Interventions for the Initial Education of Secondary School Teachers for Inclusive Education

A Scoping Review of the Literature

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Master in Education: Diversity and Inclusion

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Declaration

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Abstract

This dissertation examines the current landscape of interventions in initial teacher education programs aimed at preparing secondary school teachers for inclusive education. Utilizing a scoping review methodology, it systematically explores literature published after the *General Comment No. 4* on the Convention on the Rights of Persons with Disabilities (2006). The screening and reviewing processes identified seven relevant studies, conducted in the United States (n=4), Spain (n=2), and Australia (n=1), which focused on linguistic (n=3), sex-gender (n=2), or cultural diversity (n=2) and employed diverse methodologies ranging from reflective practices to immersive cultural simulations. Findings suggest that while these interventions increase pre-service teachers' awareness and sensitivity to particular aspects of diversity, they often remain limited in scale and scope. The discussion pointed to the fact that the studies reflect the global trend to adopt a broader understanding of inclusion in education but at the same time fail to move beyond understanding inclusion as a response to marginalized groups and beyond adopting a specified individualized definition. Thus, the studies reviewed also fail to provide evidence for the further development of ITE for inclusive education based on a broad understanding of inclusion, which points to the urgency of investing more research into the matter in order to better prepare teachers for diverse settings.

Summary

There is a global trend in inclusive education to move beyond a narrow definition of inclusion focusing on individuals with disabilities and/or SEN towards a broad understanding which encompasses all learners and a transformation of the educational system. At the same time, secondary school teachers report to feel un- or underprepared for diverse settings and there is little evidence on what such preparation should encompass and how it could effectively be implemented in initial teacher education (ITE).

The primary objectives of the dissertation therefore are to identify, categorize, and analyze existing interventions employed in ITE for secondary school teachers in order to better prepare them for inclusive education. The research aims to answer two core questions:

1. What are the characteristics of interventions employed in initial ISCED level 2 or 3 teacher education to prepare teachers for diverse settings?
2. What kind of evidence does the identified research provide with regards to the further development of ITE programs for said levels regarding inclusive education?

To answer these questions, the dissertation employed a scoping review methodology, which is particularly useful for mapping the breadth and depth of evidence in emerging or diverse fields such as inclusive education and which followed guided by the PRISMA-ScR checklist. The literature search covered four databases: ERIC, British Education Index, Scopus, and Web of Science. The search was restricted to publications in English from 01 October 2016 onward, capturing the most recent developments since the *General Comment No. 4* on the Convention of the Rights of Persons with Disabilities. The review identified seven relevant studies, which were conducted in the United States (n=4), Spain (n=2), and Australia (n=1). The interventions addressed linguistic (n=3), gender (n=2), and cultural diversity (n=2), each with different approaches to teacher preparation.

The findings revealed that all the interventions identified are small in scale and scope, adopting a narrow definition of inclusion. All the interventions target a specific marginalized group other than individuals with disability or special educational needs, which mirrors the broader trend in inclusive education to move beyond these categories. The interventions adopted in the studies varied widely in terms of content, delivery, and focus.

The discussion pointed to the fact that the studies reflect the global trend to adopt a broader understanding of inclusion in education but at the same time fail to move beyond understanding inclusion as a response to marginalized groups and adopting a specified individualized definition. Thus, the studies reviewed also fail to provide evidence for the further development of secondary ITE for inclusive education based on a broad understanding of inclusion pointing to the urgency of investing more research into the matter in order to better prepare teachers for diverse settings.

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Even though the *Master in Education Handbook* defines a dissertation as "the product of the student's **own** experience, reading, and reflection" (School of Education, 2023, p. 35), I could not have completed it without the support of others. First and foremost, I would like to express my gratitude to Geraldine Fitzgerald, the subject librarian for education at the Library of Trinity College Dublin. With her extensive knowledge, skills, and patience, she introduced me to the world of literature reviews, systematized searches of databases, and tools assisting in the review of literature, which is at the heart of this dissertation. Then, I would like to acknowledge the support of my fellow M.Ed. student and dear friend, Oscar Lopes, who was not only willing to meet weekly throughout the whole dissertation process to exchange thoughts and to provide constructive feedback but also provided the emotional support needed during exhaustive periods and in moments, where I was tempted to just give up. Last but certainly not least, I want to thank my beloved wife, Theresa Geuke-Messina, who has acted as an attentive listener, patient counsellor, critical friend, enthusiastic motivator, and my personal save haven in one of the most intense periods of my life. Without her I would not be where I am today.

Table of Contents

List of Tables

List of Figures

List of Abbreviations and Acronyms

CPD	Continuing Professional Development
CRP	Culturally Responsive Pedagogy
CRPD	Convention on the Rights of Persons with Disabilities
ELL	English Language Learner
ERIC	Education Resources Information Center
EU	European Union
EACEA	Educational, Audiovisual and Culture Executive Agency
EASNIE	European Agency for Special Needs and Inclusive Education
GEM	Global Education Monitoring
ISCED	International Standard Classification of Education
ITE	Initial Teacher Education
LGBTIQA+	Lesbian, gay, bisexual, transgender, intersex, queer, asexual, and additional non-heterosexual or non-cisgender identities
OECD	Organization for Economic Cooperation and Development
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
PRISMA-ScR	PRISMA Extension for Scoping Reviews
PST	Pre-service teacher
SEN	Special educational needs
SDG	Sustainable Development Goal
TELLIS	Teaching English Learners Language- and Literacy-Integrated Science
TPL4I	Teacher Professional Learning for Inclusion
UDHR	Universal Declaration of Human Rights
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America

1 Introduction

The concept of inclusive education has undergone significant evolution over the past decades, expanding far beyond its origins of providing educational access to students with disabilities (Haegele & Hodge, 2016). Global policies and policy initiatives of the past 30 years reflect a trend towards adopting a broader understanding of inclusion in education (Opertti et al., 2014). While the United Nations Cultural, Educational and Scientific Organization's (UNESCO) *Salamanca Statement and Framework for Action* (UNESCO, 1994) conceptualized inclusion as a response to learners with disabilities and/or special educational needs (SEN), more recent treaties and policy initiatives such as the Sustainable Development Goals (SDGs; United Nations [UN], 2015) or the European Union's (EU) *Profile for Inclusive Teacher Professional Learning* (De Vroey, Lecheval, et al., 2022) call for a broad conceptualization of inclusion and finding ways of engaging all learners within the regular education system. Despite these developments, implementing inclusive education remains a complex and multifaceted challenge, particularly in secondary education (De Vroey et al., 2015; Pearce & Forlin, 2005; Werning & Arndt, 2013). On the secondary levels of education, a strong subject-focus teaching, rigid curricula, and the transition-oriented structure of secondary schooling create specific barriers to inclusion (De Vroey et al., 2015; Pearce & Forlin, 2005). Teachers often struggle to balance the demands of individualized instruction with the expectation of academic rigor. As classrooms become increasingly diverse (Organization for Economic Co-Operation and Development [OECD], 2019; UNESCO, 2020) and variability is recognized as a natural characteristic within and amongst individuals (Meyer et al., 2014), the need for educators to be adequately prepared to meet the needs of all students becomes more urgent. This is reflected in the report of the *TALIS 2018 Results* (OECD, 2019) where more than 50% of lower secondary school teachers report feeling un- or underprepared for multi-ability, multilingual, and multicultural settings.

A common ground in most of European teachers' careers is a mandatory phase of initial teacher education (ITE; Education, Audiovisual and Culture Executive Agency [EACEA], 2021). ITE, therefore, plays a critical role in preparing teachers for diverse

settings and addressing the specific issues of the educational levels for which they prepare teachers. However, even though the beforementioned *Salamanca Statement* (UNESCO, 1994) already dedicated an entire section to the "Recruitment and Training of Educational Personnel" (pp. 27–29), what has been termed "teacher education for inclusion" (Florian & Camedda, 2020) remains contested as regards to what it should aim for and what components it should encompass. To address this issue, the European Agency for Special Needs and Inclusive Education (EASNIE) developed a value-based *Profile for Inclusive Teacher Professional Learning* (De Vroey, Lecheval, et al., 2022) as part of their *Teacher Professional Learning for Inclusion* (TPL4I) project (EASNIE, 2023). The profile was published to serve as a common framework for the education of teachers in EU member states and the TPL4I project also included a review of the literature which pointed to potential components of teacher education that could contribute to an effective preparation of teachers in line with a broad understanding of inclusion (De Vroey, Symeonidou, et al., 2022). However, neither did the review address the nature of the evidence on which it based its suggestions, nor did it provide specific interventions which could be adopted in ITE. This is also the case in reviews by other authors (Hick et al., 2018; Symeonidou, 2017) and it therefore remains unclear what reliable evidence there is for developing what has been termed "teacher education for inclusion" (Florian & Camedda, 2020).

Therefore, this dissertation seeks to contribute to this evolving discourse by exploring the current state of teacher education for inclusive education at the secondary level of education. Specifically, it examines the nature of interventions designed to prepare pre-service teachers (PSTs) to teach diverse student populations in secondary schools. By conducting a scoping review of the literature, this study aims to identify the characteristics of such interventions, assess the evidence supporting their effectiveness, and offer recommendations for the future development of inclusive teacher education programs. Thus, the two guiding questions are:

1. What are the characteristics of interventions employed in initial ISCED level 2 or 3 teacher education to prepare teachers for diverse settings?

2. What kind of evidence does the identified research provide with regards to the further development of ITE programs for said levels regarding inclusive education?

To answer these questions the dissertation is structured into six chapters. After this first introductory chapter, Chapter 2 contextualizes the research endeavour by examining key developments in and definitional approaches to inclusive education, the role of teachers in and for inclusive education, specific challenges of implementing inclusion on the secondary levels of education, as well as developments in teacher education with regards to inclusion. The third chapter then addresses the methodology adopted to gather evidence relevant to the research questions. It presents the rationale for the research design, the specifics of the scoping review, such as the search strategy and extraction fields, the charting of the data, and the limitations inherent to the methodology. Chapter 4 then presents the results of the scoping review along the main extraction fields before the fifth chapter discusses the findings in light of the context presented in the literature review. Finally, the conclusion of the dissertation aims at presenting an answer to the research questions and implications for future research.

2 Literature Review

The following literature review aims to explore the evolving understanding of inclusion in education, emphasizing the increasing complexity of the concept and the challenges this presents when implementing and developing inclusive education. It addresses the need for teacher preparation for fostering inclusive environments and highlights the unique difficulties encountered at the secondary level of education.

The chapter consists of four main sections. The first section provides an overview of key developments in education and discusses how the concept has expanded from focusing solely on students with disabilities to embracing a wider range of marginalized groups, and further, to calling for a transformation of educational systems. The second section examines the role of teachers in inclusive education and the third section delves into the particular challenges of implementing inclusion in secondary education, where subject-specific teaching and rigid curricula present significant obstacles to individualization and collaboration. The fourth section then shifts to the aspect of teacher education for inclusive educational settings before the last section briefly summarizes the chapter.

2.1 Key Developments in and Conceptualizations of Inclusive Education

When giving an account of the origins and the evolution of the current discourse on inclusive education, much of the literature refers to the UNESCO's Education for All movement launched in 1990. Grounding itself in Article 26 of the Universal Declaration of Human Rights (UDHR; 1948), which proclaimed everyone's right to education, the movement promoted equitable access to quality education for all learners through a variety of conferences and initiatives, ensuring that the development of inclusive education systems was firmly placed on a global agenda by the end of the millennium. In particular, the *Salamanca Statement* (UNESCO, 1994), which resulted from one of the conferences, is often referred to as one of the most important policy initiatives for the establishment of inclusive education as a top priority in countries around the world (Ainscow, 2020; Magnússon, 2019; Opertti et al., 2014). It built on the earlier published

World Declaration on Education for All (UNESCO, 1990) and pointed to "the necessity and urgency of providing education for children, youth and adults with SEN within the regular education system" (UNESCO, 1994, p. viii). Even though the terminology of SEN has been criticized (Demo, 2023; Tomlinson, 2017), the *Salamanca Statement* marked a significant shift in thinking on a global level. By proclaiming that regular schools should accommodate "**all children** [original emphasis] regardless of their physical, intellectual, social, emotional, linguistic or other conditions" (UNESCO, 1994, p. 6), it questioned the common differentiation of education systems into different kinds, types, or tracks for different learners. Furthermore, the *Salamanca Statement* used the term 'inclusion' more explicitly and more extensively than any international policy document before and provided a framework with relevant areas to consider when implementing inclusive education. Its contents and aims were repeatedly reaffirmed by the UNESCO member states in further initiatives such as the *Dakar Statement and Framework for Action* (UNESCO, 2000), the establishment of the *Global Education Monitoring* (GEM) Report (UNESCO, 2002 – today), the Convention on the Rights of Persons with Disabilities (CRPD; 2006), and the articulation of SDG 4 as part of *The 2030 Agenda for Sustainable Development* (UN, 2015). Nevertheless, despite these reoccurring international commitments, there is no conclusive definition to inclusive education that is universally accepted, and the concepts of inclusion and inclusive education therefore remain widely discussed, yet elusive in nature (Banks, 2023).

