to operationalize competence in a media pedagogical context must be considered in light of the scientific discussion about competence, which is marked by a variety of definitions and related terminology (Erpenbeck et al. 2017; Schaper 2009). In this context, Blömeke et al. (2015) distinguish between a holistic viewpoint of *competence* (plural *competences*), which relates to real-life situations and “observed behavior in context” (ibid.: 4), and an analytical viewpoint of *competency* (plural *competencies*), “refer(ring) to the different constituents of competence” (ibid.: 5). Arifin (2021) also suggests that *competence* as a broader term be defined as “the ability to meet the performance criteria” (ibid.: 761), referring to “task-oriented behavioural approaches” (ibid.: 759), in comparison to *competency* as “a set of knowledge, skills, abilities, attitude, and behaviour” (ibid: 761).

The ability to deal with situational tasks or demands in different fields of action is central to the action theory-based pedagogical competence concept described by Tulodziecki (2013). This competence concept serves as theoretical foundation for the present study.

Likewise, different concepts of media pedagogical competence have emerged in national and international discourse (for an overview, see e.g., Tiede 2020). Based on Baacke’s early work on media competence (see, e.g., 1996), the discourse on media pedagogical competence evolved in German-speaking countries (see

e.g., Schulz-Zander 1996; Tulodziecki 1997; Spanhel 2001). In this context, an action-oriented approach has emerged from the tradition of the Paderborn School (see e.g., Tulodziecki 1997; Blömeke 2000). Against this background, Blömeke (2000) developed a multi-perspective model of media pedagogical competence, building on previous work from Tulodziecki, Baacke, and Schulz-Zander. Furthermore, Tulodziecki (2012) developed a competence standard model for the first phase of German teacher education for three areas of media pedagogical competence. Here, the “realization of media education tasks” is assigned its own area, which stands alongside the areas “use of media to stimulate and support learning processes” and “development of media education concepts in schools” (ibid.: 282, own translation).

In English-speaking discourse, further terminology and concepts of media pedagogical competence for educators are used (see, e.g., McGarr et al. 2021), with the integration of media education perspectives playing a differing role (see, e.g., Halsch et al. 2024). In light of developments in the US, the knowledge-related TPACK model focuses on integrating technology to support teaching and learning processes (Mishra/Koehler 2006), while the ISTE Standards (2024) emphasize educators’ roles in creating innovative learning environments while using technology. Links between German-speaking and US discourse are evident in the further development of TPACK into the DPACK model, integrating requirements for a culture of digitality (Döbeli Honegger 2022). As a further international model, DigCompEdu provides a framework for

the development of digital competence among educators (Re-decker/Punie 2017). The ICT Competency Framework for Teachers (UNESCO 2018) focuses on pre- and in-service teachers' use of information and communication technology.

For this study, Tulodziecki's competence standard model is used as it specifically addresses preservice teachers in the academic phase of university teacher education and explicitly integrates the area of media education competence (Tulodziecki 2012), following the understanding of an action theory-based pedagogical competence concept (Tulodziecki 2013). In this context, media education competence is understood as an area of media pedagogical competence, encompassing the perspectives of *Medienbildung* ("acquisition of media-relevant content and ability in media analysis, media evaluation, and media design from the perspective of reflective action in the field of media") and *Medienerziehung* ("education for reasonable media use"; Tulodziecki et al. 2021: 41, own translation). As these target orientations have converged in media pedagogical discourse, these perspectives are applied jointly in practice, even though different emphases are associated with them (ibid.). However, this differentiation is not fully conveyed by the English terminology (Grafe 2011; 2024). Accordingly, media education, as one area of media pedagogy, is understood in the following as *Wahrnehmung medienbezogener Erziehungs- und Bildungsaufgaben* (realization of media education tasks; Tulodziecki 2012; Tulodziecki et al. 2021). In addition to the explicit integration of the area of media education competence, aimed at realiz-

ing media education tasks, the competence standard model also offers potential for a diversity-based interpretation (see Halsch et al. 2025) and for integrating current developments in the media landscape as content.

2.2 Pedagogical Approaches to Promote Media Pedagogical Competence in Teacher Education

The following empirical studies refer to different target constructs in the field of media pedagogical competence. In this context, especially action-oriented pedagogical approaches, as well as other approaches that assume a high level of learner activation, have proven to foster preservice teachers' media pedagogical competence. E.g., Seufert/Grafe (2020) showed that focusing on lesson phases, guided by an action-oriented teaching and learning model adapted for university teaching, and engaging with complex tasks (Tulodziecki et al. 2021) supported the development of classroom management of preservice teachers in a virtual reality setting. Similarly, Klaß (2020) demonstrates the value of a semester-accompanying design task on media pedagogical lesson planning, introduced at the semester's beginning as part of her study on promoting preservice teachers' media pedagogical competence. Similar approaches have proven successful in other studies specifically aimed at fostering preservice teachers' media education competence (Hahn et al. 2025), and additionally considering social mixed reality and transcultural perspectives (Baumann et al. 2025). Filiz/Kurt (2022) derived positive effects from implementing a flipped learning course design on preservice teachers'

digital competencies. Johnson et al. (2024) showed the added value of peer learning and feedback processes in a training program to foster preservice teachers' DigCompEdu competence. Additionally, critical engagement with current topics proved to be a suitable approach for understanding media bias in the study by Murray-Everett/Harrison (2021) on promoting preservice teachers' critical race media literacy. Here, specific diversity attributes are intertwined with aspects of media education.

