ICT-related Educational Competencies of Teacher Educators from an Intercultural Perspective. A Systematic Analysis of Competency Frameworks.

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Abstract: Both research and policy indicate the importance of considering ICT-related and intercultural competence development in education together. Teacher educators play a significant role in the development of these related competencies. The aim of this study is to analyze ICT-related competence frameworks addressing teacher educators, focusing on how they incorporate intercultural considerations. We analyze four internationally recognized models—Teacher Educator Technology Competencies (TETCs), DigCompEdu, Jisc Digital Capabilities, and Media Didactica —showing that with the TETCs important steps have been taken to integrate both discourses, while the other frameworks treat aspects related to culture as isolated phenomena. In TETC 8, the global dimension is represented by a specific competency, which is also differentiated into specific areas of competence. This offers a strong starting point for further international discourse, in terms of both the diversification of underlying theoretical concepts and approaches to culturally responsive education. Further research is needed to investigate how professional development can meet the needs of teacher educators in a global context.

Introduction

Policymakers and researchers across disciplines and educational contexts agree that teacher educators play a vital role in preparing preservice teachers for their future responsibilities. From a pedagogical perspective, teacher educators serve as role models for prospective teachers (Uerz et al., 2018) and their development of media-related educational competencies in a world increasingly characterized by digitalization and mediatization (Tondeur et al., 2019, Foulger et al., 2016, 2017). Similarly, from global citizenship education or intercultural competence-oriented perspectives, both policy and research stress the need for teacher educators to prepare preservice teachers for the challenges connected to teaching and learning in a world marked by globalization and diversity (Baroni et al., 2019, Mansilla & Jackson, 2011, Cochran-Smith et al., 2020). Therefore, teacher educators need to be both digitally and interculturally competent to prepare preservice teachers for contemporary and future education. Due to the significant intersection of these two requirements, it is valuable to consider media-related and intercultural competences for teacher educators together.

The aim of this paper is to analyze if and how frameworks related to teacher educators' ICT-related competencies address issues about teaching and learning in a globally connected world. These frameworks will be deconstructed and discussed against the background of underlying concepts from intercultural research across disciplines and, where necessary, related fields. Our aim is to offer a starting point for discussions of media-related competence in the context of international and intercultural pedagogy.

Literature Review

Following Kim and Bhawuk's definition of globalization as "a technologically driven process of change toward increased interconnectedness and functional interdependence among people across societies and nations" (Kim & Bhawuk 2008, p. 301), our literature review will explore how the emerging requirements for teacher

educators in terms of ICT-related and intercultural competencies have been addressed in their respective research discourses.

