

# Approaching teaching to teach for digital citizenship

Social science teacher education  
through a postdigital lens

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*Like air and drinking water,  
being digital will be noticed only  
by its absence, not its presence*

*Negroponte (1998)*



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# Abstract

Citizenship education requires well-trained teachers to support young people's participation in democratic life where digital technologies and social practices are inseparable. Social science teacher educators prepare student teachers for this work amid complex institutional dynamics and rapidly shifting demands for digital citizenship and professional digital competence including artificial intelligence. This thesis aims to contribute knowledge on how these teacher educators approach teaching to teach for digital citizenship in such postdigital contexts, exploring and analyzing the conditions for such teaching within institutional arrangements. Employing a postdigital lens within an emergent research design, the thesis comprises four interconnected studies. These encompass theoretical analysis of digital citizenship conceptualizations, document reviews and interviews with teacher educators in Core Education Subjects and social science subject courses at a third of Sweden's teacher education institutions, and a national survey across all institutions. Analytical approaches included qualitative content analysis, reflexive thematic analysis, and convergent mixed methods with quantitative priority.

The results show systematic variation in teacher educators' approaches to digital citizenship education. Like in literature, conceptualizations vary from instrumental approaches to recognizing entangled sociotechnical relations. Despite general acknowledgment of digital citizenship's importance, the substantial variation in conceptualizations extends to roles, responsibilities, and professional digital competence. Disciplinary background and schoolteacher experience emerge as key factors shaping both competence and approaches, alongside various institutional arrangements that amplify variation. The compounded result is fragmentation, where digital citizenship risks becoming an institutional blind spot with implications for student teacher preparation equivalence.

Practical implications include institutional support through program coordination, enabling cross-disciplinary collaboration, professional development, and policy clarity. These include a reframing of professional digital competence from person-centered toward ecologically situated capabilities responsive to institutional and sociotechnical contexts.

**Keywords:** artificial intelligence; digital citizenship; institutional arrangements; postdigital; professional digital competence; social science teacher education; teacher educators

# Sammanfattning på svenska

Skolans uppdrag gällande ungas medborgarbildning är grundläggande i de flesta utbildningssystem. Genom att fostra unga till aktiva samhällsmedborgare skall demokratin återskapas, vilket ställer krav på lärarutbildarna som förbereder nya lärare för denna uppgift. I takt med att digital teknik alltmer genomsyrar samhället förändras förutsättningarna för detta arbete. År 2026 utmanas demokratin runtom i världen, desinformation sprids genom sociala medier och algoritmer påverkar hur vi tar del av information och agerar som samhällsmedborgare. Generativ artificiell intelligens (AI), som blev allmänt tillgänglig med språkmodeller som ChatGPT i november 2022, riskerar att förstärka dessa dynamiker. Hur vi lever våra liv och deltar i samhället har blivit oskiljbart från digital teknik. Lärarutbildares förberedelse av nya lärare för medborgarbildning har sannolikt aldrig varit så viktigt och komplex som nu i dessa postdigitala kontexter.

Denna avhandling handlar om hur lärarutbildare i sådana kontexter förbereder blivande samhällskunskapslärare för att undervisa för ett *digitalt medborgarskap*: kunskaper, förmågor, attityder och värderingar kopplade till digital teknik. Samhällskunskapsämnet i grund- och gymnasieskolan har en särskild roll för ungas möjligheter att utveckla sitt digitala medborgarskap. För lärarutbildare innebär det en *dubbeldidaktisk uppgift*: att undervisa både om stoff kopplat till digitalt medborgarskap och lära blivande lärare att undervisa detta stoff. Denna uppgift kräver *professionell digital kompetens* (PDK), det vill säga relevanta professionsspecifika kunskaper och färdigheter samt en förståelse av digital teknik i utbildning och samhälle.