Overall, the variety of attempts to model media pedagogical competence in scientific discourse becomes clear, while several pedagogical approaches have proven successful in promoting corresponding competence in initial teacher education. Further theory-based development and evaluation of pedagogical concepts are crucial, especially enabling the targeted promotion of media education competence in teacher education practice (Tulodziecki et al. 2014). Additionally, further research is needed on pedagogical concepts that integrate a diversity-sensitive perspective while fostering preservice teachers' media education competence (Halsch et al. 2024; 2025). Based on a broad understanding of diversity (Auferbauer et al. 2019), links emerge between diversity discourse and media education competence along media education competence standards. Within the discourse outlined on media pedagogical competence (see chapter 2.1), broad consensus is that learners should be supported according to their abilities and learning prerequisites (see e.g., Mishra/Koehler 2006; UNESCO 2018; Tulodziecki 2012). Yet, given individual life circumstances

and the constantly evolving media landscape, not all learners have the abilities, opportunities, or support to develop media competence as a prerequisite for societal, professional, and cultural participation (Tulodziecki et al. 2021; Zorn et al. 2019). Moreover, the media influence how social affiliations are constructed and negotiated and how societal diversity is perceived (ibid.; Gorham 2023). This influence also relates to the media landscape, the design of media content, and the conditions of media production and distribution (Tulodziecki et al. 2021). E.g., Lind (2023) emphasizes the consideration of diversity across audiences, content, and producers in media contexts. Against this theoretical background, the following pedagogical concept to foster preservice teachers' media education competence focusing on diversity was further developed.

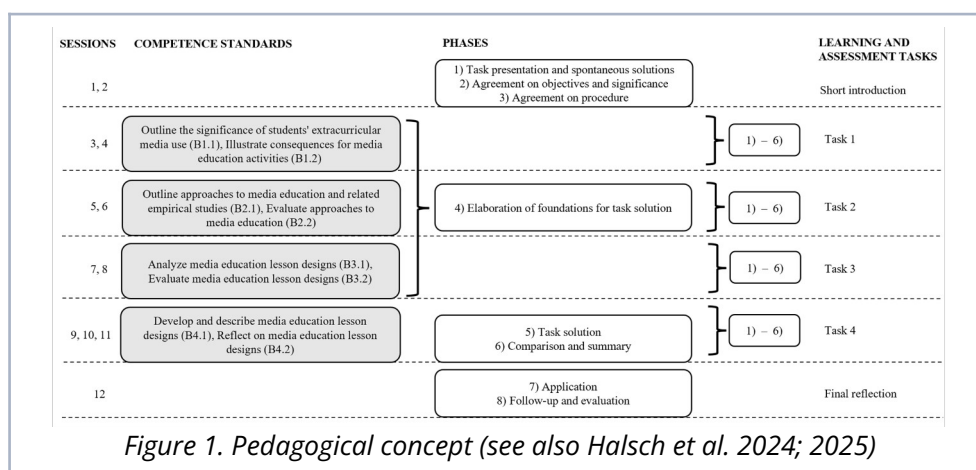
3. Theory-based Pedagogical Concept and Course Design

Following a design-based research approach by Tulodziecki et al. (2014), this study further develops the second version of the pedagogical concept (Halsch et al. 2025). The *pedagogical concept* is based on an action-oriented understanding of teaching and learning (Tulodziecki et al. 2021) adapted to higher educational contexts (Seufert/Grafe 2020). Likewise, the competence standard model for media pedagogy serves as a central framework for the concept development (Tulodziecki 2012). Here, the competence aspects B1 to B4 are operationalized in the form of two competence standards for media education each (ibid.; B1.1 to B4.2; see

figure 1 and table 4). These standards shape the learning objectives and the structure of the course (see also Halsch et al. 2024; 2025). Diversity is integrated along the competence standards in an action-oriented sense (ibid.). This integration includes particularly the consideration of media-related learning prerequisites, taking into account digital divides and inequalities (Verständig et al. 2016; Lythreatis et al. 2022), media representation of social groups as lesson content (Zorn et al. 2019), and (preservice) teachers' own diversity.