One the one hand, this has to do with the fact that the concept has evolved over time and, at least on an international level, its scope has broadened (Opertti et al., 2014). On the other hand, the incorporation of international policies, such as the ones previously mentioned, into regional ones and their subsequent enactment is always shaped by the circumstances of a particular region (Magnússon, 2019). While the movement for educational inclusion was mostly driven by the disability rights movement and therefore concerned with finding specific strategies to accommodate learners with disabilities in regular classrooms in the second half of the 20th century (Haegele & Hodge, 2016), the concept has evolved and broadened to encompass a variety of aspects such as access,

quality, equity, diversity, social justice, democracy, and outcome (Ainscow, 2020; Allan & I'Anson, 2014; Bešić, 2020; Hick et al., 2018; Opertti et al., 2014; Seitz et al., 2023). Opertti et al. (2014) differentiate four core ideas which shape these different understandings of inclusion. A first core idea builds on the UDHR and conceptualizes education as a fundamental human right. The second core idea adopts the view that some people have SEN which require a response by the education system. Taking a broader approach to inclusion, the third core idea is that some people and groups are marginalized, and that the education system needs to find ways to respond to all forms of marginalization. While still concerned with specific categories which can lead to exclusion, this third core idea goes beyond disability or SEN as labels. Finally, the fourth and last core idea shaping the understanding of inclusion shifts the focus away from individual learners or groups of learners to the educational systems at large and finding ways of transforming them in such ways that they cater to the natural diversity and variability of human beings. While Opertti et al. (2014) suggest a chronological order of these understandings, they also admit that all the core ideas prevail, sometimes with one or two understandings dominating in a specific context, sometimes with all four of the understandings co-existing. This holds implications for policy, practice, and research alike because the phenomenon under scrutiny will be different depending on the dominating core idea(s).

When it comes to research, an analysis of studies on inclusive education by Göransson & Nilholm (2014) illustrates how different core understandings may result in different definitions of inclusion, which then lead to studies and findings that are clearly distinct from each other even though they all claim to be conducted within the same field of inclusive education. Göransson & Nilholm (2014, p. 268) distinguish four categories of defining inclusion:

(A) Placement definition: Inclusion is concerned with the placement of pupils with disabilities and/or in need of special support in general education classrooms.

(B) Specified individualized definition: The purpose of inclusion is meeting the social and/or academic needs of pupils with disabilities and/or pupils in need of special support.

(C) General individualized definition: Inclusion is aiming at meeting the social and/or academic needs of all pupils.

(D) Community definition: Inclusion is about the creation of communities with specific characteristics.

The short descriptions of the categories indicate that they are shaped by different core ideas on one hand, and that they will shape the respective research endeavours differently on the other hand. While categories (A) and (B) are dominated by the core ideas of some individuals or groups of individuals having SEN or being marginalized, categories (C) and (D) are more likely to build on a human rights-based or systemic approach to inclusive education. While this study builds on a broad understanding of inclusion, the definitional debate also translates into the discussion of what knowledge and skills teachers need to have in inclusive education and of how to prepare them for it.

2.2 Teachers and Inclusive Education

Regardless of the definition employed when talking about inclusive education, the global developments described above alongside national developments (e.g., de Bruin, 2019; Hollenweger, 2014; or Ianes et al., 2020) have had an impact on educational systems and therefore have also affected teachers in a variety of ways. On the one hand, classrooms are perceived to be more diverse across the globe (OECD, 2019; UNESCO, 2020). Students who were previously excluded from education due to disability, gender or other markers of identity are now more likely to have access to education. Moreover, variability within and across individuals is recognized as predictable element in every classroom (Meyer et al., 2014; Rose et al., 2014). This change in classroom composition and perception requires more diverse approaches to teaching, e.g., employing a greater variety of methods and approaching the curriculum more flexibly (Florian & Black-Hawkins, 2011; Meyer et al., 2014). In addition, schools as workplaces have become more diverse beyond the classroom level. Teachers are asked to work more closely with

their colleagues (Weiss et al., 1992), including specialized professionals who have been introduced as a result of what Sally Tomlinson (2017, p. 60) called an "expansion of a SEN industry", and with community members, organisations and professionals outside the school premises (Todd, 2007). Collaboration is regarded as being key for the success of inclusive education and teachers are therefore expected to be open to it (Ainscow, 2020). While data from the OECD's (2019) *TALIS* survey and from the GEM (UNESCO, 2020) indicates that teachers generally show positive attitudes towards inclusion, the same reports also point to a lack of confidence with regards to addressing diversity in the classroom. For example, the *TALIS 2018 Results* (OECD, 2019) show that less than half of the secondary school teachers who participated in the survey felt 'well' or 'very well' prepared for mixed ability settings and less than 40% felt 'well' or 'very well' prepared for teaching in multicultural and multilingual settings (see Figure 1). However, having an exact definition of what knowledge and skills teachers in inclusive settings need to have in order to prevail and successfully teach is not a straight-forward task as various approaches need to be considered.

A first approach is to focus on a specific student characteristic and provide strategies for dealing with it. This approach builds on a rather narrow definition of inclusion and can be illustrated by titles such as *Practical Strategies for Supporting Emotional Regulation in Students with Autism* (Blome, 2018) and *Understanding and Supporting*

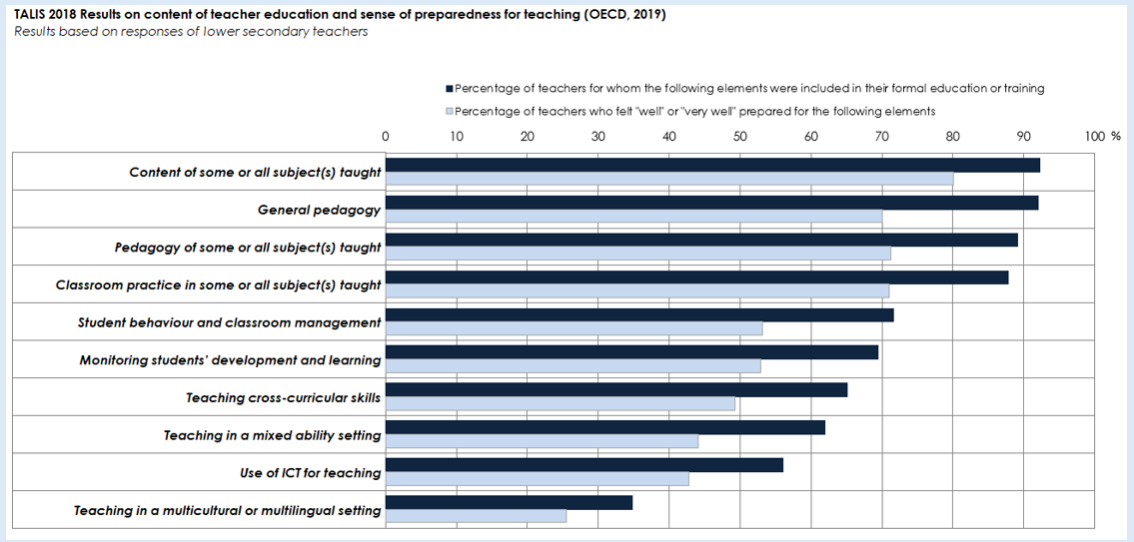

Figure 1: *TALS 2018 Results – Content of teacher education and sense of preparedness (OECD, 2019). Figure based on OECD (2018), Talis Database, Tables I.4.13 and I.4.20.*

Children with ADHD: Strategies for Teachers, Parents and other Professionals (Hughes & Cooper, 2007). While publications taking this approach may provide effective ways of integrating students in the existing education systems and increase teachers' self-confidence, they may at the same time also act as a barrier to inclusion by perpetuating the idea that there is a special body of knowledge and skills needed to teach particular groups of students (Brantlinger, 2005). In a literature review conducted by Norwich & Lewis (2007) to find out what it is that makes teachers feel competent in doing their job, the authors identified four relevant types of knowledge (see Figure 2), the last of which they defined as knowledge on "the nature of the SEN group" (p.141), i.e. knowledge on a group with a specific 'label'. The authors of the studies found that said knowledge acted as a filter to the three other knowledges potentially undermining the three other kinds of knowledge required to feel competent as a teacher (Norwich & Lewis, 2007; Rix & Sheehy, 2014). Consequently, proponents of a second approach therefore stay more general and try to define characteristics of an 'inclusive pedagogy' benefitting all students. For example, based on the findings of a qualitative study in two Scottish schools, Lani Florian and Kristine Black-Hawkins (2011) characterize inclusive pedagogy as "extending what is ordinarily available [in classrooms] to all learners" (p. 814). The approach is underpinned by three key shifts:

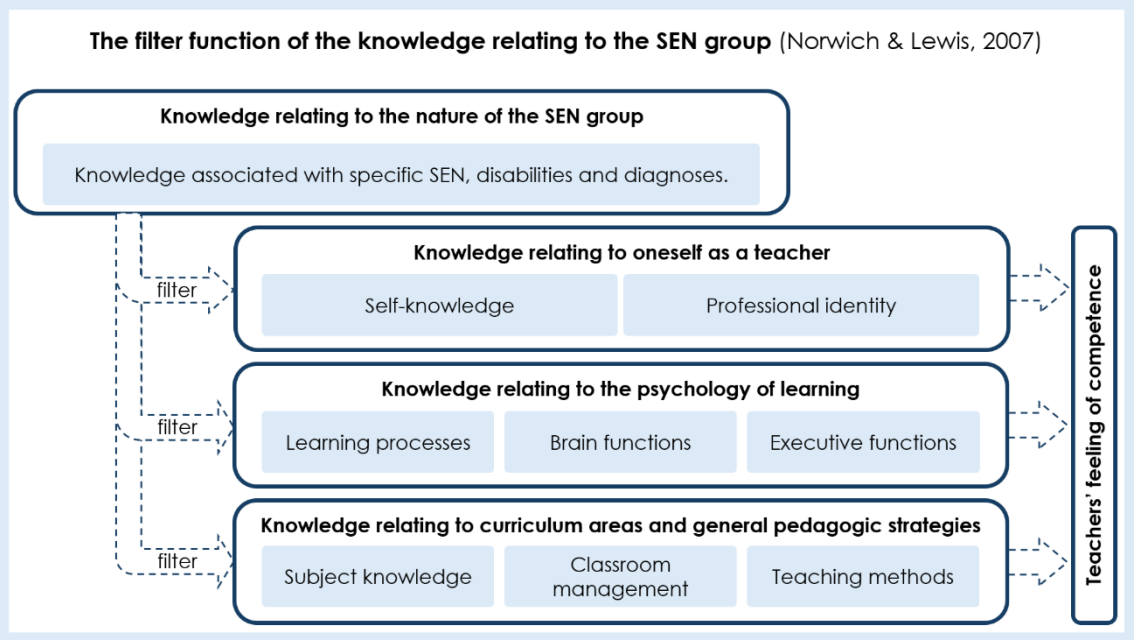

Figure 2: *The filter function of the knowledge relating to the SEN group (based on Norwich & Lewis, 2007, pp. 141-142)*

1. *A shift in focus* away from addressing the needs of only those identified as having 'additional needs' to focusing on the learning of all students within the classroom community.
2. *The rejection of deterministic beliefs about ability*, i.e. challenging the traditional belief that ability is fixed, and that the presence of some students might hinder the progress of others, and, instead, promoting the belief that all students can make progress and achieve success.
3. *Viewing learning challenges as professional opportunities* for educators to develop more innovative and inclusive teaching strategies.

While Florian & Black-Hawkins (2011) present inclusive pedagogy as a distinctive concept and talk about shifts, other authors argue that there is nothing special to inclusive pedagogy. For example, Rix & Sheehy (2014) reviewed studies comparing 'regular' and 'inclusive' pedagogy and concluded that there is no distinctively different inclusive pedagogy. Instead, they found that the core principles of inclusive pedagogies align with those in mainstream education. Specific approaches such as *Universal Design for Learning* (Meyer et al., 2014; Rose et al., 2014) or the *Multi-Tiered System of Support* (Cologon & Lassig, 2020; de Bruin, 2023) build on long standing pedagogical theories; teachers regarded as being inclusive simply tend to place more emphasis on explicit instruction and employ a wider range of methods in comparison to their colleagues Rix & Sheehy, 2014).

Building on this, the TPL4I project by the EASNIE (2023) integrates these perspectives, synthesizing research and policies to outline key competencies for teachers in inclusive education, thus merging targeted strategies with a broader, inclusive pedagogical framework. As a result of the project, EASNIE published the value-based *Profile for Inclusive Teacher Professional Learning* (De Vroey, Lecheval, et al., 2022). Combining the two approaches discussed in the previous paragraph, the profile defines four key areas:

1. *Valuing learner diversity* as the foundation of inclusive education: Teachers must recognize and appreciate the diverse backgrounds, abilities, and learning styles

of their students. This involves developing an inclusive mindset, where diversity is seen as an asset rather than a challenge.