Research around teacher educator competencies has been mapping demands for and modeling ICT-related competencies for about 30 years. A systematic comparative study on media-related competency frameworks by Tiede and Grafe (2020) indicated that a number of studies have been conducted to explore teacher educators' ICT-related competence development. At the same time, the authors emphasized that further international comparative research is needed to facilitate the systematic advancement of teacher educators' ICT-related professional development, echoing similar recommendations by Krumsvik (2014), Borthwick and Hansen (2017), and Foulger and colleagues (2017). A systematic literature review by Uerz et al. (2018) found that there are significantly fewer studies on media-related educational competencies for teacher educators compared to corresponding studies focusing on preservice or inservice teachers. Tiede and Grafe's category-based comparison of three ICT-related competency models for teacher educators—the Teacher Educator Technology Competencies (TETCs) model (Foulger et al., 2017), the Belgian Media Didactica Framework (Meeus et al., 2014), and the European DigCompEdu framework (Redecker, 2017)—showed that the three share central assumptions and overlap widely but also represent national singularities and research discourses (Tiede & Grafe, 2020). The TETCs, for instance, were developed in response to a call by the United States' National Education Technology Plan (NETP) (Foulger et al., 2016, 2017), while the DigCompEdu framework evolved from the DigComp model, which was developed in 2012 as a framework for all citizens of the EU with the aim of meeting the "digital revolution" that encompasses all spheres of life (Caena & Redecker, 2019). Schröter and Grafe's (2020) systematic analysis of frameworks addressing digital literacy and digital competence in university teachers concluded that more explication of underlying theoretical concepts would be helpful and that measuring digital literacy and competence among teacher educators remains a challenging task (Uerz et al., 2018). The competency frameworks for teacher educators used for this study vary in their reach within the literature. The Media Didactica Framework (Meeus et al., 2014) is mentioned only sporadically in current media education research on teacher educators (Tiede & Grafe, 2020; Ripka et al., 2020). The two frameworks that do not exclusively refer to teacher educators, DigCompEdu and Digital Capabilities (Jisc), are widely referenced in the literature. Although studies on teacher educators are underrepresented, international examples can be found (Fulgence, 2020; Tiede & Grafe, 2020; Laudari, 2019). Especially with regard to the TETCs, it is clear that an international discourse focusing on teacher educators has developed, including different levels of action around media-related educational competencies. Studies by Carpenter et al. (2020), Luongo (2019), and Viberg et al. (2019), for example, explore teacher educators' perspectives on TETCs. Other studies, such as Krutka et al. (2019) and the current paper, aim to contribute to the explication of individual competencies. A number of studies also describe the design and implementation of professional development based on TETCs (e.g., Foulger et al., 2020, Slykhuis et al., 2019). Until now, ICT-related teacher educator competency frameworks have not been analyzed in terms of their approach to intercultural aspects; in this paper, we seek to address this research gap.

In order to juxtapose ICT-related competency frameworks for teacher educators with aspects related to intercultural research, it is important to acknowledge the robust body of research within this complex multidisciplinary field, which spans six decades (Deardorff & Arasaratnam-Smith, 2017). These discourses vary significantly across national contexts and distinct cultural milieus (Spitzberg & Changnon, 2009, Arasaratnam-Smith 2017), although numerous reviews have been published on the concept of intercultural competence in an international perspective (Rathje, 2007; Spitzberg & Chagnon 2009). Deardorff and Arasaratnam-Smith (2017) point out that, due to the wide interest in intercultural competence in multiple disciplines, nuanced and varied labels of this concept are used, which creates challenges for those seeking common ground. A literature review by Fantini (2020) reveals that more than 50 terms coexist in the literature to date to denote "abilities needed for intercultural interaction" (ibid.). However, some researchers do agree on the definition of intercultural competence as "a set of cognitive, affective and behavioural skills and characteristics" (Bennett, 2015, xxiii, as cited in Fantini, 2020).

The review by Fantini (2020) shows that the models that are frequently applied and referred to in education and research—namely Bennett's Developmental Model of Intercultural Sensitivity (DMIS) (Bennett & Bennett, 1993), the model by Byram, Nichols and Stephens (Byram et al., 2001), and Deardorff's model (Deardorff, 2006)—were developed within monolingual and monocultural milieus and have therefore been the subject of critique in terms of Anglocentrism. Additionally, none of the models above address teacher educators specifically, but either focus on the student perspective or are intentionally generic so that they may be applied to various stakeholder groups. Dervin et al.'s (2020) critique takes this a step further by arguing that these intercultural competence

models, and in fact any discourse about intercultural competence, are charged with political, sociological, personal, and glocal ideologies (ideologemes). With a particular focus on teacher education, they conclude that intercultural competence discourse in (teacher) education is currently in a state of crisis for the reasons mentioned above and call for "fairer ways of constructing intercultural competence" (Dervin et al., 2020, p. 6).