Aligned with the concept's action-oriented foundation, the course sessions are guided by eight teaching and learning phases, with complex, situated tasks introduced (phases 1-3) and solved after the necessary foundations have been elaborated (phases 4-6), followed by conclusive phases (phases 7-8; Tulodziecki et al. 2021; Seufert/Grafe 2020; see figure 1). These tasks are implemented in the pedagogical concept in different cycles: Each competence standard-based unit contains a complex task, completed individually in a semester-long learning and assessment portfolio, using scientific literature and addressing two media education competence standards focusing on diversity. As in the previous concept, the course is additionally framed by a complex design task to develop and reflect on an own media education lesson design (according to standards B4.1 and B4.2, see table 3) focusing on diversity, introduced at the start and completed as the final, most extensive portfolio task. Further complex tasks in the course sessions are used to encourage action-oriented engagement with

media education content focusing on diversity (Tulodziecki et al. 2021). Within these situated tasks, aspects of media education are linked to diversity in media contexts (see table 1), e.g., by examining individually daily media routines of adolescents, decision-making in dilemma situations, or evaluating media content regarding the representation of social groups. The fundamental basis of the pedagogical concept was successfully tested for its applicability in previous studies (Halsch et al. 2024; 2025).



The *course design* comprises 12 90-minute sessions structured according to the flipped classroom principle. In these face-to-face sessions, preservice teachers work in self-organized cooperative groups, applying the foundations they developed asynchronously to the complex tasks through collaborative exchange. A digital learning environment is used to provide information and document learning outcomes. Based on the results of the second iteration, the examination of theoretical approaches on the significance of extracurricular media use is strengthened, and corre-

sponding complex tasks are expanded to include different media usage contexts and diversity attributes. Given the revealed lack of diversity-sensitive interpretation of objectives and teaching activities in preservice teachers' task solutions (Halsch et al. 2025), the current concept incorporates case examples supporting diversity awareness in everyday school life. The content selection of the course in terms of media education competence standards focusing on diversity can be found in table 1.

<i>Standards</i>	<i>Content Selection</i>
B1.1, B1.2	Media- and diversity-related living conditions; developments in media landscape, understandings of diversity (dimensions), empirical studies on adolescents' media use focusing on diversity, chances and risks of media use, individual conditions for acting in media contexts (action model, digital divides, and inequalities), action-oriented teaching objectives
B2.1, B2.2	Theoretical approaches to media education (action-oriented media education, inclusive media education), media education in the school curriculum, evaluation perspectives of theoretical approaches
B3.1, B3.2	Action-oriented lesson components and their diversity-related interpretation, exemplary lesson designs, additional information on disinformation and media information gathering considering digital divides and inequalities, (preservice) teachers' own diversity, evaluation perspectives of lesson designs
B4.1, B4.2	Action-oriented lesson planning (lesson phases, complex tasks, and types of preparation), additional information on gender images in the media, peer-feedback on own lesson designs

Table 1. Content specification of the course based on the media education competence standards (Tulodziecki 2012)

4. Methodology

Following the design-based research approach (Tulodziecki et al. 2014), the enhanced pedagogical concept was implemented as described above in four advanced school pedagogy courses at a German university in the summer term of 2024 to analyze how preservice teachers address aspects of media education competence before and after the course (RQ1) in the pre-post-test and media education content areas (RQ2) in their own lesson designs.

The convenience sample consists of $N = 43$ preservice teachers, of whom 35 identified as female and 8 as male. They were, on average 21.2 years old (range: 18–29) and studied, on average in their 3.6 semester (range: 2–10). 19 of the participants were studying in primary education, 13 in secondary education, and 11 in the special needs education program.

Data for RQ1 were collected using preservice teachers' task solutions from a self-developed set of four competence standard-based tasks (Halsch et al. 2025; Hahn et al. 2025; Baumann et al. 2025), which the preservice teachers completed before and after attending the course. These tasks addressed the media education competence standards B1.1 to B4.2 according to the competence standard model (Tulodziecki 2012) as part of a situated assignment (Halsch et al. 2025). The preservice teachers had to complete the task individually within 60 minutes in the first and last courses without aids.

No.	Task assignments
	Imagine you are tasked with preparing a media education lesson design to foster your students' media competence during your supervised pedagogical training in school. The lesson design should be prepared for a selected subject, whereby interdisciplinary work is possible. Refer to an exemplary topic and target group and address the following tasks:
1	Outline the significance of students' extracurricular media use and illustrate resulting consequences that should be considered for your preparation.
2	Outline and evaluate a selected approach to media education that should be considered for your preparation.
3	Analyze and evaluate an existing lesson design for media education that should be considered for your preparation.
4	Combine your previous considerations by describing and reflecting on your own media education lesson design.

Table 2. Task assignments based on Tulodziecki (2012) for the pre-post tasks (see also Halsch et al. 2025; Hahn et al. 2025; Baumann et al. 2025, own translation)

For RQ2, the learning and assessment portfolios completed by the preservice teachers during the semester served as the data source. The focus here was on the preservice teachers' own media education lesson designs focusing on diversity, which were developed as the fourth portfolio task. The portfolio tasks were completed at home over the course of the semester using scientific literature, considering the focus on diversity as an additional stimulus.