2. *Supporting all learners*: Teachers need to develop the skills to differentiate instruction and adapt their teaching methods to meet the individual needs of each student. This includes understanding the various learning difficulties and disabilities that students may have and being able to implement strategies that accommodate these needs as well as effective classroom management that fosters a positive and supportive learning environment.
3. *Working with others*: Teachers are encouraged to collaborate with colleagues, including special educators and other professionals, to provide comprehensive support for students. This collaboration extends to working with parents and the wider community to ensure that students receive the necessary support both inside and outside the classroom.
4. *Personal and collaborative professional development*: Teachers are encouraged to engage in continuous learning, both individually and in collaboration with others, to stay updated on the latest research, tools, and strategies in inclusive education. Professional development should be an ongoing process, embedded in a supportive school culture so that teachers can refine their skills and enhance their effectiveness in creating inclusive classrooms.

As an official policy document published by an agency of the EU, the profile is of great importance for the implementation of inclusive education in Europe. However, the translation of the profile into practice has only just begun and is faced with challenges on various levels of the education systems and in the education of teachers (Hick et al., 2018, 2019).

2.3 Inclusion at the Secondary Level of Education

As indicated by the earlier mentioned responses of lower secondary school teachers in the TALIS 2018 survey (OECD, 2019), implementing inclusive education appears to pose a particular challenge on the secondary level of education, i.e. levels 2 and 3 according to the International Standard Classification of Education (ISCED; OECD et al., 2015). Annet De Vroey and her colleagues (2015) summarize the situation as follows: "Secondary education represents both an interesting and a challenging context for inclusive school development" (p. 111). The challenges mostly arise from the inherent structure of ISCED levels 2 and 3, which are characterized by a subject-oriented focus of the curriculum and their "transition function towards higher education or the labour market" (De Vroey et al., 2015, p. 111). Both characteristics have several practical consequences which impede the implementation of inclusion.

The subject-focus can make it difficult to create the flexibility required to meet the needs of all learners and finding time for teachers to collaborate with others. Because a greater number of teachers are involved in teaching a course, timetabling is often strict, and teachers may feel pressured to focus on covering the curriculum leaving little room for individualized instruction or the adaptation of teaching methods to accommodate students with SEN. Moreover, the subject-focus has an impact on the understanding of the role as a teacher. Many secondary school teachers are trained as subject specialists and may lack the necessary training in inclusive education practices (De Vroey et al., 2015; Pearce & Forlin, 2005). De Vroey et al. (2015) suggest that this type of training correlates with more fixed views about ability and adherence to a medical model of disability. In addition to the challenges brought by a subject-focus, the transition function of secondary education favours selection mechanisms such as tracking or standardized tests. Combined with a high accountability of teachers (Cochran-Smith & Villegas, 2016), this emphasis not only conflicts with the flexibility required to effectively implement inclusion, but also puts pressure on teachers to focus on content-delivery according to a rigid curriculum rather than individualizing it (De Vroey et al., 2015; Pearce & Forlin, 2005; Werning & Arndt, 2013). While some of these challenges need to be addressed on a

systemic level, others might be addressed during the education of secondary school teachers.

2.4 Teacher Education and Inclusion

According to a 2021 *Eurydice Report* by the EACEA, teacher education for secondary school teachers in Europe is generally organized through a combination of ITE and induction programs (EACEA, 2021). ITE for secondary school teachers usually leads to a master's degree in most European countries, combining subject knowledge, pedagogical training, and classroom practice. The structure of ITE varies between concurrent and consecutive models:

> "Concurrent programmes are dedicated to ITE from their start, with general academic subjects provided alongside professional subjects. Consecutive models cover programmes where students, who have undertaken higher education in particular fields, move on to professional teacher training in a separate successive phase" (EACEA, p. 62).

Thereby, the professional training components can differ in duration across countries. Following ITE, structured induction programs, which are often mandatory, support newly qualified teachers, helping them transition into the profession. These programs typically include mentoring and professional development activities. Continuing Professional Development (CPD) is a third phase of teacher education which is highly relevant for the development of inclusive education (De Vroey, Symeonidou, et al., 2022; Forlin, 2010). However, the participation in CPD opportunities is often less strictly regulated than the ITE and induction phases and depends on the individual teacher's motivation to participate in such opportunities or not (De Vroey, Symeonidou, et al., 2022; EACEA, 2021). Thus, when looking for ways of equipping teachers with the relevant skills and knowledge for inclusive education, ITE programs are a unique opportunity to reach as many (future) teachers as possible. However, teachers report that topics relating to inclusive education are amongst the least addressed during ITE (OECD, 2019) and reviews of programs, research

literature and policy documents identify major gaps in preparing teachers for inclusive education.

For example, a review of ITE programs in the Republic of Ireland by Hick et al. (2018, 2019) found that teacher education programs often lack comprehensive training in inclusive practices, with significant variability in curriculum content across institutions. They further found that newly qualified teachers often reported feeling underprepared in certain aspects of inclusive teaching, particularly struggling with managing challenging behaviors, meeting the time demands required for differentiation, collaborating effectively with Special Needs Assistants, engaging with external professionals, and working alongside parents. Hick et al. (2018, 2019) emphasized the need for standardized inclusion training and CPD to prepare teachers effectively for inclusive education. At the same time, they also pointed to the fact that teacher educators need more opportunities to develop their competencies. These findings correspond to those of a review of research literature by Simoni Symeonidou (Symeonidou, 2017). In her review, she highlighted critical gaps in ITE, such as insufficient emphasis on diversity and limited exposure to inclusive pedagogies. She advocated for embedding inclusion throughout teacher education programs rather than treating it as an add-on and emphasized the importance of collaboration between general and special education departments. Finally, a review of research literature and policy documents conducted as part of the TPL4I project (De Vroey, Symeonidou, et al., 2022) criticized the fragmentation of teacher education, i.e. a disconnect between theory and practice, the perpetuation of deficit views of difference, and lacking expertise of teacher educators in engaging with diversity. All three reviews converge on the importance of ongoing, context-specific training that enables teachers to adapt to the diverse needs of their students. Furthermore, they all stress the need for practical, hands-on experiences in teacher education programs, arguing that such experiences are essential for developing the skills necessary for inclusive teaching. At the same time, none of the reviews provides an explicit overview of effective strategies or practices which can be included in teacher education, which is a gap that this research hopes to address.

2.5 Summary of the Chapter

The previous sections highlighted how the concept of inclusion in education has broadened over time, moving beyond merely accommodating students with disabilities to addressing a wider range of marginalized groups to recognizing variability and diversity as natural characteristics of humanity. On an international level, this evolution is pushed by major bodies such as the UN and the EU. Though in a diversity of ways, these international developments have also translated into national contexts, reflecting an expanded focus on equity, diversity, and social justice within education systems. However, this shift also underscores the need for teachers to be better prepared to engage with diverse student populations. The chapter further showed that the implementation of inclusive education becomes particularly challenging at the secondary levels of education. The subject-specific focus and rigid curriculum structures of secondary education create barriers to flexibility, collaboration, and differentiation, making it difficult to address the individual needs of students. Additionally, secondary school teachers are often trained as subject specialists, which may limit their preparedness for inclusive teaching practices. Therefore, it is particularly important to identify and eventually implement effective ways of preparing PSTs for diverse classrooms, which is the focus of this study.

3 Methodology

The previous chapter showed that the concept of inclusion is elusive. The definition adopted not only affects its implementation in policy and practice but also research endeavours and the results they produce. Moreover, research on how to prepare secondary-level teachers for inclusive and diverse settings is relatively young, particularly if employing a broad conceptualization of inclusion. Research, such as the one presented in this dissertation, that adopts a social-constructivist point of view must also account for the ways in which inclusive education and teacher education is constructed. In order to answer the research questions, it was therefore necessary to choose a design which would allow to identify the depth and breath of the currently existing evidence allowing the mapping of this research in regard to the conceptualization of inclusion, the approach employed, and the results produced. I therefore chose to conduct a scoping review of the literature as described by Peters et al. (2015) as well as Munn et al. (2018). Scoping reviews are particularly useful to "identify the types of available evidence in a given field, [t]o clarify key concepts / definitions in the literature [and t]o examine how research is conducted on a certain topic or field" (Munn et al., 2018, p. 2). In order to ensure transparency and replicability, the reporting of the scoping review of the literature follows the *PRISMA Extension for Scoping Reviews* (PRISMA-ScR) checklist which encompasses 20 core and two optional items (Tricco et al., 2018, see Appendix). The checklist is based on the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) statement that has roots in the medical sciences and aims to ensure that systematic reviews are comprehensive, transparent, and reproducible (Page et al., 2021). The checklist is meant to help in structuring the review process, from the literature search to the presentation of results, and therefore also informs the structure of this chapter.

The first section presents the research questions and objectives thereby laying the ground for Section 3.2 which further details the research design and the rationale behind it. The third section then provides an account of the search strategy and the selection of the literature. The section includes an overview on the databases, specifies the search

terms, details the search of the databases, and discusses the screening process including the eligibility criteria. In line with the chronological order of this study's components, Section 3.4 then addresses the charting of the data. A brief discussion of the limitations is presented in Section 3.5 before the last section summarizes the chapter.

3.1 Research Question and Objectives

As shown in Chapter 2, the developments in education with regards to inclusion combined with teachers reporting feeling ill-prepared for diverse classrooms require education systems to find ways of adequately and effectively preparing teachers for their work in inclusive settings. This need is of special importance for ISCED levels 2 and 3 where the development of inclusive education has been shown to be particularly challenging (De Vroey et al., 2015; Pearce & Forlin, 2005; Werning & Arndt, 2013). Furthermore, such preparation should expand its scope beyond equipping teachers with specific strategies for dealing with specific disabilities and SEN because of the general tendency towards adopting a broad understanding of inclusion in policy-making and initiatives in education (see e.g., De Vroey, Lecheval, et al., 2022; Opertti et al., 2014; or UNESCO, 2020). A possible point in time in most of the teachers' careers to include such preparation is the ITE period before they enter service. While previous reviews pointed to the lack of adequate training for inclusive education during ITE and suggested potential adaptions to the curriculum (De Vroey, Symeonidou, et al., 2022; Hick et al., 2018; Symeonidou, 2017), none of them provided specific evidence for said adaptions. In fact, it remains unclear if there is evidence at all which could serve as reference when developing interventions to prepare teachers for inclusive education in a broad sense. Thus, the current study set out to identify and compile interventions employed during ITE for secondary school teachers which have been researched with the aim of preparing teachers for diverse educational settings. The two guiding questions for this dissertation are as follows:

1. What are the characteristics of interventions employed in initial ISCED level 2 or 3 teacher education to prepare teachers for diverse settings?

2. What kind of evidence does the identified research provide with regards to the further development of ITE programs for said levels regarding inclusive education?

The main objectives of the scoping review therefore are (1) to identify interventions that have been conducted during ISCED level 2 or 3 teacher education to prepare teachers for diverse settings; (2) to identify key characteristics of these interventions with regards to the definitional aspects according to Göransson & Nilholm (2014) and Opertti et al. (2014), their context, and their design; (3) to analyse the evidence the studies provide; and (4) compile evidence-based interventions for secondary teacher education for inclusion. In order to answer these questions and meet the objectives, a scoping review of the literature was conducted.

3.2 Research Design

Scoping reviews of literature are used for mapping the breadth and depth of research on a given topic (Peters et al. (2015). Unlike systematic reviews, which focus on narrow research questions often related to the effectiveness of an intervention, diagnostic test, or treatment (Munn et al., 2018), scoping reviews aim to explore all relevant literature to provide an overview of the available evidence. As a result, this makes them particularly useful in fields where research is emerging, diverse, or scattered, which is the case in the field of inclusive education in general and the area of teacher education for diverse settings in particular. As shown in the previous chapter, the elusive nature of inclusion has led to a diversity of approaches in terms of research and implementation and the idea of teacher education for inclusion based on a broad definition of inclusion is relatively young. Furthermore, Chapter 2 also highlighted how previous reviews concerned with teacher education for inclusion (De Vroey, Symeonidou, et al., 2022; Hick et al., 2018; Symeonidou, 2017) lack an explicit focus on interventions and on the secondary level of education. Conducting a scoping review will allow for the mapping of existing literature on secondary teacher education for inclusion, the identification of key concepts, theories, sources, and types of evidence, and clarification of areas where more research

is needed (Munn et al., 2018; Peters et al., 2015). Finally, conducting a scoping review aligns with the social-constructivist belief that knowledge is constructed through social processes and interactions (Creswell & Creswell, 2018) because it allows for exploration of how concepts and phenomena related to inclusive education are interpreted and understood by different researchers. The research design therefore facilitates the identification and mapping of diverse perspectives, highlighting how different social and cultural backgrounds influence the understanding of the phenomenon at hand. In order to ensure transparency and reproducibility, the reporting of the review follows the 20 core items of the PRISMA-ScR checklist (Tricco et al., 2018, see Appendix).