Since the 1990s, the interconnectedness between digital media and intercultural communication has been a subject of interest in research (Chen, 2012), as the compression of spatial and temporal relations through digital communication has changed people's local, national, and global perceptions of space and, as a consequence, the nature of community or culture (ibid.). In this process, a new form of intercultural communication emerged (ibid.), characterized by new social networks, which has since become a major concern for intercultural scholars (for a more comprehensive review see Chen, 2012). A systematic literature review on intercultural competence development via digital technologies by Çiftçi (2016) revealed that previous studies mainly address undergraduate students and pointed to the need for interculturally competent educators to consciously guide participants (Çiftçi, 2016). One can conclude that there is a similar gap in intercultural research with regard to ICT-related competencies for teacher educators.

In this study, we focus on frameworks related to teacher educators' ICT-related competencies and address the research question of how such frameworks reference teaching and learning in a globally connected world.

Methodology

In order to identify relevant frameworks, we combined the findings from previous literature reviews conducted by Tiede and Grafe (2020) and Schröter and Grafe (2020), who systematically analyzed ICT-related competence frameworks for teacher educators and teachers in higher education internationally. Tiede and Grafe (2020) used two sources of data. Firstly, they referred to an extensive literature review by the Joint Research Centre (Joint Research Centre, 2017). Secondly, they conducted an additional literature review using several established databases including ERIC and the Social Science Citation Index. This led to the identification of three frameworks: 1) TETCs (Foulger et al., 2017), which refers specifically to teacher educators; 2) Media Didactica (Meeus et al., 2014), which has a specific version for teacher educators; and 3) DigCompEdu (Redecker, 2017), which addresses educators at all stages, including teacher educators. Schröter & Grafe (2020) used the databases ERIC, Web of Science, ResearchGate, and Google Scholar, focusing on frameworks that explicitly address teacher educators, are internationally relevant, and are currently providing a basis for research. They identified the remaining models: 1) TETCs (Foulger et al., 2017); 2) DigCompEdu (Redecker, 2017); and 3) Jisc's Digital Capabilities (Jisc, 2014). We decided to combine the results and use the literature from both studies. This resulted in the following competence models: TETCs, DigCompEdu, Digital Capabilities, and Media Didactica.

Tiede (2020) developed categories for the comparative analysis of ICT-related competency frameworks for teacher educators: 1) Model background; 2) Model genesis; 3) Model structure; and 4) Model contents. In accordance with our aim to identify and discuss aspects that can be linked to intercultural competence, our analysis will focus on the content of the frameworks and will only briefly refer to their respective backgrounds, geneses, and structures as needed for clarity. The selected frameworks will be evaluated for terms or concepts from the selection presented by Fantini (2020), including or relating to cross-cultural adaptation, cross-cultural awareness, cross-cultural communication, cultural competence, cultural or intercultural sensitivity, effective intergroup communication, ethnorelativity, global competence, global competitive intelligence, global mindedness, global mindset, intercultural competence, intercultural cooperation, intercultural effectiveness, intercultural interaction, international communication, international competence, metaphoric competence, multiculturalism, plurilingualism, and transcultural communication. Since this selection only represents a partial list (ibid, 33), we will be mindful to include other concepts that may be linked to digital interaction in an intercultural dimension.

Analysis
TETCs

The Teacher Educators Technological Competencies (TETCs) model was developed in 2017 in response to the National Education Technology Plan (NETP) (Foulger et al., 2017). The process included a literature review supported by crowdsourcing, a six-round Delphi study, and a call for feedback from the research community (ibid.). Twelve competencies with three to five descriptors each were synthesized in a structured model. Among the 12 competencies, TETC 8 is relevant for our analysis because it addresses "abilities needed for intercultural interaction" (Fantini, 2020):

Teacher educators will use technology to connect globally with a variety of regions and cultures (Foulger et al., 2017, 433).

The competency is subdivided into three aspects representing different facets of the teacher educator's role, as defined by TETC 8:

> *a) [Teacher Educators will m]odel global engagement using technologies to connect teacher candidates with other cultures and locations* (Foulger et al., 2017).