No.	Task assignments
1	Design an own media education lesson or project design focusing on diversity with reference to media education approaches and describe learning requirements, objectives, learning and teaching activities, content, social forms of learning, and media.
2	Reflect on your own media education lesson design, taking into account empirical, normative, and practice-related aspects focusing on diversity.

Table 3. Task assignments based on Tulodziecki (2012) for the fourth task in the assessment portfolio (see also Halsch et al. 2025, own translation)

The standard-based category system developed in the previous study (Halsch et al. 2025) was used for the data analysis for RQ1. The development was conducted deductively, based on the media education competence standards B1.1 to B4.2 (Tulodziecki 2012) with an integrated understanding of diversity, which enabled media education competence to be operationalized in their subcategories (ibid.). Furthermore, the Wilcoxon Signed Rank Test was used to investigate whether the differences were significant in preservice teachers' addressing the standards before and after attending the course (Fritz et al. 2012). Additionally, effect sizes were calculated using Pearson's correlation coefficient (ibid.) and interpreted according to Cohen's r (Cohen 1988).

<i>Main categories</i>	<i>Subcategories</i>
B1.1	Outline of significance of students' extracurricular media use for socialization referring to theoretical approaches; outline of significance of students' extracurricular media use for socialization referring to empirical findings; outline of significance of students' extracurricular media use for education referring to theoretical approaches; outline of significance of students' extracurricular media use for education referring to empirical findings
B1.2	Illustration of consequences for media education activities related to socialization referring to theoretical approaches; illustration of consequences for media education activities related to socialization referring to empirical findings; illustration of consequences for media education activities related to education referring to theoretical approaches; illustration of consequences for media education activities related to education referring to empirical findings
B2.1	Outline of approaches to media education; outline of empirical studies related to approaches to media education
B2.2	Evaluation of approaches to media education from an empirical point of view; evaluation of approaches to education from a normative point of view; evaluation of approaches to media education from a practice-related point of view
B3.1	Analysis of learning prerequisites; analysis of objectives; analysis of learning activities; analysis of teaching activities; analysis of content; analysis of social forms of learning; analysis of media
B3.2	Evaluation of media education lesson designs from an empirical point of view; evaluation of media education lesson designs from a normative point of view; evaluation of media education lesson designs from a practice-related point of view

B4.1	Description of learning prerequisites; description of objectives; description of learning activities; description of teaching activities; description of content; description of social forms of learning; description of media
B4.2	Reflection on own media education lesson designs from an empirical point of view; reflection on own media education lesson designs from a normative point of view; reflection on own media education lesson designs from a practice-related point of view

Table 4. Categories for the analysis of pre- and post-tasks, based on Tulodziecki (2012) (see also Halsch et al. 2025; Hahn et al. 2025; Baumann et al. 2025)

The category system for RQ2 was developed deductively from four content areas for media education (Tulodziecki et al. 2021) with an integrated understanding of diversity. The content areas were derived against the background of developments in the media landscape and integrate a perspective of computer science (ibid.).

<i>Main Categories</i>
Media landscape and its digital infrastructure
Design characteristics and generation of media messages
Media influences on the individual and society
Conditions of media production and media distribution

Table 5. Categories for the analysis of the portfolio tasks, based on content areas for media education (Tulodziecki et al. 2021)

Additionally, socio-demographic data were collected using an online questionnaire. The data for both research questions were analyzed with the help of qualitative content analysis according to Mayring/Fenzl (2022). Moreover, 25 % of the data material for RQ1 and RQ2 was coded by a second qualified researcher. As part of an intercoder conference, high interrater values were calcu-

lated for both RQ1 (K = 0.96) and RQ2 (K = 0.93) for the purposes of communicative validation (ibid.; Brennan/Prediger 1981). The preservice teachers' German quotes were translated into English for the following result presentation.

5. Results

In preservice teachers' solutions to the pre-post tasks (see RQ1), a total of 1,070 codes were recorded. The following results relate to the addressing of media education competence standards and associated subcategories per person.

5.1 Outline the Significance of Students' Extracurricular Media Use for Socialization and Education (B1.1) and Illustrate Consequences Resulting from B1.1 for Media Education Activities (B1.2)

The significance of extracurricular media use was addressed by one preservice teacher in the pre-test and by 18 in the post-test. In the pre-test, one participant connected the *significance of students' media use for socialization to empirical findings*, compared to 14 preservice teachers in the post-test, referring to studies on adolescents' media use and related media phenomena, such as:

Students may also already have had negative experiences on social networks, e.g., having been confronted with offensive comments [...] as shown in the JIMplus study on hate speech. According to the study, members of marginalized groups are particularly affected (PT 6, post).

In this context, discussions on media equipment and frequency of use, and, in some cases, differences in media access and use related to diversity attributes (e.g., regarding family resources or disability) were incorporated. References to the *significance for education* were barely related to empirical findings (pre: 0, post: 1). References to *theoretical approaches* increased slightly for *socialization* (pre: 0, post: 4) and *education* (pre: 0, post: 2), and occasionally mentioned the digital divide, e.g., stating “when using media, social structures from the real world are reproduced and enforced” (PT 41, post). One preservice teacher also addressed a theory-based action model.