3.3 Search Strategy and Selection of Literature

The core of the scoping review of the literature is the identification of relevant publications on relevant databases by systematically searching them with relevant terms (Machi & McEvoy, 2016). To make the procedure transparent and accessible, this section addresses the choice of databases, the definition of relevant search terms, and the specific searching procedure adopted, which is of particular importance in context of this study as there is no review protocol registered elsewhere (Tricco et al., 2018). The final part of the section will then address the screening procedure and the eligibility criteria.

3.3.1 Databases

In total, four online databases were searched for relevant literature, two of which were subject-specific and two of which were multi-disciplinary databases. As subject specific databases, the *Education Resources Information Center* (ERIC) and the *British Education Index* both index journals, research reports, conference papers, and other materials including grey literature focused on education research (EBSCO Publishing, n.d.; ERIC, n.d.; Strayer, 2008). ERIC was chosen because it is the biggest educational database (Strayer, 2008) and the British Education Index because the area of SEN, which is associated and intertwined with the area of inclusive education, is listed as particular strength (EBSCO Publishing, n.d.; The Library of Trinity College Dublin, 2024). Both

databases were accessed via EBSCOhost Research Platform (*www.ebscohost.com*). Given that the concept of inclusion is also of interest for other disciplines, two multi-disciplinary databases were searched in addition to the subject-specific ones. They are the *Scopus* database (*www.scopus.com*) and the *Web of Science Core Collection* (*www.webofscience.com*). Both databases cover a wide range of disciplines, including but not solely focussing on education, and index peer reviewed publications only. Furthermore, they have both been used by previous reviews in the field of inclusive education producing relevant literature (e.g., De Vroey, Symeonidou, et al., 2022; Jurado de los Santos et al., 2020; or Symeonidou, 2017).

3.3.2 Search Terms

The databases were searched with specific search terms corresponding to the key concepts contained in the research question and objectives. The first step of developing effective search terms was a thorough engagement with the literature specific to the areas of inclusive education, teacher education, and levels of education to ensure that all the relevant subject-specific concepts and terminology were identified (Machi & McEvoy, 2016). In total, there are four concepts that are crucial for answering the research question, i.e. inclusion (in education), secondary education, ITE, and intervention. The first three are particularly complex and relate to or encompass other terms and concepts which had to be considered in defining the search terms. Inclusion, for example, is closely linked to diversity, variability, and equity, and studies concerned with secondary education could also use the terms post-primary, middle school or high school education. After drafting potential search terms and testing them on the databases, they were further discussed and refined with an expert, in this case the Subject Librarian for Education of the Library of Trinity College Dublin, to ensure that they would work on all the databases and that the conventions were correctly employed. Finally, the terms for each concept were translated into term strings utilizing Boolean operators (see Table 1).

Table 1: *Overview of the term strings created for each concept.*

Concept	Term strings
(1) Inclusion / Inclusive Education	inclus* OR integ* OR divers* OR equit* OR equal* OR variab*
(2) Secondary Education	"secondary education" OR "secondary school*" OR "isced level 2" OR "isced level 3" OR "middle school*" OR "high school*" OR "post primary education" OR "postprimary education" OR "postprimary school*" OR "post primary school*" OR "post-primary education" OR "post-primary school*"
(3) Initial Teacher Education	"initial teacher education" OR "initial teacher training*" OR "initial teacher preparation*" OR ite OR "pre service teacher education" OR "pre service teacher preparation*" OR "pre service teacher training*" OR "preservice teacher education" OR "preservice teacher training*" OR "preservice teacher preparation*" OR "pre-service teacher education" OR "pre-service teacher training*" OR "pre-service teacher preparation*" OR "teacher education" OR "teacher training*" OR "teacher preparation*"
(4) Intervention	"intervention*" OR "evidence based" OR "evidence-based"

3.3.3 Searching the Databases

Regardless of the database, the search was based on six basic steps. In steps one to four, titles and abstracts were searched for each of the concepts individually by applying the term strings. In a fifth step, the results of the individual searches were combined using the Boolean operator AND to reduce the results to only those publications which addressed all the concepts. In a last step, the searches were limited to include only literature in English and published from 01 October 2016 onward. The date was chosen because it is the month after the publication of *General comment No. 4* on the CRPD (UN, 2016), which clarified on a global level that educational inclusion had to mean the accommodation of all students in regular schools. Thereby, the directive can be expected to not only push policymaking but also research to find ways of effectively including all students and preparing teachers to do so. There were no further limitations applied. The results from ERIC and the British Education Index could therefore also include grey literature such as theses or government reports. These steps were then adopted to the specifics of the databases as follows:

- On ERIC and the British Education Index, there was one additional step per concept added because they offer a thesaurus, which can be searched for 'subject terms.' They relate to the content of a publication and are added by the

provider as tags to publications with similar contents. Therefore, when searching these two databases during this study, the thesaurus was checked for subject terms corresponding to each of the terms in the concept-specific term string. The subject terms were then used for one additional search per concept and the results were added to the other results of that concept (see Figure 4).

- The Web of Science Core Collection does not offer a thesaurus but instead indexes the publications with a topic. Said field is automatically also considered when searching titles and abstracts.
- Finally, the Scopus database does not allow for conducting individual searches one after another and combining them in the end. The searches of titles and abstracts for each concept therefore had to be conducted and combined within one step, putting the term strings in parentheses and linking them with AND.

As an example, Figure 4 (p. 23) provides illustrates the search process for ERIC. All the databases were last searched on 13 September 2024. The results were exported as one RIS file per database so that they could be later uploaded to *Covidence*, the tool used for the primary screening and data extraction process.

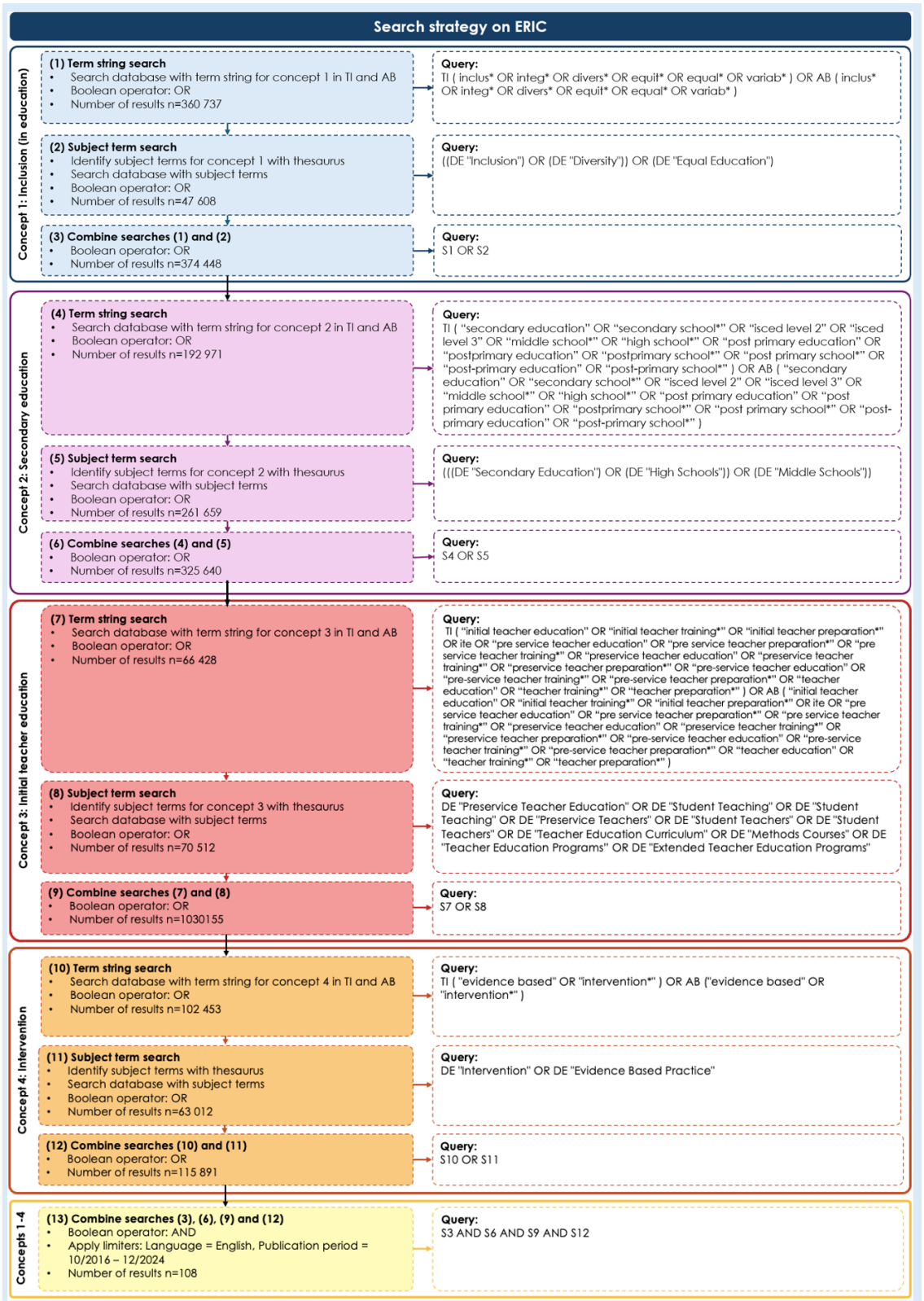

Figure 3: *Flow chart illustrating the search process on ERIC.*

3.3.4 Screening and Eligibility Criteria

To facilitate the primary screening and data extraction processes, the RIS files were uploaded to *Covidence* (*www.covidence.org*). A total of 296 studies were imported for screening, 73 of which were identified as duplicates and removed either automatically (n=66) or manually (n=7). In a second step, titles and abstracts were screened for eligibility. To be eligible for the review …

- … the publication had to include an intervention, i.e. a specific action or program intentionally designed to change student teachers' attitudes, self-efficacy beliefs, knowledge or behaviour.
- … the intervention had to be conducted within an ITE program for ISCED level 2 or 3 teachers.
- … the intervention's purpose had to be to (better) prepare student teachers for (aspects of) inclusive education.
- … the publication had to include information about the effectiveness of the information. However, the effects do not have to be statistical measures.
- … the publication had to be published form 01 October 2016 onward.

The screening of titles and abstracts led to the exclusion of another 185 articles. The remaining studies (n=38) were sought for retrieval and the ones successfully retrieved (n=37) were assessed for the eligibility criteria. Excluded were studies lacking an intervention (n=8); targeting in-service teachers, teachers from other ISCED levels or other professionals (n=17); not explicitly relating to inclusive education (n=1); and studies that were published before October 2016 (n=1). Moreover, review articles were also excluded (n=2) but checked for studies which might be eligible for inclusion in the final sample before removal (n=0). Other than that, the criteria were kept relatively loose to allow for capturing the breath of studies conducted in the area of secondary teacher education

for inclusive education. The identification and screening processes resulted in a total of eight studies to be included in the review (see Figure 5).

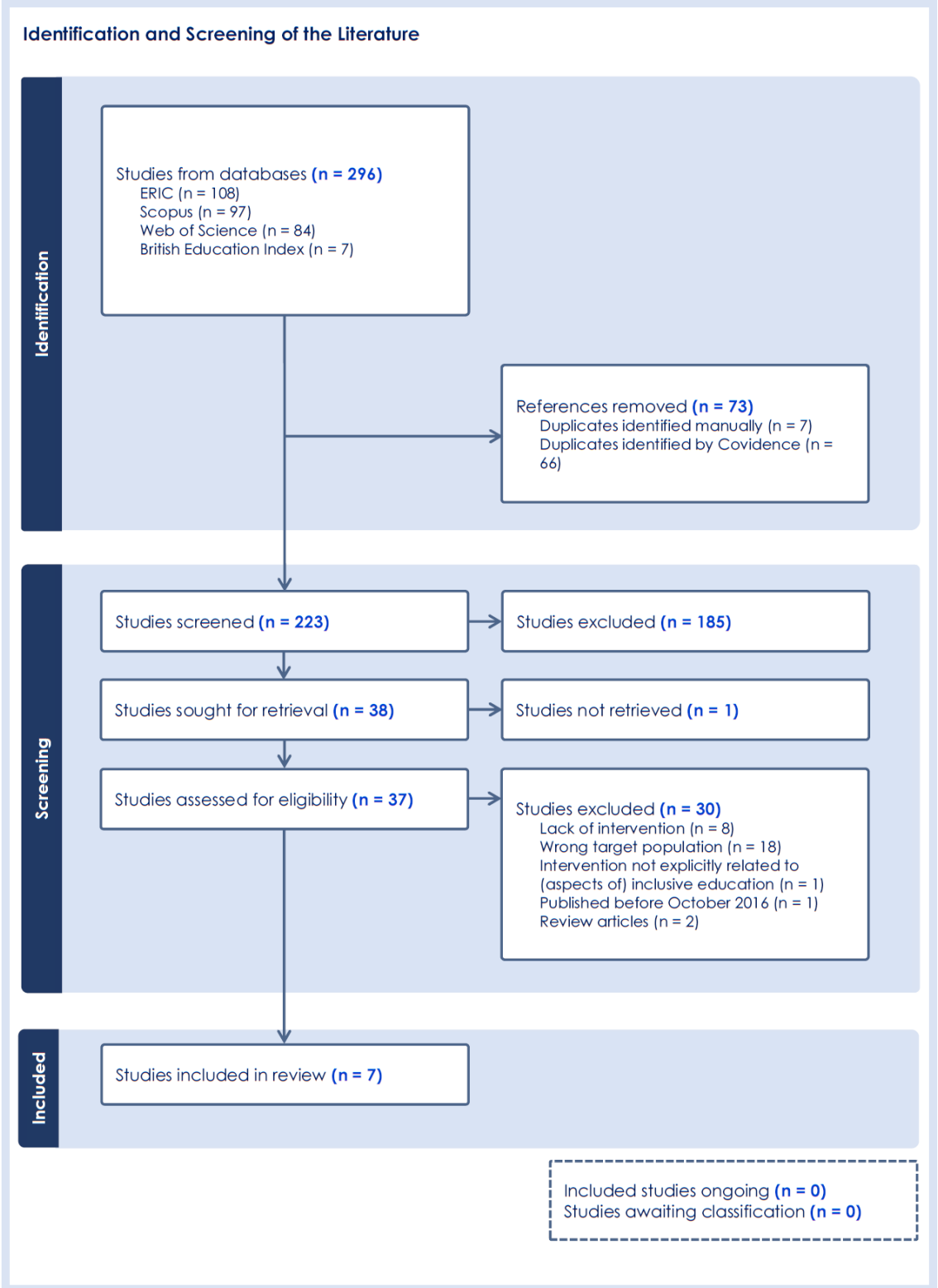

Figure 4: *Flow chart illustrating the identification and screening process (based on the template provided by Covidence).*