This implies that a teacher educator must be able to act with intercultural competence in digital settings in order to be able to fulfill their normatively established role model function (cf. Tondeur et al., 2019, Foulger et al., 2016; 2017). Foulger et al. (2017) explicitly refer to the International Society for Technology in Education's (ISTE) contributions as "standards and guidelines that influence our work" (Foulger et al. 422). The ISTE standards for educators state that teachers are required to "demonstrate cultural competency when communicating with students, parents and colleagues" (4d) and to "actively participate in local and global learning networks" (1a) (ISTE, n.d.-a). The example set by teacher educators through their teaching and mentoring activities enables preservice teachers to act with cultural competence in their (digital) classroom and professional community activities.

> *b) Teacher Educators will design instruction in which teacher candidates use technology to collaborate with learners from a variety of backgrounds and cultures* (Foulger et al., 2017).

The second aspect of the competency relates to didactic design processes. Again, the experiential approach through which the preservice teachers learn to collaborate interculturally is emphasized. This competence aspect can be linked to the ISTE standard for educators to "[u]se collaborative tools to expand students' authentic, real-world learning experience by engaging virtually with experts, teams and students, locally and globally" (ISTE, n.d.-a). Again, this corresponds with the ISTE standards for students, who are required to be "global collaborators" (ISTE, n.d.-b), and it may also be aligned with the standard for coaches, who are required to "partner with educators to identify digital learning content that is culturally relevant" (ISTE, n.d.-c).

> *c) [Teacher Educators will a]ddress strategies needed for cultures and regions having different levels of technological connectivity* (Foulger et al., 2017).

The third aspect of this competency addresses awareness of and capacity to deal with connectivity differences on a potentially global level. This has two important implications. First, teacher educators must themselves have an awareness of the interactions between connectivity and potential global opportunities for participation and resulting discourses of power, and they must also communicate this to their students. Second, teacher educators must be able to select and integrate technologies and tools flexibly, according to local requirements and objectives, and to communicate this knowledge to future teachers. However, it should not only be about knowing and being able to contextualize global differences in terms of ICT infrastructure and connectivity. In TETC 8.3, it is clearly stated that teacher educators should be able to deal constructively with these circumstances by integrating technologies and media that are available to all participants in transnational collaborations. This third aspect of the competency is analogous to TETC 1, which describes the sub-competency of being able to select relevant technologies for the learning content in question.

Regarding possible theoretical foundations behind the TETC constructs, appendix A of the article by Foulger et al. (2017) provides a useful entry point as it maps the results of the crowdsourced literature review. Of the 43 titles, two publications focus on the construct of global competence in relation to education (Mansilla & Jackson, 2011; Van Roekel, 2010). A policy brief by the NEA states that "global competence is a 21st century imperative." Apart from awareness of global issues, appreciation of cultural diversity, and language proficiency to foster cross-cultural understanding, global competitiveness is also stated as an explicit goal of global competence education (Van Roekel 2010). Boix Mansilla and Jackson (2011) base the need for global competence education on flattened global economies and changing demands of work, as well as increasing cultural diversity due to migration and the need for global stewardship in light of climate change (p. 2f).

DigCompEdu

DigCompEdu does not exclusively address teacher educators; it was developed for "educators at all levels of education" (Redecker, 2017, p. 9) and is situated within the European Education Landscape. The framework comprises of six competency areas, namely "Professional Engagement," "Digital Resources," "Teaching and Learning," "Assessment, Empowering Learners," and "Facilitating Learners' Digital Competence," each including three to five competences. The framework also proposes six competence levels corresponding to the Common Framework of References for Languages (CFRL) (Redecker 2017, p. 9). On the macro level, DigCompEdu distinguishes between educators' professional competencies, educators' pedagogic competencies, and learners' competencies.

Within "Facilitating Learners' Digital Competence," aspect 6.2 relates to digital communication and collaboration. The authors provide 12 examples, one of which explicitly addresses the aspect of culture. According to this example, competent teachers enable learners to "adapt communication strategies to the specific audience and cultural and generational diversity in digital environments" (Redecker, 2017, p. 80).