Avhandlingens syfte är att bidra med kunskap om hur lärarutbildare närmar sig deras dubbeldidaktiska uppgift att undervisa för ett digitalt medborgarskap i postdigitala kontexter. Fokus ligger på att utforska och analysera förutsättningarna för sådan undervisning givet de organisatoriska strukturer, policydokument och professionella förhållanden som präglar universitet och högskolor. I avhandlingen beskrivs detta med engelskans *arrangements*, vilket är bredare än svenskans "ramar" och omfattar alltifrån resurser, upplägg och hur dessa är ordnade till själva ordnandet. Begreppet fångar spänningar och dynamiker i samhällskunskapslärarutbildningens förutsättningar. Vissa är gemensamma för alla lärarutbildningar i Sverige. Nationella styrdokument tolkas och iscensätts vid varje lärosäte som i sin tur kan ha

olika organisationsstrukturer. Andra förutsättningar är specifika för samhällskunskapslärarytbildningen. Skolämnet samhällskunskap har ingen akademisk motsvarighet utan hämtar sitt innehåll från flera discipliner, vilket ställer krav på programkoordinering. Samtidigt är skolämnet i ständig rörelse eftersom en central del av stoffet hämtas från den aktuella samhällskontexten. En återkommande observation i utvärderingar och forskningslitteraturen har därför varit avståndet mellan vilka kunskaper och färdigheter samhällskunskapslärarytbildningen möjliggör för lärarstudenter och de krav som väntar i den framtida yrkesutövningen.

Avhandlingen bygger på fyra sammankopplade delstudier inom en framväxande (*emergent*) forskningsdesign, vilket innebär att studierna vuxit fram i takt med att nya teoretiska och empiriska insikter gjorts under avhandlingsarbetet. Det empiriska materialet består av tre texter som på olika sätt beskriver teoretiska konceptioner av digitalt medborgarskap, intervjuer med 31 lärarytbildare och 47 enkätsvar samt 56 kursdokument. Den första delstudien fokuserar på hur olika sätt att beskriva digitalt medborgarskap i litteraturen förhåller sig till en förståelse av postdigitala kontexter. Delstudie två och tre bygger på dokumentanalyser och intervjuer med lärarytbildare vid en tredjedel av de lärosäten som förbereder ämneslärare: dels inom den utbildningsvetenskapliga kärnan, dels ämneskurser inom samhällskunskapsämnet. Den fjärde delstudien bygger på en mixed methods-enkätundersökning omfattandes alla lärosäten som utbildar samhällskunskapslärare. Analysmetoderna inkluderar kvalitativ innehållsanalys, reflexiv tematisk analys och konvergent mixed method-integration med kvantitativ prioritering.

Genomgående i avhandlingen används en postdigital lins för att rikta fokus mot hur lärarytbildare närmar sig undervisning för ett digitalt medborgarskap. Ett viktigt grundantagande är att digital teknik och sociala praktiker är *sociotekniska*: de formar varandra ömsesidigt i samhället. Därmed utmanar linsen instrumentella sätt att se på digital teknik som neutrala ”verktyg”. I postdigitala kontexter är medborgarskap och digital teknik oskiljaktiga samtidigt som sociotekniska miljöer är i ständig förändring. Linsen fungerar både teoretiskt för att situera lärarytbildares arbete och analytiskt för att förstå hur de närmar sig detta arbete inom institutionella arrangemang. Detta möjliggör analys till exempel av hur lärarytbildares olika sätt att närma sig undervisning för ett digitalt medborgarskap återspeglar olika synsätt på relationen mellan människa och teknik. Linsen möjliggör även en förståelse av PDK som relationell, framväxande inom och avhängig av institutionella

arrangemang som i sin tur är sammanflätade med bredare samhällsstrukturer kopplade till demokrati, makt och rättvisa.