3.4 Charting the Data

The process of charting the data aims at logically and descriptively summarizing the results of the review and should align to the research questions and objectives (Peters et al., 2015). Therefore, before the actual review, a charting table was created and relevant extraction fields, i.e. the components for which each study will be searched and which will be presented and discussed to answer the research questions, were defined (see Table 2). A first group of extraction fields, categorized as 'identifiers', was deemed relevant for the correct identification of the publication. A second group provides information on the context of the study and the intervention, covering aspects such as the country of origin, the model of ITE, the subject focus, and the student population. This group is relevant for understanding the setting in which the intervention was employed and how it might be transferred into or adapted for other programs. Furthermore, three extraction fields were selected for capturing how each study conceptualizes inclusion, and seven for capturing the methodology of the study and the characteristics of the interventions. Fields in this category are relevant for answering the two guiding questions, i.e. gaining an understanding of how interventions in ITE for inclusive education are conducted, and what evidence base they provide. Finally, two extraction fields are concerned with the specific findings of each study and its limitations, which are necessary to assess the interventions' scope and relevance.

Table 2: Overview on the extraction fields for the review.

Extraction fields
Identifiers
• Author(s) • Year of publication
Context
• Country of origin • Model of ITE • If applicable: Subject focus • Student population
Understanding of inclusion
• Definitional category according to Göransson & Nilholm (2014) • Underlying core idea(s) according to Opertti et al. (2014) • If applicable: Marker of (learner) identity focused
Methodology and intervention characteristics
• Type of Study • Aim(s) and objective(s) of the study • Target population • Sample size • Components of the intervention • Duration of the intervention • Measuring the outcomes
Findings and limitations
• Key findings with regards to the review questions • Limitations

3.5 Limitations of the Methodology

The methodology described in this chapter has several key limitations. First, the context of this study, i.e. it being a master's dissertation with clear guidelines, did not allow for more than one reviewer. This could raise concerns about transparency and potential bias in the review process. However, to reduce that risk, multiple meetings with a Subject Librarian from Trinity College Dublin were held to discuss the search strategy and reflect on the process. Furthermore, the PRISM-ScR checklist was strictly followed, and this methodology section is extensively describing the process to enhance transparency.

Second, said search strategy was limited to English-language publications, which introduces a language bias and potentially excludes relevant studies published in other language, a limitation which could not be addressed. Third, the chosen period inevitably leads to earlier publications being excluded from the review. Due to the findings of earlier reviews (De Vroey, Symeonidou, et al., 2022; Hick et al., 2018; Symeonidou, 2017) and an analysis of the studies they included and their references, the risk to miss relevant studies was assessed to be small. Lastly, the inclusion criteria were relatively broad to capture a wide range of interventions, which may lead to considerable variety in the included studies, making it more difficult to compare and synthesize findings effectively. To mitigate this limitation, the extraction fields were chosen to focus characteristics expected to be available for all studies.

3.6 Summary of the Chapter

In conclusion, the previous sections outlined the comprehensive approach adopted to address the research questions on preparing secondary teachers for inclusive education during their ITE. A scoping review, as defined by Peters et al. (2015) and Munn et al. (2018), was selected due to its capacity to map diverse evidence, identify key concepts, and provide a broad overview of the field. The systematized search of four databases, combined with a transparent process adhering to the PRISMA-ScR checklist, ensures the replicability and reliability of the findings. The search strategy, data charting, and selection criteria were carefully aligned with the research objectives, leading to the identification of seven relevant studies which are presented in the next chapter.

4 Results

The searching and screening procedures resulted in a total of seven studies eligible for the scoping review. All of them were published in or after 2019 and conducted in one of three countries; the United States of America (USA; n=4), Spain (n=2) or Australia (n=1). The key information on each study that was extracted in order to answer the research questions is displayed in Table 3 and Table 4. Even though the total number of studies under review was small, they covered a variety of interventions, definitional aspects, and methodologies. The following sections therefore provide more detail for each study. The broad structure of the chapter thereby follows the extraction fields as they were presented in Section 3.4. The first section addresses the context of the studies, the second provides insight on the conceptualizations of inclusion in each study, the third presents the interventions employed, and the fourth section explicates the methodologies adopted to measure the effects of the interventions. The fifth section will then list the main findings from each study before a final section summarizes the chapter.

4.1 Context of the Studies

With regards to the wider context, the data on the region, the model of ITE, and the target population of the study were extracted. Table 3 reveals that four of the studies were conducted in the USA, two in Spain, and one in Australia. The table further indicates that four studies were conducted in a consecutive model of teacher education and most of the students were enrolled in mathematics or science pathways. In order to better understand the context, the relevant extraction fields shall be discussed in more detail.

While Rutt & Mumba (2020; 2022) conducted both their studies "at a large research university in the mid-Atlantic of the United States" (Rutt & Mumba, 2020, p. 850), Rebecca Dibbs and her colleagues (2023) employed their intervention at a research university in Texas which they described as "midsized, rural Hispanic-serving research university in the South with approximately 11,000 students" (p. 12). They further pointed to the composition of the student body and identified 40.6% of the students as non-White and

Table 3: *Contextual characteristics and conceptualization of inclusion of the studies.*

Study	Country	Model of ITE	Subject focus	Understanding of inclusion		
				Definitional category according to Göransson & Nilholm (2014)	Core idea(s) according to Opertti et al. (2014)	Marker of identity focused by study
I (2019)	USA	Concurrent	Mathematics	Specified individualised definition	Inclusion as response to marginalized groups	Linguistic diversity: ELLs
Rutt & Mumba (2020)	USA	Consecutive	Science: • Biology (n=7) • Earth Science (n=2) • Chemistry (n=1) • Engineering (n=1)	Specified individualised definition	Inclusion as response to marginalized groups	Linguistic diversity: ELLs
Rutt & Mumba (2022)	USA	Consecutive	Science: • Biology (n=2) • Earth Science (n=1)	Specified individualised definition	Inclusion as response to marginalized groups	Linguistic diversity: ELLs
Dibbs et al. (2023)	USA	Concurrent	Mathematics	Specified individualised definition	Inclusion as response to marginalized groups	Cultural diversity: not further specified
Ortega-Sánchez & Barba-Alonso (2023)	Spain	Consecutive	Social Sciences	Specified individualised definition	Inclusion as response to marginalized groups	Sex-gender diversity: not further specified
Paige et al. (2024)	Australia	Concurrent	Mathematics and/or Science	Specified individualised definition	Inclusion as response to marginalized groups	Cultural diversity, i.e. Aboriginal and Torres Strait Island culture
Cantos et al. (2024)	Spain	Consecutive	Not specified	Specified individualised definition	Inclusion as response to marginalized groups	Sex-gender diversity: LGBTIQ+

Table 4: *Information on the interventions, evidence, and findings of the studies.*

Study	Type of study	Sample size	Intervention	Data collected	Key findings
I (2019)	Qualitative	2	• Five cycles: o Inputs on topics related to ELLs and language-integrated methods o Application in a 1:1 setting o Guided reflection	• Written lesson plans, instructional materials, and written reflections • Video recordings of the 1:1 lessons • Interviews	• PSTs task modification changed significantly throughout the intervention • PSTs prior knowledge affected the nature and the extent to which they modified tasks
Rutt & Mumba (2020)	Qualitative	11	• Two consecutive science methods courses o Explicit introduction of TELLIS model (Rutt & Mumba, 2020) and modelling of TELLIS strategies o Reflection on course sessions • Planning lessons with TELLIS in mind, two of which were taught and reflected on during placements	• Answers to open-ended pre-intervention survey questions • Lesson plans, instructional materials, and written reflections • One semi-structured interview per participant	• Number of students integrating TELLIS instructional strategies increased • Number of TELLIS instructional strategies integrated increased • Strategies focused integration of small group and partner discourse, opportunities for authentic language use, and variety of support for understanding and use of language
Rutt & Mumba (2022)	Mixed-methods	3	• Identical with the intervention described for Rutt & Mumba (2020) as the three participants were recruited from their sample	• Answers to open-ended pre-intervention survey questions • Lesson plans, instructional materials, video recording of the lessons, and written reflections • Two semi-structured interview per participant • One semi-structured interview with the participants' mentor teacher	• Most TELLIS strategies were successfully enacted at least once during the units • Enactment mostly occurred at a basic level • Participants supported learners' language use less frequently than understanding • Only one participant integrated learner's home-language
Dibbs et al. (2023)	Qualitative	12	• Cultural simulation training exercise, i.e. Bafa Bafa, during one seminar session (90 minutes) • Individual reading of two articles related to CRP • Reflection paper to be written individually	• Notes on a debriefing discussion • Post-activity reflection papers • Interview at the end of the semester	• Bafaf Bafa served as a catalyst for change in participants' cultural responsiveness
Ortega-Sánchez & Barba-Alonso (2023)	Quantitative	19	• Four seminar sessions (2.5 hrs each): o Short thematic blocks followed by practical group activities o Engagement with science popularization publications on social networks	• Answers to 'Epistemology, methodology and gender in taught history (EGM)'-questionnaire (Ortega-Sánchez & Heras-Sevilla, 2020)	• The intervention led to an increase of the participants' historical awareness skills
Paige et al. (2024)	Mixed-methods	Pre: 28 Post: 15	• Multiple initiatives integrated in course: o Watching and discussing documentaries o Guest lectures on CRP principles and workshops with experts from and on First Nation cultures	• Answers to anonymous online-surveys (pre and post) • Lessons plans • Interviews with two participants	• PSTs' knowledge and understanding of First Nation cultures increased • Some PSTs' confidence ratings, other PST's ratings decreased
Cantos et al. (2024)	Mixed-methods	Pre: 75 Post: 52	• One seminar (two hours) o Introduction to four LGBTIQA+ teachers' life stories o Opportunity for participants to ask questions, make comments, or share their own experiences afterwards	• Answers to 'Impact of LGBTIQA+ teachers' life stories on the trainee teachers' perceptions and beliefs about sex-gender diversity'-questionnaire (Cantos et al., 2023) • Answers to open-ended questions added in the post-test	• Perceptions and beliefs about sex-gender diversity changed and became more positive • Engagement with life-stories broadened participants' perspectives

60.3% as female. The last of the US studies was conducted at a university "in the Midwest of the United States" (I, 2019, p. 131), which was not further characterized by the author. This is similar to the two studies from Spain and the one from Australia. Ortega-Sánchez & Barba-Alonso (2023) simply reported that their study population had been enrolled "at a university in the north of Spain" (p. 3) and Cantos et al. (2024) identify the institution of their intervention as the University Jaume I located in Castellón at Spain's east coast. Paige et al. (2024) provided the least detail about the university, which was only deducible as the University of the South in Adelaide, Australia, from the authors' credentials and the ethics statement. Similarly, the studies varied in the degree in which they provided specific information on the ITE model and the exact context in which the intervention was adopted.