While one preservice teacher described resulting consequences in the pre-test, 12 did so in the post-test. Regarding *consequences for media education activities*, emphasis was on raising awareness and orientation for students’ media activities and considering different learning requirements in terms of experience and knowledge. E.g., one preservice teacher illustrated as a consequence the importance

to promote the media skills of everyone at an early stage, regardless of social background, in order to counteract a digital divide and discrimination based on this (PT 8, post).

The consequences were more pronounced in terms of *socialization* (related to *theoretical approaches* pre: 0, post: 3; related to *empirical results* pre: 1, post: 7) than in terms of *education* (related to *theoretical approaches* pre: 0, post: 3; related to *empirical results* pre: 0, post: 1).

5.2 Outline Approaches to Media Education and Related Empirical Studies (B2.1) and Evaluate Approaches to Media Education (B2.2)

In the pre-test, eight preservice teachers described *theoretical approaches to media education*, increasing to 34 in the post-test, most focusing on action-oriented media education. Further approaches were considered in individual task solutions, such as inclusive media education, which

assumes that media are particularly relevant for inclusion because they enable opportunities for participation and integration (PT 41, post).

Related empirical studies were mentioned only in one post-task solution, referring to media influences on the opinion formation of adolescents.

Beyond that, seven preservice teachers evaluated the theoretical approaches described in the pre-test and 17 in the post-test. Especially *evaluations from a normative point of view* increased (pre: 5, post: 13), addressing the learners' role in the teaching-learning process in several task solutions. The action-oriented media education approach was attributed with potential to foster self-determined media actions "because learners are perceived as active participants in a world shaped by media" (PT 38, post). One preservice teacher valued this approach for promoting "both practical action skills and reflective engagement with media" (PT 9, post). *Evaluations from a practice-related point of view* were provided by seven preservice teachers in the pre-test and 11 in the post-test, addressing methodological and organizational factors

such as time constraints and media resources for implementing these approaches in school. Notably, theoretical approaches were not evaluated from an *empirical point of view*, in either the pre- or post-test.

5.3 Analyze (B3.1) and Evaluate (B3.2) Media Education Lesson Designs

15 preservice teachers analyzed a media education lesson design in the pre-test, compared to 23 in the post-test. The largest increases were in *learning activities* (pre: 6, post: 17) and *content* (pre: 10, post: 16). References to *objectives* (pre: 6, post: 9), *teaching activities* (pre: 6, post: 7), and *social forms* (pre: 4, post: 6) grew slightly, while the number of preservice teachers referring to *learning prerequisites* stayed at 2. References to *media* decreased from 9 pre- to 4 post-task solutions. In the pre-test, participants relied mainly on their own school experiences. In the post-test, they frequently drew on lesson designs discussed in the course and emphasized students' development of possible courses of action, e.g. "draft[ing] a proposal for how to behave as a person affected by cyberbullying" (PT 32, post). Furthermore, preservice teachers integrated complex tasks and case examples more frequently in the post-test.

Evaluations increased (pre: 14, post: 17), particularly from a *practice-related point of view* (pre: 9, post: 14). Participants commented on the suitability of the example for the students' diverse learning requirements and considered possibilities and challenges for the practical implementation of the approaches. *Evaluations from a*

normative point of view rose from 11 preservice teachers in the pre-test to 15 in the post-test, discussing the weighting of media opportunities and risks within the lessons. Several participants evaluated the lesson designs' theoretical foundations, e.g., from an action-oriented perspective emphasizing student activation and self-determination:

[...] the project example meets the educational requirements for contemporary media education. It supports students in developing critical thinking skills and encourages reflection on their own media use and the societal impact of disinformation (PT 9, post).

Some post-task solutions also included references to the state school curriculum. While no *evaluations from an empirical point of view* were conducted in the pre-test, two participants justified the chosen topic based on empirical results in the post-test.

5.4 Describe (B4.1) and Reflect (B4.2) Media Education Lesson Designs

Except for learning prerequisites and social forms, the description of lesson components was already included in 41 pre-task solutions and decreased slightly to 39 in the post-test. When the preservice teachers developed their own lesson designs, these descriptions either increased (*learning prerequisites* pre: 7, post: 14; *learning activities* pre: 33, post: 35; *teaching activities* pre: 24, post: 31, and *social forms* pre: 16, post: 26) or decreased (*objectives* pre: 33, post: 26; *content* pre: 36, post: 35, and *media* pre: 29, post: 27). The changes shifted from describing rather instructive teaching activities in the pre-test to the active development of possible courses of action as learning activities, with increased

mention of moderating teaching activities. Several preservice teachers embedded action-oriented lesson phases or complex tasks in the post-test, e.g.,

a complex evaluation task in which learners assess decisions made by influencers for or against certain advertising partners (PT 38, post).