Resultatet visar på systematisk variation i hur lärarutbildare närmar sig denna undervisning. Både i litteraturen och bland lärarutbildare varierar förståelserna av digitalt medborgarskap, från förhållningssätt där digital teknik beskrivs som neutrala verktyg till postdigitala förståelser där digitala och sociala praktiker smälter samman. Generellt är lärarutbildarna samstämmiga gällande betydelsen av att adressera digitalt medborgarskap i utbildningen. Däremot syns variationen även i uppfattningar om roller, ansvar och PDK. En viktig faktor är disciplinär bakgrund, vilket formar både förhållningssätt och PDK, till exempel om stoff såsom AI:s betydelse för demokratiska praktiker ligger inom deras ansvarsområde. Undervisningserfarenhet från skolan förefaller dock vara viktigare än disciplinär bakgrund, men det går inte att dra säkra slutsatser utifrån det empiriska materialet. Vidare förstärker institutionella arrangemang denna variation. Det handlar om lokal organisation, tydlighet i ansvarsområden och fortbildningsinsatser. Många lärarutbildare förlitar sig på att någon annan ansvarar för att digitalt medborgarskap adresseras, till exempel programansvariga eller en kollega som undervisar i en annan kurs. Andra lärarutbildare adresserar digitalt medborgarskap i sin undervisning utifrån hur de tolkar sitt uppdrag genom lärarutbildningens styrdokument och kopplingarna till skolämnet samhällskunskap, skolans demokratiuppdrag och den digitalt impregnerade samhällskontexten. Det sammantagna resultatet är fragmentering, det vill säga digitalt medborgarskap riskerar att bli en institutionell blind fläck med konsekvenser för likvärdigheten i hur lärarstudenter förbereds inom och mellan lärosäten. Ytterst får det konsekvenser för skolans demokratifostrande roll och uppdrag, inte minst för de unga som redan navigerar utbildningsmässiga utmaningar där välutbildade lärares insatser är avgörande.

Slutsatserna som dras är att postdigitala kontexter utmanar både hur medborgarbildning kan förstås och vad det innebär för lärarutbildare att förbereda blivande lärare för att undervisa om det i skolan. I relation till policy får resultatet särskild betydelse i ljuset av pågående reformer och strategiska initiativ i Sverige. Det handlar om minskade inslag av demokrati i lärarutbildningarna och digital kompetens i skolans läroplaner samtidigt som utbildningsområdet lämnas utanför landets nästa nationella AI-strategi. Den sammantagna risken är intensifiering av ovan nämnda fragmentering.

I stället för mer centralisering eller decentralisering pekar resultaten på *koordinerad decentralisering*: lokal autonomi med tydligare policyramar och stöd för institutionell samordning. Detta inkluderar förankring av en gemensam bild av hur lärarutbildningens examensmål förhåller sig till varandra, särskilt mellan demokrati och digital kompetens. På lärosätetsnivå betonas behovet av en programöverskridande vision för hur digitalt medborgarskap adresseras, inklusive progression och ansvarsfördelning. Fortbildningsmöjligheter måste adressera djupare epistemiska dimensioner av PDK utifrån lärarutbildares professionella förutsättningar. Tydlighet kring ansvar kombinerat med samordningsmekanismer kan bidra till en tvärvetenskapligt rik undervisning där lärarutbildare agerar undervisningsförebilder. Samtidigt kan sådana mekanismer bidra till att säkerställa att undervisning för ett digitalt medborgarskap inte blir allas ansvar och därmed ingens ansvar.

Lärarutbildares arbete kan inte förstås som isolerat varken från deras institutionella arrangemang eller den bredare samhällskontexten lika lite som medborgarskap kan förstås som isolerat från digital teknik. Detta är en viktig insikt i arbetet med lärarutbildningarnas responsivitet. Ytterst är denna responsivitet, via lärarutbildningarna och senare skolan, kopplad till kommande generationers möjligheter till demokratiskt deltagande, inte minst möjligheterna att föreställa sig och bygga rättvisare, hållbarare och mer demokratiska samhällen i framtiden.

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Umeå, January 2026

# List of included papers

This compilation thesis includes these four papers:

1. Örtégren, A. (2024). Philosophical underpinnings of digital citizenship through a postdigital lens: Implications for teacher educators' professional digital competence. *Education and Information Technologies*, 29(4), 4253–4285. <https://doi.org/10.1007/s10639-023-11965-5>

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2. Örtégren, A. (2022). Digital citizenship and professional digital competence – Swedish subject teacher education in a postdigital era. *Postdigital Science and Education*, 4(2), 467–493. <https://doi.org/10.1007/s42438-022-00291-7>

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3. Örtégren, A., & Olofsson, A. D. (2024). Pathways to professional digital competence to teach for digital citizenship: Social science teacher education in flux. *Teachers and Teaching*, 30(4), 526–544. <https://doi.org/10.1080/13540602.2024.2342860>

*Collaboration on planning, data coding, final review of manuscript pre-submission. I was responsible for document analysis, generating data and themes, and writing the paper (except first draft of introduction). Reprinted as Open Access (CC BY 4.0).*

4. Örtégren, A. (under review.). Teaching for digital citizenship in AI-infused societies: How social science teacher educators' disciplinary backgrounds relate to professional digital competence across Swedish institutions.