The overall model of ITE was specified in all studies and the subject focus of the participants in six of the seven studies. The interventions by Paige et al. (2024), Dibbs et al. (2023), and I (2019) were adopted in a concurrent model of ITE. The other four studies were conducted in a consecutive model of ITE (Cantos et al., 2024; Ortega-Sánchez & Barba-Alonso, 2023; Rutt & Muba, 2020; 2022). The participants of the study by Paige et al. (2024) were studying to become generalist primary classroom teachers and chose two additional learning areas in which they would qualify to teach up to year 10. At the time of the study, there were a total of eight learning areas, all of which were also infused with content about First Nations, i.e. Aboriginal and Torries Strait Islander, cultures and identities as mandated by national bodies and standards. The students who participated in this intervention chose mathematics and/or science as their additional learning areas. Similarly, the students participating in the intervention by Dibbs et al. (2023) were training to become middle-school mathematics teachers and were therefore enrolled in a course called 'History of Mathematics'. The subject focus is further shared for the participants in I's (2019) study. They were in their final year, i.e. year four of their ITE program, and had had all the general pedagogy courses and the first mathematics methods courses completed. In contrast to the two other studies by Paige et al. (2024) and Dibbs et al. (2023), the intervention by I (2019) was not part of a compulsory course.

The PSTs participated "outside their required coursework and field experiences" (I, 2019, p. 131). However, this was all the context provided by the authors of the studies conducted in a concurrent model of ITE.

As representatives of an intervention employed in a consecutive model of ITE, Rutt and Mumba's (2020, 2022) studies are complementary to each other and were conducted within the same context, i.e. a one-year, consecutive ITE program for students with an undergraduate degree in biology, earth science, chemistry, or engineering. The program spanned over three terms from summer 2018 to spring 2019 and would eventually qualify students to teach grades 6 – 12 in their subject area. According to the authors' description, the program consisted of general education courses, which also included multiple multilingual methods courses, subject-specific methods courses, and practicum experiences. Their intervention was implemented in two consecutive science methods courses scheduled in the fall and spring terms and forming part of the standard curriculum for their ITE program.

Finally, the two studies from Spain (Cantos et al., 2024; Ortega-Sánchez & Barba-Alonso, 2023) were also conducted within a consecutive model of ITE. However, both the studies provide limited information on the exact nature of the program and the wider context of their intervention. Ortega-Sánchez & Barba-Alonso (2023) indicated that their study was "included in the syllabus of the Master's Degree in Secondary Education" (Ortega-Sánchez & Barba-Alonso, 2023, p. 5) and involved students focussing on the social sciences. Cantos et al. (2024, p. 4) only specified the title of the course in which they adopted the intervention as "Educational Processes and Contexts, which is taught in the Master's Degree in Secondary Education Teacher Training […]."

4.2 Understanding of inclusion

The data for the extraction fields concerned with the definitional categories of inclusion adopted by the authors indicate that all of the studies focused on a specific aspect of identity, thus adopting a specified individualized definition according to Göransson & Nilholm (2014). The two studies from Spain (Cantos et al., 2024; Ortega-Sánchez & Barba-

Alonso, 2023) focused on sex-gender diversity, the studies from the USA on linguistic (I, 2019; Rutt & Mumba, 2022, 2020) or cultural (Dibbs et al., 2023) diversity, and the study from Australia (Paige et al., 2024) on cultural diversity. However, none of the studies explicitly referred to the concept of inclusive education or the wider developments in global and national policy making for inclusive education. The studies rather pointed to the barriers, which the respective groups of learners faced in accessing the subject content, or the difficulties teachers had when teaching a particular group of learners. Even though the underlying core idea of inclusion as described by Opertti et al. (2014) was not explicitly mentioned by any of the authors, the studies were motivated by the idea that there are marginalized groups of learners, and that this marginalization requires a specific response by educators. For each of the studies, there was first a group identified as marginalized and then, there was an intervention employed in response to that marginalization.

For example, in case of the studies concerned with linguistic diversity, the authors pointed to the difficulties encountered by English Language Learners (ELLs) in mathematics or science classrooms arising from language demands (I, 2019; Rutt & Mumba, 2020, 2022). They discussed that the integration of language and literacy in science and mathematics classrooms were necessary for ELLs to "advance to more rigorous science classes, a place where EL[L]s are traditionally underrepresented" (Rutt & Mumba, 2020, p. 842) but that teachers often lacked the knowledge and skills to adapt their lessons and materials accordingly. In that sense, ELLs were considered as being marginalized. Both, I (2019) and Rutt & Mumba (2020, 2022) then designed a potential response to that marginalization by testing interventions which aimed at providing PSTs with knowledge and skills to adapt plans and materials to the needs of ELLs. This process of identifying a marginalized group of learners and then designing a targeted response to that specific group was employed in a similar way by the studies focussing on aspects of sex-gender diversity (Cantos et al., 2024; Ortega-Sánchez & Barba-Alonso, 2023) and cultural diversity (Dibbs et al., 2023; Paige et al., 2024).

4.3 Design of the Interventions

The design of interventions across the reviewed studies reflected a diversity of approaches tailored to the specific needs of PSTs and their respective subject areas. These interventions often blended theory and practice, aiming to enhance pedagogical strategies through direct engagement with diverse learners.

I (2019) adopted a cyclical, reflective intervention design, which emphasized the modification of mathematics tasks to support ELLs. The intervention was iterative, allowing PSTs to first learn strategies for adapting tasks, which they implemented in the classroom, and then engage in a reflective process to assess their effectiveness. This cycle was repeated across five sessions, and each iteration focused on improving the complexity and appropriateness of task modifications. The key components of the design were simplifying the language of tasks, adding visual aids, and incorporating culturally relevant examples to help ELLs make meaningful connections to the subject matter. The reflective nature of the design allowed PSTs to continuously refine their approach. As previously noted, I's (2019) intervention was not part of the regular curriculum, and the participants engaged voluntarily.

In contrast, the intervention designed by Dibbs et al. (2023) relied on experiential learning using the *Bafa Bafa* cultural simulation, which is an intervention aiming at increasing cultural awareness by placing PSTs in simulated cultural environments that highlight the discomfort and dissonance often experienced by learners from diverse backgrounds. For the simulation participants were divided into two groups, each representing a distinct cultural community with its own norms and behaviors. PSTs were instructed to navigate interactions between these cultures with the intent to mirror the challenges faced by members of minority cultures in classrooms where they are unfamiliar with the dominant cultural norms. After the simulation, participants engaged in reflective discussions, which formed a crucial part of the design, as they helped to solidify the connections between the simulation and real-world teaching scenarios. This design was highly participatory, with the experiential component being central to fostering empathy and understanding among PSTs.

Cantos et al. (2024) used a mixed-methods design centered on storytelling as a pedagogical tool. The intervention involved teachers with lesbian, gay, bisexual, transgender, intersex, queer, asexual, and additional non-heterosexual or non-cisgender identities (LGBTIQA+), who shared their personal and professional experiences. These narratives were intended to humanize the issues of gender diversity and marginalization in educational settings and aimed at fostering empathy and awareness amongst the PSTs. Following the storytelling sessions, PSTs engaged in reflective activities and discussions, where they could explore the implications of these stories for their own teaching practices. The design aimed to move beyond theoretical discussions of sex-gender diversity by directly exposing PSTs to the lived experiences of marginalized teachers. By combining personal narratives with reflective exercises, the intervention sought to deepen participants' understanding of inclusion and diversity in the classroom.

The intervention in Paige et al. (2024) was designed to develop culturally responsive pedagogies (CRP) in the context of science and mathematics education, with a specific focus on incorporating First Nations' knowledge. This participatory intervention was multifaceted, involving documentary viewings, guest lectures from First Nations educators, and hands-on workshops. The design was intended to challenge PSTs to rethink their approaches to teaching science and mathematics by integrating Indigenous knowledge and perspectives. The inclusion of guest lectures and workshops provided opportunities for direct engagement with First Nations educators, while the reflective activities that followed these sessions allowed PSTs to process and apply what they had learned. The design also required PSTs to create transdisciplinary teaching units that embedded Aboriginal and Torres Strait Islander knowledge, ensuring that the intervention had both theoretical and practical components.

Rutt and Mumba (2020, 2022) designed an intervention focused on equipping PSTs with strategies for implementing language-rich science instruction for ELLs, measured with the 'Teaching English Learners Language- and Literacy-Integrated Science' (TELLIS) instructional framework developed by the authors (Rutt & Mumba, 2020). The intervention was structured around three core principles: leveraging students' funds of knowledge,

engaging ELLs in scientific discourse, and scaffolding language to support both content and language acquisition. The design combined theoretical instruction on the TELLIS framework with practical classroom applications, as PSTs were required to implement the TELLIS strategies during their field placements. The intervention emphasized a balance between maintaining the cognitive demand of science tasks and ensuring that ELLs had the linguistic support necessary to engage with the content. In the second study by Rutt and Mumba (2022), the data collection was extended to include more immersive field experiences, where PSTs worked directly with ELLs in diverse classrooms. This design placed greater emphasis on real-world applications of language-rich science instruction, offering PSTs the opportunity to refine their teaching strategies through direct interaction with ELLs.

Finally, Ortega-Sánchez and Barba-Alonso (2023) employed a quasi-experimental intervention designed to enhance historical awareness and the ability to address controversial topics, such as gender diversity and nationalism, in secondary education. The intervention consisted of four theoretical-practical seminars, each lasting 2.5 hours. The seminars were structured around short theoretical presentations, followed by group discussions and practical activities. These activities included the engagement with social media platforms, particularly popular science narratives that incorporated controversial historical issues. This design aimed to make history education more relevant and engaging by encouraging PSTs to address contemporary social problems through a critical lens. The focus on digital media as a platform for historical education was an innovative aspect of the design, as it encouraged PSTs to think about how history can be communicated and understood in the modern world.

4.4 Methodology of the Studies

The methodologies used to measure the effects and effectiveness of the interventions in the reviewed studies are as varied as the interventions themselves, with each study employing methods tailored to its specific focus. I (2019) adopted a qualitative approach, using a combination of videotaped teaching units, written reflections, and

task modifications to assess the impact of the intervention on PSTs' ability to teach ELLs in mathematics. Data collection occurred at multiple points throughout the intervention, with a particular focus on how PSTs modified tasks to make them accessible to ELLs while maintaining cognitive demand. The reflective journals provided insight into PSTs' thought processes as they navigated the challenges of task modification, while classroom observations allowed the researchers to assess how effectively these modifications were implemented in practice.

Dibbs et al. (2023) employed a mixed-methods approach to evaluate the impact of the cultural simulation on PSTs' cultural awareness. Quantitative data were collected through pre- and post-intervention surveys, which measured participants' understanding of cultural differences and microaggressions. The qualitative component consisted of reflective essays and interviews, where PSTs discussed their experiences during the simulation and how the simulation influenced their perspectives on teaching diverse learners. The combination of qualitative and quantitative data allowed the researchers to assess both the cognitive and emotional impact of the intervention, providing a comprehensive view of its effectiveness.

Cantos et al. (2024) also used a mixed-methods pre-test-post-test design, collecting quantitative data through surveys administered before and after the intervention. These surveys measured PSTs' attitudes towards gender diversity and their perceived ability to address these issues in the classroom. The qualitative component consisted of answers to open-ended questions in the post-test, where participants explored the personal and professional implications of the life stories shared by LGBTIQA+ teachers. The use of personal narratives as a central element of the intervention required a methodology that could capture both shifts in attitudes and deeper emotional engagement, which the combination of closed- and open-ended questions was found to effectively capture.

Paige et al. (2024) adopted a participatory methodology, combining pre- and post-intervention-surveys with open-ended questions and case studies based on lesson plans and interviews. While the surveys allowed to gather data on how PSTs integrated

First Nations knowledge into their teaching as they attempted to apply CRPs in their lesson planning, the two case studies provided additional insights into their thought processes.

Rutt & Mumba (2020) used a mixed-methods design to measure the impact of their intervention on PSTs' ability to implement TELLIS principles. Quantitative data were collected through surveys that measured PSTs' confidence and understanding of the TELLIS framework. The qualitative component included interviews and classroom observations, which provided deeper insights into how PSTs applied these principles in practice. Rutt & Mumba's 2022 study focused on three participants of the earlier study placing greater emphasis on qualitative data through detailed case studies. These case studies allowed the researchers to explore how individual PSTs navigated the challenges of working with ELLs in diverse classroom settings, providing a richer understanding of the intervention's effectiveness.

Ortega-Sánchez and Barba-Alonso (2023) used a quasi-experimental design with pre- and post-intervention testing to measure the impact of the intervention on PSTs' historical awareness and their ability to address controversial topics. The 'Epistemology, Methodology, and Gender in Taught History (EMG)'-scale (Ortega-Sánchez & Sevilla, 2020) was administered before and after the intervention to assess changes in participants' attitudes and competencies. Descriptive and inferential statistics were used to analyze the quantitative data, while qualitative reflections from the participants provided additional insights into their learning experiences.

4.5 Findings of the Studies

The findings across the seven studies reviewed provide insight into how interventions aimed at PSTs shape their ability to engage with diverse student populations. The results reveal positive effects in raising awareness of inclusivity, culturally responsive teaching, and language support, but also demonstrate recurring challenges in practical application, particularly in maintaining cognitive rigor within the classroom.