In the following proficiency-level statements, a similar notion can be found on the third level (corresponding to B1, according to the CFRL):

[…] guide learners in respecting behavioural norms, appropriately selecting communication strategies and channels, and being aware of cultural and social diversity in digital environments (Redecker, 2017, p. 81)

This reference to culture is contextualized in terms of "21st century challenges" that educators can address by teaching "21st century skills" to "21st century learners" (cf. Redecker & Caena, 2019, p. 356). Redecker and Caena refer to the definition of 21st century skills proposed by Binkley et al. (2012), which they paraphrase as

being able to communicate, share, and use information to solve complex problems, in being able to adapt and innovate in response to new demands and changing circumstances, in being able to marshal and expand the power of technology to create new knowledge, and in expanding human capacity and productivity (Binkley et al., 2012, p. 17).

The authors distinguish between a total of 10 skills, each of which falls into one of the following categories: "Ways of Thinking," "Ways of Working," "Tools for Working," and "Living in the World." This last category includes the skills "8. citizenship - global and local," "9. life and career," and "10. personal and social responsibility - including cultural awareness and competence" (Binkley et al., 2012, 18-19).

Digital Capabilities (Jisc)

Developed in 2015 by the UK-based, government-funded organization Jisc, the Digital Capabilities framework addresses various groups in academia including students, researchers, librarians, and teachers in higher education and professional development. It is structured into six dimensions, with ICT proficiency at the core and digital identity and wellbeing framing the other four dimensions. In one of these four dimensions, namely "Digital communication, collaboration and participation"—which comprises the capabilities "Digital communication," "Digital collaboration," and "Digital participation"—two references relevant to intercultural discourse can be found. Digital collaboration is, among other aspects, described as

[the capacity] to work effectively across cultural, social and linguistic boundaries (Jisc, 2014, p. 6) which requires *[a]n understanding of the features of different digital tools for collaboration, and of the varieties of cultural and other norms for working together (ibid.).*

In this framework, culture is addressed on the micro level and as a comparatively isolated phenomenon, as it is only relevant within one aspect of the competency.

Media Didactica

Media Didactica was developed by Belgian researchers in 2014. It consists of three interrelated strands focusing on students and preservice teachers, teachers, and teacher educators respectively. The framework strand for teacher educators distinguishes between three classes of competencies— "Media in teacher education," "Media in the professionalization of the teacher educator," and "Media in the training and education community" (Meeus et al., 2014). Each of these dimensions covers between one and three competence aspects, which are further specified through learning goals and examples (Meeus et al., 2014).

The Media Didactica framework for teacher educators contains one relevant example. In the communication aspect of the third competence dimension, "Media in the training and education community", one of the two learning goals refers to teacher educators' ability "*to use media to build up and maintain an international network*" (Meeus et al., 2014; Appendix, 55).

However, the analyzed material does not contain any reference to a discourse in which intercultural interaction is theoretically grounded.

Discussion

After comparing the frameworks studied, it is clear that the TETCs framework accentuates the aspect of culture most explicitly. Specifically, our analysis shows that the TETCs represent the only media pedagogical competency model for teacher educators that considers culture to be sufficiently important to be further diversified into multiple competence aspects. This framework's comparatively prominent position in media pedagogical discourse offers optimum conditions for establishing links to intercultural competence research. In the case of Media Didactica and Jisc's Digital Capabilities Framework, no theoretical foundation relating to intercultural research could be identified in the analyzed literature, whereas the TETCs and DigCompEdu are informed by the global competence and 21st century skills discourses respectively. In order to discuss the theoretical framing further, a multistage deconstruction process is required (Deardorff, 2006, Bolten, 2014). To this end, the underlying concept of culture must be determined and its situatedness examined in order to counteract a cultural bias or, in this case, an Anglo- or Eurocentric perspective (cf. Dervin et al., 2020).