*Submitted manuscript included.*



# Introduction

Underpinning most education systems is the notion that democracy is not a once-and-for-all achievement but needs to be won by each generation. Schools contribute to this by fostering in young people certain knowledge, skills, attitudes, and values (Biesta & Lawy, 2006). From this emerges the imaginary of an ideal citizen—the democratic citizen—by molding which schools contribute toward building a democratic society (Carr & Hartnett, 1996; Englund, 1986/2005; Westheimer & Kahne, 2004).

Teaching for democracy is, therefore, inherently linked to promoting young people’s citizenship education. Such teaching is complex and requires well-trained teachers (Bombardelli et al., 2021; Campbell et al., 2012; Westheimer, 2022). As the institutional site for preparing teachers, teacher education (TE) is therefore also an important site of citizenship imaginaries, reflecting “the aspirations for citizens of the future, as well as the present” (Menter, 2023, p. 26). The stakes of this citizenship formation have intensified. After decades of democratization (Huntington, 1991), the new millennium has witnessed trends of accelerating democratic backsliding, authoritarian populism, and war reintroduced on the European continent. By 2026, there are once again fewer democracies than autocracies in the world, and for the average world citizen, democracy has regressed to 1985 levels (Nord et al., 2025). These democratic crises unfold within and through digital infrastructures, where disinformation spreads through social media, surveillance reconfigures civic participation, and algorithmic systems reshape epistemic practices and mediate democratic engagement (Hintz et al., 2019; Zuboff, 2019). Generative artificial intelligence (AI<sup>1</sup>), which became widely accessible in 2022, intensifies these dynamics (Coeckelbergh, 2025; Innerarity, 2024). Teacher educators’ (TEDs) preparation of student teachers for citizenship education has possibly not been more important since the end of World War II, and never more complex given digital technologies’ entanglement with democratic life.

Against this backdrop, this thesis is about how TEDs in Swedish social science TE approach teaching to teach in ways that address citizenship education specifically related to digital technologies. Social science TE

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<sup>1</sup> In this thesis, AI encompasses a range of technologies including automated decision-making, virtual assistants, and recommendation algorithms, and generative technologies for text, image, audio, and video.

prepares student teachers to teach social science education, a lower and upper secondary school subject (students aged 13–19) focused on citizenship, democracy, and societal participation. TEDs in social science TE thus have a *dual-didactic task* of teaching to teach (Murray & Male, 2005): as second-order teachers rather than first-order school teachers, they must teach student teachers both citizenship content and how to teach that content to young people in schools in ways that foster democratic attitudes and values. This thesis focuses on how TEDs approach this task within institutional arrangements, namely the organizational structures, policies, and professional conditions of universities and university colleges.

Specifically, the thesis focuses on university-based TEDs working through academic course work, rather than school-based TEDs who mentor student teachers during practicum. Through this preparation, TEDs develop student teachers' capabilities to support young people's active participation in democratic life as members of a digitally-infused society, i.e., young people's *digital citizenship education*: relevant knowledge, skills, attitudes, and values (Cosgrove & Cachia, 2025; Frau-Meigs et al., 2017). Central to understanding how TEDs approach this work is their *professional digital competence* (PDC), namely the capabilities they draw upon when approaching teaching to teach for digital citizenship.