I (2019) found that PSTs successfully modified mathematics tasks to support ELLs by simplifying language and incorporating visual aids. These adjustments improved task

accessibility, but at the expense of intellectual challenge. PSTs frequently reduced the complexity of the mathematical tasks in their attempts to make them more comprehensible to ELLs. This tension between accessibility and cognitive demand emerged as a major limitation of the intervention, suggesting that PSTs need more structured support in learning how to balance the two. The study recommended further training to help PSTs maintain academic rigor while adapting tasks for diverse learners.

Dibbs et al. (2023) demonstrated that the *Bafa Bafa* cultural simulation contributed to an increase in PSTs' cultural awareness, particularly in recognizing the microaggressions that learners from diverse backgrounds might face. The simulation fostered empathy by immersing PSTs in culturally dissonant scenarios, mirroring the experiences of cultural minorities. Nevertheless, while the intervention heightened cultural awareness, a not further specified number of participants expressed uncertainty about how to apply this knowledge in classroom settings. Due to this gap between cultural understanding and practical teaching strategies, Dibbs et al. (2023) suggest that additional follow-up is necessary to help PSTs implement what they learned into concrete classroom practices.

Cantos et al. (2024) showed that the integration of LGBTIQA+ teachers' life stories broadened PSTs' perception of LGBTIQA+ related topics. The personal narratives provided PSTs with a clearer understanding of the challenges faced by LGBTIQA+ individuals, both within and beyond educational contexts. However, the study found a ceiling effect, as many participants already had positive attitudes toward sex-gender diversity, which limited the observable shifts in their perspectives. The findings suggest that while personal narratives are effective in reinforcing supportive attitudes, they may be more impactful with populations less familiar with LGBTIQA+ issues.

Paige et al. (2024) found that the intervention designed to integrate Aboriginal and Torres Strait Islander knowledge into science and mathematics teaching increased PSTs' awareness of First Nation-related issues in the educational context. The study reports an increase in some participants' confidence in using CRPs and a decrease of confidence in other participants' confidence. They attribute the contrast to the fact that an increased engagement with a topic can also lead to the realization that one's own

knowledge is not as far-reaching as assumed. Moreover, many PSTs struggled to fully embed Indigenous knowledge into their lessons, particularly in subjects like science and mathematics, which are often perceived as culturally neutral. The findings indicate that PSTs require more extensive training to incorporate indigenous perspectives meaningfully. The study emphasized that longer-term support is necessary for PSTs to confidently implement these strategies in practice, particularly when navigating between curriculum demands and culturally specific knowledge.

Rutt and Mumba (2020) found that while PSTs understood the principles of the TELLIS framework, they often simplified science tasks to the detriment of their cognitive complexity. This issue of reducing intellectual rigor in an effort to support ELLs parallels the findings from I (2019). PSTs were able to implement basic language supports, such as scaffolding and utilizing students' funds of knowledge, but they struggled to maintain the depth of scientific inquiry. This tension between accessibility and rigor emerged as a key limitation, indicating a broader challenge in teacher preparation for linguistically diverse classrooms. In their follow-up study, Rutt and Mumba (2022) expanded on these findings, emphasizing the value of immersive field experiences for PSTs working with ELLs. PSTs made more significant progress in applying language-rich instruction when given extended opportunities to work in real classroom environments. However, the study also noted ongoing difficulties in supporting ELLs' linguistic output, especially in creating opportunities for them to engage in scientific discussions. While PSTs improved in scaffolding input for ELLs, facilitating active language use remained a challenge. The findings suggest a need for a greater focus on developing strategies that support both language comprehension and production.

Ortega-Sánchez and Barba-Alonso (2023) found that their intervention significantly enhanced PSTs' historical awareness and their ability to address controversial topics, such as gender diversity. Participants became more committed to using history education as a platform for social transformation and democratic engagement. However, while PSTs were eager to incorporate controversial issues into their teaching, many struggled with the methodological rigor required to do so effectively. This finding suggests that future

interventions should include more focused training on methods to incorporate controversial issues in social science teaching to ensure that PSTs can engage with controversial topics in a more analytically robust manner.

In summary, the findings across these studies underscore the complexity of preparing PSTs to work with diverse student populations. While the interventions were generally successful in raising awareness of sex-gender diversity, cultural responsiveness, and linguistic diversity, the challenge of translating these concepts into practice remained a consistent limitation, which was further hampered by the studies' small sample sizes and the lack of evidence for the studies' long-term effects, making it difficult to generalize the results.

4.6 Summary of the Chapter

The studies presented above explored various interventions aimed at preparing PSTs for specific aspects of inclusive education, particularly in the fields of mathematics and science education. The interventions were conducted in different models of ITE, with the majority implemented in a consecutive model. Each study addressed a specific aspect of identity, such as linguistic, sex-gender, or cultural diversity, which were considered to cause marginalization; however, none of the studies explicitly referred to inclusion or wider policy developments. The interventions presented ranged from reflective practices to cultural simulations and storytelling. The findings across studies demonstrated positive impacts on PSTs' awareness and attitudes toward inclusivity, but they also revealed persistent difficulties in applying these principles effectively within classrooms. The limitations, such as small sample sizes and challenges in maintaining intellectual rigor, were consistent across the studies.

5 Discussion

The purpose of this study was to identify interventions employed during the ITE of secondary teachers to prepare them for diverse settings, specify the characteristics of the studies, analyse the evidence the studies produce, and compile interventions which could be adopted in ITE of secondary teachers for inclusive education. While the previous chapter presented the interventions, the specifics of each study, the evidence produced, and thus, compiled potential interventions for ITE for inclusive education, this chapter discusses these findings with regards to the wider context. This chapter links the results of the scoping review with the background presented in the Literature Review (see Chapter 2) and does so following the order of the two research questions presented in Section 3.1. As a result, the first section of this chapter addresses the characteristics of the interventions identified with a particular focus on how they relate to wider developments in education as well as the definitional aspects according to Göransson & Nilholm (2014) and Opertti et al. (2014). Then, the second section of this chapter focuses on the evidence produced by the studies. Moreover, the section also discusses how the evidence relates to ITE for the secondary levels of education and the further development of ITE for ISCED level 2 and 3 teachers for inclusive education. Afterwards, the third section will address limitations which might affect the interpretation of the findings, and lastly, Section 5.4 concludes the chapter with a summary of the discussion.

5.1 Characteristics of Interventions in Secondary ITE for Inclusion

As the results chapter revealed, the seven interventions identified addressed a variety of aspects such as linguistic diversity (I, 2019; Rutt & Mumba, 2022, 2020), sex-gender diversity (Cantos et al., 2024; Ortega-Sánchez & Barba-Alonso, 2023), and cultural diversity (Dibbs et al., 2023; Paige et al., 2024). Furthermore, the interventions varied in length, depth, and methods employed. For example, the intervention by Cantos et al. (2024) was employed during a two-hour seminar session with more than 75 students present and centered on four LGBTIQA+ teachers telling their life stories. In contrast, the intervention employed by I (2019) revolved around two of her students who participated outside the regular

curriculum of their ITE program in five intervention cycles, each of which consisted of a thematic input by the author, lesson planning, a practical application in a one-on-one-setting, and a guided reflection. Therefore, with regards to some characteristics, the interventions differ greatly from each other. However, at the same time, there are other characteristics which are similar across the individual interventions. First, all the interventions are small in scale and scope. The interventions were only adopted with a relatively small number of participants, and all adopted a narrow definition of inclusion. The latter corresponds in all cases to the specified individualized definition of inclusion (Göransson & Nilholm, 2014) and the core idea of inclusion as a response to marginalized groups (Opertti et al., 2014). Second, the studies and interventions reflect current discourses, policies, and societal developments of their contexts and might therefore be regarded as products of their local context. Finally, all the interventions were implemented within a subject-specific focus and reflect the initiative of individuals rather than institutions as a whole. With these characteristics the interventions align with various developments, findings and desiderates presented in the literature review chapter.

As shown by Opertti et al. (2014), the understanding of inclusion has changed over time and has broadened in scope. The interventions included in the scoping review mirror this development in that they focus on aspects of diversity other than categories of disability and SEN. The interventions do so without explicit reference to inclusive education by portraying a particular group, e.g., LGBTIQA+ individuals (Cantos et al., 2024) or ELLs (I, 2019; Rutt & Mumba, 2022, 2020), as marginalized and then, presenting an intervention to prepare teachers for engagement with the respective group as a potential response to the marginalization. By centering on linguistic, sex-gender, and cultural diversity, the interventions address aspects of diversity which have been mentioned explicitly and more frequently in recent global initiatives (UN, 2015; UNESCO, 2018, 2019). Furthermore, by centering on linguistic and cultural diversity, the interventions by I (2019), Rutt & Mumba (2022, 2020), Dibbs et al. (2023), and Paige et al. (2024) cover aspects of diversity which have been reported to be missing in the ITE of secondary

school teachers (OECD, 2019; UENSCO, 2020) and might therefore be seen as a response of research to the perceived need of teachers.

The individual focus of the studies on one aspect of diversity reflects the fact that global initiatives have to be translated into regional contexts and are thereby influenced by those regions' already existing policies, dominating discourses, and perceptions of needs within the educational system (Magnússon, 2019). In the USA, for example, ELLs have received increased attention due to changing demographics: "Growth projections of the ELL population speculate that by the 2030s the number of Language Minority […] students will constitute 40 percent of the school-age population" (Besterman et al., 2018, p. 165). This situation has triggered multiple policy-initiatives and a discourse on how to best support ELLs within the regular education system on a national level (Besterman et al., 2018), which is referred to by the three studies addressing linguistic diversity (I, 2019; Rutt & Mumba, 2022, 2020). This is also the case for the two studies focusing on sex-gender diversity from Spain (Cantos et al., 2024; Ortega-Sánchez & Barba-Alonso, 2023) where the "[l]aw establishes the need to promote tolerance and respect for gender and sexual diversity in schools, but there are no specific guidelines or regulations on the inclusions of LGBTIQ[A]+ issues in the classroom." (Palacios-Hidalgo & Huertas-Abril, 2024, p. 51) and the study by Paige et al. (2024) which refers to the local policy framework and recent national initiatives to address the marginalization of indigenous people within the educational system in Australia.

A final characteristic shared by the interventions is that they were situated within a particular subject within ITE rather than within a stand-alone course on inclusion or general methods course. Even the intervention presented by I (2019) was clearly linked to subject content, i.e. mathematics, even though it took place outside the regular curriculum of her participants' ITE program. This is noteworthy with regards to the specific challenges described for the development of inclusive education on the secondary levels of education in Section 2.3. Teachers for said levels are mainly trained as subject specialists and tend to neither feel competent nor responsible for differentiation or accommodating individual needs because these aspects are not addressed in their

initial education (De Vroey et al., 2015; Pearce & Forlin, 2005). The interventions reviewed could be seen as a response to that situation in that they foster a greater sense of responsibility for all learners and in that they increase the perceived preparedness to address diverse student groups amongst PSTs for the secondary levels of education by actively placing challenges arising from student diversity within the subject area and, thus, making the content more relevant and normalized to the PSTs (De Vroey, Symeonidou, et al., 2022).

5.2 Evidence for the Further Development of Secondary ITE for Inclusion

There are two ways of approaching the kind of evidence produced by the studies under review and evaluating its implications for the further development of ISCED level 2 and 3 ITE for inclusive education with a broad understanding of inclusion in mind. First, the evidence might be discussed as regards to how it relates to a broad understanding of inclusion. The short answer to this question is 'not at all'. While they provide potentially useful strategies for teachers to address singular aspects of diversity, the studies reviewed do not provide any evidence on how to better prepare teachers for generally diverse student populations and the adoption of a broad understanding of inclusion in general. Therefore, the outcome of the scoping review in line with this first approach, might be interpreted as a reflection of the general struggle in the field of inclusive education which eventually results in what Göransson & Nilholm (2014) have called "tumble-weed referencing" (p. 276). The second way of approaching the kind of evidence presented by the studies of the scoping review is to take its irrelevance to the second research question, i.e. the lack of evidence itself, as evidence for the urgent need for more research on how to prepare secondary school teachers for inclusive education and diverse student populations during their ITE with a broad understanding of inclusion in mind. While on a global level, policy initiatives and conventions solidify the call for inclusive education in a broad sense on all levels of education (UN, 2008, 2015, 2016; UNESCO, 2000), secondary schools are still found to struggle with inclusion and secondary school teachers all around the world keep reporting that they feel un- or underprepared

for diverse settings (De Vroey et al., 2015; OECD, 2019; Pearce & Forlin, 2005). Thus, it seems of utmost importance to invest more research into how to better prepare secondary school teachers for diverse settings and produce reliable evidence for the further development of ITE for ISCED levels 2 and 3. This section will discuss both these approaches, starting with the first.