Lesson content covered various content areas, emphasizing media influences, such as social media's effects on self-perception, media design characteristics, including dealing with AI-generated images, and the media representation of diversity.

Preservice teachers reflecting on lesson designs increased from 14 to 20. Those reflecting from a *normative point of view* grew from 8 to 15, emphasizing the lessons' present and future relevance for students. In the post-test, participants reflected on their own designs in light of action-oriented media education objectives, such as:

At the same time, the target perspective of socially responsible action is included, as recognizing and classifying fake news is essential for counteracting the spread of fake news and the formation of false opinions based on it [...] (PT 8, post).

In some post-task solutions, participants referred to the state school curriculum and to legal norms concerning fundamental rights and data protection, while one participant focused on negotiating social norms related to model portrayals in television shows. *Practice-related reflections* rose slightly (pre: 10, post: 12), considering available resources and the learning supportiveness

of pedagogical elements (e.g., group work and peer exchange). Several participants also addressed teachers' options for differentiating instruction to students for teaching activities, such as choosing topics according to different learning prerequisites. While there were no *reflections from an empirical point of view* in the pre-test, four preservice teachers referred to empirical studies in the post-test to emphasize the relevance of the chosen topic in the students' everyday lives.

In addition to the qualitative data analysis, the Wilcoxon Signed Rank Test revealed significant changes for standards B1.1, B1.2, B2.1, and B4.2 in the pre-post comparison. High effect sizes were observed for standards B1.1 and B2.1, and medium effect sizes for standards B1.2 and B4.2. No significant changes were found for standards B2.2, B3.1, B3.2, and B4.1, all of which had small effect sizes.

<i>Main Category</i>	<i>PRE</i>	<i>POST</i>	<i>DIFF</i>	<i>z</i>	<i>p</i>	<i>r</i>
B1.1 (4 subcategories)	1	21	20	3.70	<.001*	.56
B1.2 (4 subcategories)	1	14	13	3.13	.002*	.48
B2.1 (2 subcate-	8	35	27	4.85	<.001*	.74

gories)						
B2.2 (3 subcategories)	12	24	12	1.61	.108	.24
B3.1 (7 subcategories)	43	61	18	1.22	.223	.19
B3.2 (3 subcategories)	20	31	11	1.69	.091	.26
B4.1 (7 subcategories)	178	194	16	1.03	.304	.16
B4.2 (3 subcategories)	18	31	13	2.10	.036*	.32
Total	281	411	130	* Significance at a level of 0.05		

Table 6. Total number of adequately addressed subcategories of media education competence standards per participant

Regarding content areas of media education, a total of 367 codes were recorded in preservice teachers' lesson designs for the fourth portfolio task (see RQ2).

5.5 Media Landscape and its Digital Infrastructure

Several preservice teachers addressed the media landscape in their lesson designs, though less frequently than the other content areas. They referred to different media types, the variety of media offerings, and their usage contexts. These perspectives were used by several preservice teachers as lesson introductions, as in the following:

As a thematic introduction, there is an exchange in the plenum about which digital media the pupils know, own, and for which purposes they frequently use them. Due to different diversity characteristics, the contributions of the pupils will show differences in interests and the availability of devices (PT 23).

However, only one preservice teacher referenced the digital infrastructure, focusing on the context of digital connectivity based on algorithms:

Possible discussion points include increasing the reach and findability of information through the search function for hashtags and through algorithms in social networks (PT 6).

5.6 Design Characteristics and Generation of Media Messages

The vast majority of all portfolios included references to design characteristics, which frequently were the focus of the lesson designs. These covered various types of media designs, particularly recognizing the characteristics of disinformation or entertainment media and digital advertising, such as:

They create an advertising poster for a product of their choice and pay attention to color scheme, images, slogans, and the intended effect (PT 42).

Many preservice teachers aimed to help students understand and apply these characteristics to appropriately assess current media phenomena. Technical design characteristics, such as photography basics and image editing, were addressed in individual portfolios:

The students determine on their own that not everything they see on social networks is real, by comparing edited and unedited photos (PT 25).

Diversity representation in media designs was focused on in several lesson designs, including character portrayal in video games, gender stereotypes in advertising, and staging patterns in social networks, as well as diversity in the film landscape. Individual portfolios addressed AI-related design issues, e.g., with regard to recognizing deepfakes or AI-based image creation.

5.7 Media Influences on the Individual and Society

Media influences were the most emphasized area in most lesson designs. Along with design characteristics, they constitute the majority of coded data and are addressed in nearly all portfolios. The focus was on media influences on behavioral and value orientations, particularly regarding purchasing behavior, as in the following:

A suggested sense of belonging, being part of a community, or building a personal bond with the influencers makes many children particularly receptive to well-placed advertising from influencers [...] (PT 8).