We follow Bolten's (2014) distinction between a closed (and structurally descriptive) and an open (and process-oriented) concept of culture. The closed concept is characterized by a close link between the constructs of nationality and culture, in which individual cultural identity is characterized by homogeneity and determined by culture. In many research and training contexts, however, structuring culture models still come into play, as they provide orientation, reduce complexity, and ensure measurability (cf. Bolten, 2014). The open concept of culture is characterized as a shared expectation of normality among members of a group (OECD, 2018, Rathje 2009). The national dimension is one of an infinite number of collective constellations that constitute themselves as subcultures or co-cultures (cf. UNESCO 2009). On the macro level, this can be linked to concepts such as global citizenship, which is based on the notion that the world has become a "global village" through globalization and digitalization (UNESCO, 2013), although much smaller communities and clusters (families, interest groups, etc.) can also be seen as cultures (cf. Bolten, 2014). Individuals always have multiple cultural affiliations and act in complex networks. Following an open concept of culture, these interactions between members of different groups may be called intercultural communication. This interaction may take place in a global or a local dimension. A prerequisite for intracultural communication, however, is that the individuals involved encounter difference and thus have to renegotiate their disturbed expectation of normality (cf. UNESCO, 2009, Bolten 2014, Rathje 2009).

Although the TETCs framework gives the most space to the aspect of culture among all the models examined, the construct of culture remains undefined within the framework. To understand this, we need to consider the genesis of the framework. The objectives of a Delphi process are to reach consensus, and the theoretical backgrounds of the participants may be diverse and remain implicit. We can conclude that the consensus reached by TETCs research provides valuable conditions for explicating the construct of culture and exploring possible meanings and underlying assumptions. With the choice of an open or closed concept of culture, the meaning conveyed through TETC 8 changes significantly depending on whether "regions and cultures" is read as "regions and *countries*," which would be the consequence of a closed concept of culture, or is taken to refer to complex clusters of meaning in virtual and physical environments, which would follow from an open and process-oriented conception of culture that emphasizes plurality and fluidity. Even though intercultural scholars stress that normative conceptions of culture are highly dependent on context (Bolten, 2014) and should therefore be neither limited nor fixed (UNESCO, 2009; 2013), research also shows that media shape new communities in which more fluid cultural identities emerge (Chen, 2012).

Conclusion and Outlook

There is plentiful evidence in research and policy on the importance of considering ICT-related and intercultural-global competence development in education together. It has also been shown that teacher educators play a significant role in this process. Looking at relevant teacher educator competence frameworks, we conclude that the TETCs best meet this newly emerging need to address ICT-related competence in a culturally sensitive and potentially global dimension, particularly through TETC 8. In addition, the theoretical foundation of TETC 8 can be clearly traced through the Global Competence Education Framework by Mansilla and Jackson (2011). In view of the highly heterogeneous intercultural research community in disciplinary, conceptual-theoretical, and empirical terms, and especially given the observed bias toward voices from the Global South (Dervin, 2020, Deardorff, 2009), a diverse and international discourse around the TETCs is needed. Designing internationally oriented ICT-enhanced professional development formats for teacher educators based on TETC 8 could make a significant contribution to pluralizing theoretical perspectives on digital intercultural interaction. Further research could thus make a valuable theoretical contribution, while at the same time contributing to the professionalization and internationalization of teacher educators. Recently published studies by Luongo (2019) and Carpenter et al. (2020) on teacher educators' attitudes toward TETCs showed that respondents were significantly more ambivalent toward TETC 8 than toward other TETCs. The authors explain this gap in terms of conceptual uncertainty and a perceived discrepancy between the respondents' own teaching and an international orientation. As a consequence, we conclude that training formats for the TETCs that focus on TETC 8 as a guiding principle and as a lens through which to view the other TETCs have potential for both the internationalization of teacher education as well as the ICT competence development of teacher educators.

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