As presented in the results chapter, all the seven studies that were included in the scoping review were concerned with particular aspects of diversity. They implicitly built on the core idea of inclusion as a response of the educational system to marginalized groups (Opertti et al., 2014) and employed a specified individualized definition of inclusion (Göransson & Nilholm, 2014). Even though they went beyond the categories of disability and SEN, the studies still took a relatively narrow approach to inclusion and placed the focus on a single aspect of diversity. Regarding the respective aspect of diversity, the studies showed at least some positive effects of the interventions on the teachers' knowledge and/or skills and/or sense of preparedness. However, by focusing on a particular group of learners, the studies perpetuate the idea that special knowledge and skills are needed to teach particular groups of learners (Brantlinger, 2005). While certain teaching strategies are certainly useful for particular learners, they might also act as barriers, which was discussed in the literature review with regards to the findings by Norwich & Lewis (2007) on the impact of SEN-knowledge on a teacher's sense of competence. Similarly, the studies could act as a barrier to inclusion in that they present knowledge on ELLs (I, 2019; Rutt & Mumba, 2022, 2020), LGBTIQA+ individuals (Cantos et al., 2024; Ortega-Sánchez & Sevilla, 2020) and cultural minorities (Dibbs et al., 2023; Paige et al., 2024) as distinct kind of knowledge required to successfully engage with students associated with these labels and, thus, making teachers without explicit instruction on these aspects of diversity reluctant and feel incompetent to engage with said students. In that sense, the studies do not provide a solid evidence-base for the further development of ITE for inclusive education even if a narrow approach to inclusion is adopted and even less so if a broad approach to inclusion is chosen. By failing to do so, the studies ultimately contribute to "tumble-weed referencing" (Göransson & Nilholm,

2014, p. 276). They introduced the term when analysing the nature of the evidence discussed in research on inclusive education at the school level

> "[…] for cases where evidence in referenced studies is weak or non-existent. 'Tumble-weed referencing' is very common in research about inclusive education. This follows from the fact that there is hardly any reliable evidence as regards the factors that makes schools and classrooms more inclusive, yet research is referenced as if such connections have been established." (Göransson & Nilholm, 2014, p. 276).

This seems also the case for the development of ITE for inclusion. While proponents of an inclusive pedagogy (Florian & Black-Hawkins, 2011) and authors of previous reviews (De Vroey, Symeonidou, et al., 2022; Symeonidou, 2017) propose a variety of aspects to consider when developing ITE for inclusive education, with a broad understanding of inclusion this study could not identify any reliable evidence-base for doing so in ITE for the secondary level of education.

These circumstances automatically lead to the second approach to the evidence provided by the studies included in the scoping review. Chapter 2 discussed recent developments in education and pointed to the specific challenges that arise when implementing inclusion on the secondary levels of education. On one hand, there is a clear trend towards adopting a broad understanding of inclusion in global policy making reflected by conventions and initiatives such as the CRPD (2006), the SDGs (UN, 2015), and the EU's *Profile for Inclusive Teacher Professional Learning* (De Vroey, Lecheval, et al., 2022). Simultaneously research has pointed to the fact that the secondary levels of education are faced with specific challenges when implementing inclusion such as a strong subject-focus, rigid timetables, or high accountability in connection to the transition function of secondary education (Cochran-Smith & Villegas, 2016; De Vroey et al., 2015; Pearce & Forlin, 2005; Werning & Arndt, 2013), and secondary school teachers are reported to feel un- or underprepared for teaching a diverse student population (OECD, 2019; UNESCO, 2020). If the policies and conventions are to be translated into

practice, finding ways of adequately preparing ISCED level 2 and 3 teachers for their work in inclusive and diverse settings should therefore be of utmost importance. In that sense, the fact that this scoping review could not identify any reliable evidence from within the last seven years for doing so, should be concerning and points to how great the need for further research into ISCED level 2 and 3 ITE for inclusion and testing interventions for said levels is.

5.3 Limitations

Despite the comprehensive approach adopted in this scoping review, several limitations should be acknowledged that may impact the interpretation and generalizability of the findings. They are concerned with the potential language bias, the exclusion of earlier publications, the scope and scale of the interventions, data extraction, and the scope of this review. First, the language bias in the literature search is a significant limitation. As only studies published in English were included, relevant studies in other languages were excluded, which may have led to an incomplete understanding of interventions in non-English-speaking regions. This exclusion introduces a potential cultural bias and limits the global applicability of the results (Machi & McEvoy, 2016), especially considering the diverse educational contexts in which inclusive education is being implemented (Magnússon, 2019). Second, the exclusion of earlier publications limits the temporal scope of the review. While the decision to focus on studies published from 01 October 2016 onwards aligns with the aim of capturing recent developments, it inadvertently excludes foundational work that may still be relevant to the evolving understanding of inclusive education and the development of interventions for teachers. Another limitation concerns the scope and scale of the reviewed interventions. The majority of studies identified in the review were small in scale, conducted within a single institution and with a limited number of participants. This restricts the generalizability of the findings across different educational systems and contexts. Additionally, the interventions were typically short-term, with little or no follow-up to assess long-term impact on PSTs once they entered the teaching profession. This lack of longitudinal research diminishes the

understanding of if and how these interventions translate into sustained practice in inclusive education. A further limitation is the potential for bias in the data extraction and synthesis processes. As this review was conducted by a single researcher due to the constraints of a master's dissertation, there is a heightened risk of subjective bias in the selection and interpretation of studies. Although efforts were made to mitigate this through consultation with a subject librarian and adherence to the PRISMA-ScR checklist, the absence of multiple reviewers could affect the reliability and transparency of the results. Finally, the inclusion criteria limit the interpretation and generalizability of the findings both, because of some broad inclusion criteria and particularly one narrow inclusion criterion. On one hand, the criteria allowed for capturing a wide range of interventions with regards to their specifics and the methodology adopted. This may have contributed to considerable heterogeneity among the studies, complicating the synthesis of findings and limiting the ability to provide definitive recommendations for policy or practice. On the other hand, excluding research on induction phases, CPD, and teacher education on other levels of education may have further increased the risk for an incomplete understanding of interventions in secondary ITE for inclusive education.

5.4 Summary of the Chapter

The previous sections synthesized the findings from the scoping review on interventions within secondary ITE for preparing teachers for inclusive education and the insights from the literature review in Chapter 2, focusing on two main aspects: the characteristics of these interventions and the evidence they provide for the future of secondary ITE for inclusion. The scoping review identified seven interventions which targeted linguistic, cultural, or sex-gender diversity and varied in scale and scope reflecting diverse approaches to teacher preparation. The discussion showed that both, the differences in characteristics of the interventions as well as the commonalities may be linked to wider developments in inclusive education on one hand and, on the other hand, reflect the local contexts within which the studies were conducted. The discussion pointed to the fact that the studies reflect the global trend to adopt a broader understanding of

inclusion in education but at the same time fail to move beyond understanding inclusion as a response to marginalized groups (Opertti et al., 2014) and adopting a specified individualized definition (Göransson & Nilholm, 2014). Moreover, the discussion further showed that because of the narrow conceptualization of inclusion, the interventions reviewed do not provide any evidence-base for the further development of ITE for inclusion for the secondary levels of education with a broad approach in mind. Instead, the discussion revealed that the previously described issues of implementing inclusion on ISCED levels 2 and 3 (De Vroey et al., 2015; Pearce & Forlin, 2005) and the reported needs of teachers (OECD, 2019; UNESCO, 2020) are addressed by neither study included in the scoping review. Instead, the lack of evidence points to the urgent need for more research on and the further testing of interventions in secondary ITE for inclusion.

6 Conclusion

This dissertation has examined the landscape of interventions within ITE programs aimed at preparing secondary school teachers for inclusive education. Through a scoping review of seven studies conducted across the USA, Spain, and Australia, it explored interventions designed to equip PSTs with the skills and knowledge necessary to engage with diverse student populations (Cantos et al., 2024; Dibbs et al., 2023; I, 2019; Ortega-Sánchez & Barba-Alonso, 2023; Paige et al., 2024; Rutt & Mumba, 2022, 2020). The research sought to identify the characteristics of these interventions and evaluate the evidence they provide regarding their effectiveness in preparing teachers for inclusive education at the secondary level of education.

One of the key findings of this review is that all the interventions studied focused on specific aspects of diversity, such as linguistic, sex-gender, and cultural diversity. The reviewed studies highlighted interventions that targeted groups which were considered marginalized, including ELLs (I, 2019; Rutt & Mumba, 2020 2022), LGBTIQA+ individuals (Cantos et al., 2024), and students from Australian First Nations communities (Dibbs et al., 2023). Therefore, while this focus aligns with broader trends in global education policy, which emphasize the need for inclusion beyond the traditional categories of disability and SEN (Opertti et al., 2014), the interventions tended to adopt a narrow, specified individualized understanding of inclusion (Göransson & Nilholm, 2014). They primarily aimed to increase PSTs' awareness and sensitivity toward the challenges faced by these specific groups, rather than fostering a holistic approach to inclusive teaching that benefits all students.

The narrow focus of these interventions can be seen as a reflection of the persistent tension in the field of inclusive education between addressing the needs of marginalized groups and developing a broad, systemic approach to inclusion (Göransson & Nilholm, 2014; Opertti et al., 2014). Although global policy frameworks call for the transformation of educational systems to accommodate all learners (De Vroey, Lecheval, et al., 2022; UN, 2015; UNESCO, 1994, 2000), the practical implementation of these policies in ITE remains limited particularly on the secondary level of education (De Vroey et al., 2015;

Pearce & Forlin, 2005; Werning & Arndt, 2013). The interventions identified in this review reflect a reactive rather than proactive approach to inclusion, focusing on specific groups as they emerge as areas of concern rather than embedding inclusion as a fundamental principle in teacher preparation.

For example, interventions aimed at supporting ELLs in mathematics and science classrooms (I, 2019; Rutt & Mumba, 2020, 2022) emphasized strategies for adapting teaching materials to make them more accessible. While these interventions were successful in helping PSTs modify tasks to support ELLs, they also revealed a recurring challenge: PSTs often reduced the cognitive complexity of tasks to make them more comprehensible, which can undermine the academic rigor expected in secondary education. This issue of balancing accessibility with intellectual challenge is a common theme across the studies and highlights a critical area for further development in teacher education. PSTs need more guidance on how to maintain high academic standards while individualizing instruction for diverse learners.

The limitations of the existing research on ITE for inclusive education are also worth noting. The scoping review revealed that the interventions identified are generally small in scale and scope, with limited evidence of their long-term effectiveness. Most of the studies reviewed were conducted with small sample sizes, often within a single institution or geographical region, which raises questions about the generalizability of their findings. Additionally, the interventions tended to be short-term, ranging from a few weeks to a single academic term, with little follow-up to assess their lasting impact on PSTs' practices once they enter the workforce. This lack of longitudinal research is a significant gap in the literature and underscores the need for future studies to track the long-term outcomes of ITE interventions to determine their true effectiveness in preparing teachers for inclusive education.

Furthermore, the reviewed studies rarely engaged with the broader, systemic issues that underpin the challenges of inclusion in secondary education. The structural barriers inherent in secondary schooling, such as subject-focused curricula, rigid timetables, and high-stakes assessments, were often left unaddressed. These systemic factors make it

difficult for teachers to implement flexible, inclusive teaching practices regarded as key for the successful implementation of inclusive education (Florian & Black-Hawkins, 2011; Pearce & Forlin, 2005)I. To fully realize the goals of inclusive education, future research and teacher education programs must address these structural barriers and work toward transforming the educational system to support inclusion at all levels.

In light of these findings, this dissertation concludes that while interventions in ITE for inclusive education have made important strides in raising awareness and fostering empathy among pre-service teachers, they remain limited in their scope and practical application. There is a pressing need for more comprehensive, evidence-based interventions that move beyond addressing the needs of specific marginalized groups and focus on preparing teachers to work with all learners in diverse settings. The insights gained from the scoping review suggest, that such interventions should be designed to integrate theoretical knowledge with sustained, hands-on experience in the classroom, allowing PSTs to develop and refine inclusive teaching strategies in real-world contexts. However, at this point that claim is not much more than "tumble-weed referencing" (Göransson & Nilholm, 2014, p. 276). Therefore, future research must focus on creating a solid evidence-base for developing effective ITE for inclusion.

Ultimately, the success of inclusive education depends not only on individual interventions but on the broader transformation of educational systems and, thus, also the broader transformation of teacher education programs. By embedding inclusion as a core principle of ITE and addressing the systemic barriers that hinder its implementation, we can better equip teachers to meet the needs of all learners and create truly inclusive educational environments.

7 References

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Appendix: Prisma-ScR Checklist (Tricco et al. 2018)

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	p. i
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	p. iv
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	p. 15
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	p. 14
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	p. 15
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	p. 20
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	pp. 16 and 18
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	pp. 17 - 18
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	pp. 20 - 21
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	pp. 22 - 23
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	pp. 22 - 23
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	N/A
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	pp. 22 - 23

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	p. 25
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	pp. 30 - 31
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	N/A
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	pp. 30 - 31
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	p. 29 - 42
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	pp. 43 -49
Limitations	20	Discuss the limitations of the scoping review process.	pp. 23, 49 - 50
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	pp. 52 - 54
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	N/A

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.
* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.
† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).
‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.
§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

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2