Several preservice teachers also considered the media's influence on the formation of perceptions or political opinions, mainly regarding misleading views, e.g., related to gender, body images, or beauty ideals. They also addressed emotional influences, reflected on personal well-being, and proposed strategies for action. Few preservice teachers considered the media's influence on societal contexts, particularly its role in shaping societal discourse:

The students (discuss) [...] the extent to which social networks and hashtags play a role in social movements and how they change or have changed the visibility and dynamics of such movements (PT 6).

5.8 Conditions of Media Production and Media Distribution

Similar to the media landscape and its digital infrastructure, conditions for media production and distribution received less attention. Nevertheless, nearly half of the preservice teachers referenced this area, mainly focusing on legal aspects, such as copyright, data protection, and app guidelines. A few portfolios emphasized economic conditions, including advertising strategies and influencer marketing, such as:

To this end, individual (influencers) can be taken as examples and analyzed with regard to their advertising activities through joint research work in class discussions [...] (PT 8).

Individual preservice teachers addressed political conditions, focusing on media manipulation and bias for political purposes, e.g., regarding social groups. Cultural influences on media production appeared in individual portfolios, e.g., by examining in class “how the ethnic background of the author of an article influences it” (PT 10). One preservice teacher discussed the chemical industry’s role as a technical condition for chemistry lessons. Personal conditions, such as the proportion of women in game development, were mentioned in the lesson reflections but not as lesson content.

6. Discussion

According to RQ1, the preservice teachers’ task solutions revealed references to all media education competence standards, although the way and frequency varied before and after the course.

When *outlining the significance of students’ media use for socialization and education* (B1.1), many preservice teachers addressed the competence standard in a more theory- and evidence-based way in the post-test compared to the pre-test. This finding aligns with the evidence-based emphasis of the first course unit, which was reinforced by the results of the previous study (Halsch et al. 2025). Despite this improvement, 25 preservice teachers did not adequately reference standard B1.1, reflecting studies that indi-

cate a lack of corresponding competence among preservice teachers (Besa et al. 2023). Although the task assignment did not explicitly require theoretical or empirical references, (preservice) teachers are expected to be able to make evidence-based pedagogical decisions and design lesson plans drawing on theory and empirical research (Rochnia et al. 2022; Böttcher-Oschmann 2021). This expectation reflects a core objective of academic teacher education, enabling preservice teachers to acquire “scientific foundations for professional ability of action” (Tulodziecki 2012: 283, own translation). References to the *significance for education* are less common in B1.1 and B1.2 and should therefore be reinforced in the pedagogical concept. Furthermore, most preservice teachers were able to *outline a theoretical approach to media education* when explicitly tasked to do so, according to B2.1 in the post-test.

This ability also aligns with the previous study results (Halsch et al. 2025), and with research investigating planning decisions in preservice teachers’ written lesson plans by König et al. (2020), who found that preservice teachers’ demonstrated planning skills were related to teacher educators’ communication of lesson plan requirements. According to B2.1, little to no discussion of empirical studies related to media education approaches was provided, consistent with the findings of the previous study (Halsch et al. 2025). This may be due to the fact that the relation to empirical results was not part of the task assignment, even if the assignment is formulated similarly to the outline of theoretical ap-

proaches in the standard (see figure 1). Against this background, expanding the task assignment for future data collection to include empirical results in standard B2.1 seems reasonable.

When *analyzing* (B3.1) and *describing media education lesson designs* (B4.1), learning and teaching activities and content were frequently described in the pre-task solutions. Preservice teachers in their 3.6 semester on average appear to possess prior knowledge of teaching and learning processes (see also Halsch et al. 2025). The partly observed decline in references to lesson components may reflect preservice teachers' broader focus in the post-test, as they addressed more standards per person within a limited time. The variety of lesson topics chosen, which, e.g., included AI repeatedly for the first time in this research project, indicates that initial teacher education is taking place against the backdrop of a changing media landscape. Furthermore, these developments must be addressed by educational institutions due to students' extracurricular media use and its significance for education and socialization (Tulodziecki et al. 2021). This highlights the potential for adapting educational standards in terms of content within the competence standard model to allow interpretation based on current developments (Tulodziecki 2012).

Evaluation of media education approaches (B2.2), *media education lesson designs* (B3.2), and *reflections on own lesson designs* (B4.2) revealed clear differences in perspective use. Empirical perspectives were almost absent in the pre-test and rare in the post-test, while several preservice teachers already employed normative

and practice-related perspectives in the pre-test. These increased in the post-test and were often more theory-based, aligning with the previous study (Halsch et al. 2025). References to action-oriented objectives and school curricula reflected the course content.

The emphasis of the course on action-oriented media education likely promoted its frequent integration into the post-task solutions across all competence aspects, as this approach was discussed intensively in the course and structured the sessions. Semester-long work on the portfolio assignments, aligned with the media education competence standards and their subcategories, may also have aided preservice teachers solving the post-test. This also applies to the integration of diversity aspects in preservice teachers' task solutions, which were not explicitly required in the assignment but emphasized in course content and portfolio work. References to diverse learning prerequisites already appeared in the pre-test and increased in the post-test, with diversity also considered in normative evaluations, reflections and diversity-related lesson content. While already addressed in the standards, enhancing diversity-oriented lesson planning in the pedagogical concept could support preservice teachers in more systematic integration.