I approach TEDs' work through a *postdigital lens* (Jandrić et al., 2018), which holds that digital technologies and social practices are sociotechnical, that is, mutually constitutive in societal contexts (MacKenzie & Wajcman, 1999). As Jandrić et al. remark (2018), "We are increasingly no longer in a world where digital technology and media is separate, virtual, 'other' to a 'natural' human and social life" (p. 893). Through this lens, I treat postdigital contexts as entanglements of humans, social practices, and digital technologies that reconfigure citizenship in ways that blur offline–online and analog–digital boundaries. These technologies include, for example, physical networks, smart phones, and AI (Brennen & Kreiss, 2016). This framing moves beyond instrumental approaches that treat digital technologies as neutral "tools" to be used in teaching and society (cf. Bayne, 2015; Erstad & Voogt, 2018; Lund & Aagaard, 2020). Rather, these entanglements reconfigure the conditions for democratic participation both within and beyond education. I therefore focus on how TEDs approach teaching student teachers to support young people's digital citizenship—their participation and engagement as citizens in contexts where citizenship and digital technologies are inseparable. These postdigital contexts shape the demands, challenges, and possibilities of TEDs' professional work.

This thesis contributes knowledge on how TEDs in social science TE approach teaching to teach for digital citizenship in postdigital contexts through four interconnected studies that explore, analyze, and discuss the following: theoretical conceptualizations of digital citizenship (Paper I), TEDs' qualitative views across different program areas of social science TE (Papers II–III), and national patterns in TEDs' views through mixed methods across all social science teacher education institutions (TEIs; Paper IV). Together, these studies contribute knowledge on how TEDs' professional characteristics and institutional arrangements shape their approaches to teaching to teach for digital citizenship, as elaborated through a specific aim and research questions later in this introduction.

In the following pages, I begin by establishing citizenship education's importance and TEDs' roles in preparing student teachers for such work. I then describe the context of social science TE given its key role for citizenship education, including the institutional arrangements within which these TEDs work. Finally, I introduce how digital technologies have become entangled with citizenship in postdigital contexts, which shapes the demands on citizenship education and, in turn, TEDs' professional work related to such teaching.

## Citizenship education in-the-making

While citizenship education has a long history globally and in Sweden, fostering democratic citizens has been a cornerstone of education systems particularly since World War II. When the extent of the horrors wrought by totalitarianism became clear, the United Nations codified that “since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed” (United Nations, 1947, p. 276; cf. SOU [Swedish Government Official Report] 1948:27). Over time, compulsory and upper secondary school have become central for citizenship education. These are formal education contexts where young people spend increasing amounts of time—for most, ten to thirteen formative years of their lives (Beach & Öhrn, 2011). TEDs bear a particular responsibility for citizenship education in these contexts, as they must ensure that future teachers develop the conceptual and practical knowledge needed for this work through purposeful teaching and learning activities (Raiker et al., 2019; Westheimer, 2022). This thesis draws attention to how TEDs approach such activities.

Schools' and TE's role in fostering democratic citizens are not mere philosophical ideas but institutional requirements. The European Union

(EU) key competences for lifelong learning include civic competences (Council of the European Union, 2018). The EU also targets citizenship education through its Democracy Action Plan and stipulates that Member States take relevant action, with TE playing a key role in the provision of well-trained teachers (European Commission, 2020; European Parliament, 2022; European Union, 2012). Similarly, across many national contexts, laws and steering documents for education codify the fostering of democratic citizens (Åstrand, 2020). The Swedish Instrument of Government states that “The public institutions shall promote the ideals of democracy as guidelines in all sectors of society” (SFS [Swedish Code of Statutes] 1974:152, Chapter 1, 2 §). Accordingly, the Swedish Education Act emphasizes schools’ role in fostering respect for democratic values (SFS 2010:800, 2010, Chapter 1, 4 §), which is recapitulated in the first chapter of national school curricula (Swedish National Agency for Education, 2018a, 2018b). The TE degree objectives<sup>2</sup> in the Higher Education Ordinance therefore require TEDs to develop student teachers’ capabilities to “communicate and instill” democratic values (SFS 1993:100). Consequently, both in schools and TE, nationally and across Europe, citizenship education is political through how it is addressed (Biesta, 2016).