The Wilcoxon Signed Rank Test and effect size calculations revealed significant changes for standards B1.1 and B2.1 with high effect sizes, as well as for standard B4.2 with a medium effect size, consistent with the previous study (Halsch et al. 2025). A sig-

nificant change with medium effect size was also found for B1.2, reflecting the strengthened first thematic unit in concept development (ibid.). No significant changes occurred for B2.2, B3.1, B3.2, and B4.1, while qualitative analysis revealed content changes and an increased focus on action- and diversity-oriented addressing of the standards in many post-task solutions. Compared to the previous study, preservice teachers already demonstrated stronger alignment with standards B2.2 and B3.2 in the pre-test, highlighting the study's limitation of relying on a convenience sample.

Regarding RQ2, the preservice teachers addressed various content areas of media education in their semester-accompanying lesson designs, emphasizing design characteristics of media messages and media influences. This distribution reflects the focus on these content areas within the course. The frequent references to media's complex influences on the individual and society highlight the need for media education in schools, which should not only promote appropriate technology use but also foster reflective media engagement as part of comprehensive media competence, aligning with the course objectives (Tulodziecki 2012). This corresponds to RQ1 findings, in which many preservice teachers emphasized the promotion of self-determined and reflexive media use. Diversity was addressed in the lesson designs, particularly regarding media influences and the representation of diversity attributes in media products. This aligns with the course's learning activities on analyzing media or lesson designs regarding media diversity representation, as well as with the diversity-sensitive in-

terpretation of content in the lesson designs of the previous study (Halsch et al. 2025).

Preservice teachers rarely chose the media landscape and its digital infrastructure as the main lesson content; instead, considering the diversity of the media landscape served as an introduction in several lesson designs. Aspects of media production and distribution conditions are often addressed in the lesson reflections but are less incorporated into descriptions of lesson content. This discrepancy may stem from limited knowledge of these areas or a stronger perceived relevance of others. As critical reflection on the structural conditions of the media landscape (Lind 2023) was evident in individual portfolios and is relevant for media education focusing on diversity, preservice teachers should be encouraged to further engage with these areas in future iterations.

Most lesson designs aim to support students in developing strategies for acting competently in various media contexts along the content areas, enabling them to handle their mediatized everyday lives and to be capable of shaping them (Tulodziecki et al. 2021; Hobbs 2022). References to specific media phenomena identified in RQ1 according to standard B1.1 were also evident in task solutions of several portfolios. The portfolios also included several references to AI for the first time across the three iterations, displaying the dynamically evolving media landscape. Consequently, the content areas of media education, as well as the media education competence standards, must remain adaptable to current developments (Tulodziecki 2012). In general, the analysis of the semes-

ter-accompanying portfolios revealed more detailed lesson design descriptions, suggesting that combining both data sources offers deeper insight into preservice teachers' learning outcomes (see also Halsch et al. 2025).

Nevertheless, the present study must be considered within its limitations. As this study is based on a convenience sample, the results cannot be generalized. The high complexity of the pre-post task, which required consideration of all four competence aspects in a short period of time in the context of lesson preparation, must be noted. Additionally, a few participants did not complete the pre-post task entirely. The methodology allows only limited conclusions about the quality of the preservice teachers' task solutions. Furthermore, additional independent variables were not examined.

7. Conclusion and Outlook

In this study, a theory-based pedagogical concept aimed at fostering preservice teachers' media education competence focusing on diversity was further developed and evaluated in its implementation at a German university. According to RQ1, the results revealed a stronger action- and diversity-oriented argumentation within preservice teachers' competence standard-based task solutions in the post-test. Additionally, calculated significance and effect sizes improved in addressing media education competence standards B1.1, B1.2, B2.1, and B4.2 after the intervention. In relation to RQ2, preservice teachers addressed the design charac-

teristics of media messages and media influences on the individual and society as media education content areas in their semester-accompanying lesson designs more frequently than the media landscape and its digital infrastructure, as well as conditions for media production and distribution. They considered diversity across all areas and as lesson content in different ways, such as media representation or the formation of recipients' perceptions.

Overall, the outlined results indicate that the pedagogical concept has potential to foster preservice teachers' media education competence focusing on diversity. In this context, previous findings demonstrating the benefits of integrating action-oriented approaches into initial teacher education (Seufert/Grafe 2020; Halsch et al. 2025; Hahn et al. 2025; Baumann et al. 2025) can be confirmed.

As part of a broader project in terms of practice- and theory-driven development and evaluation of pedagogical concepts (Tulodziecki et al. 2014), the results of this study contribute to refining and evaluating the pedagogical concept in the ongoing iterative research process. This way, the study aims to link requirements for integrating media education and diversity in theory and practice of initial teacher education to prepare preservice teachers for the realization of media education tasks in schools while integrating the perspective of diversity.

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