Beyond these formal policy initiatives, there has been growing concern about citizenship education among policymakers and practitioners since the early 2000s. Osler and Starkey (2005) attribute this growth to questions about supporting young people’s democratic participation in times of rapid societal change. It coincided with declines in young people’s party affiliation and institutional trust, for example, which caused democratic concerns in many Western countries (Samaržija & Cassam, 2023). It is in this light that Swedish government-initiated democracy investigations partly can be understood with particular focus on young people (SOU 2000:1; SOU 2016:5). Against this backdrop, where democracy has regressed globally to 1985 levels and democratic crises unfold through digital infrastructures, the preparation of teachers for citizenship education has become crucial. It places demands both on teachers addressing citizenship in schools and, crucially for this thesis, the TEDs who prepare those teachers.

Although citizenship education is codified into institutional requirements, the concept of citizenship itself must be understood broadly within such

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<sup>2</sup> The Swedish Council for Higher Education refers to these as “qualitative targets” (Sw. examensmål), but for the sake of international publication of the articles and overall thesis consistency, the term “degree objectives” is used here. See <https://www.uhr.se/publikationer/svensk-engelsk-ordbok>.

institutional framings and in this thesis. While Marshall's (1950) influential conceptualization focused on legal relations between citizens and the nation-state, contemporary understandings recognize citizenship as something individuals both have and do. This involves dynamic relationships between individuals, society, and nation-states that encompass knowledge, skills, and values (Osler & Starkey, 2005; van Gunsteren, 1998/2018; Yuval-Davis, 1997). This reconceptualization acknowledges citizenship as constantly evolving, with claims for rights and resources grounded not just on the nation-state but global–local entities, technology, and biology, for example (Ong, 2006). Accordingly, citizenship and citizenship education in the EU area are multidimensional concepts comprising knowledge, skills, attitudes, and values oriented “towards the planet as a whole,” including digital technologies (European Parliament, 2022, p. 4; see later in this chapter).

For citizenship education, and particularly for this thesis, this broader understanding of citizenship is important for two reasons as highlighted by Biesta and Lawy (2006). First, it acknowledges that young people's citizenship is not the outcome of education; they already participate as citizens in society because “their lives are implicated in the wider social, economic, cultural and political world” (Biesta & Lawy, 2006, p. 73). This relational understanding highlights how citizenship is ongoing, in and out of education, but that education plays an important role in this regard (cf. Osler & Starkey, 2005). Second, this understanding critically challenges the instrumental, individualized focus on young people as not-yet-citizens and shifts it to citizens *always-in-the-making* (Biesta & Lawy, 2006). Building on the understanding of citizenship as relational and always-in-the-making, this thesis focuses on how TEDs approach citizenship education. Specifically, it analyzes how they approach teaching student teachers to foster democratic citizens in postdigital contexts. As discussed below, these are contexts where digital technologies are entangled with democratic participation, continuously reshaping what citizenship education entails.

Importantly, this thesis focuses on citizenship education not because this area lacks scholarly attention, but because TEDs' roles in preparing student teachers for this work remain underexplored (Pérez-Rodríguez et al., 2024). The importance of citizenship education itself is well established. As early as 1916, John Dewey (1916/1930) highlighted education's role in fostering citizens not merely for participation in a system of democratic governance, but for “a mode of associated living, of conjoint communicated experience” (p. 101): a broad understanding of

democracy, which also underpins this thesis.<sup>3</sup> Despite general scholarly consensus on the importance of educating democratic citizens, often with Dewey as a starting point (Sant, 2019), what this includes is continuously negotiated in educational research and policy (Biesta, 2003; Carr & Hartnett, 1996; Englund, 1986/2005, 2007; Gutmann, 2001; Labaree, 1997; Parker, 1996; Sant, 2019). This reflects how the meaning of democracy itself remains contested (Dahl et al., 2003; Samaržija & Cassam, 2023; cf. Gallie, 1955). In this evolving field, empirical research has often focused on school contexts, both in Scandinavia and internationally (e.g., Berge & Stray, 2012; Englund, 2007; Parker, 2002). In Swedish lower and upper secondary school contexts, examples of citizenship-related research foci include teachers and school students (Broman, 2009; Ekman, 2007; Larsson, 2007), teaching materials and teaching and learning in school subjects (Arensmeier, 2018; Broman, 2009; Wicke, 2019), discursive constructions (Carlbaum, 2012; Cooper, 2019; Olson, 2008), and school democracy (Bostedt & Eriksson, 2020; Eriksson, 2019; Rönnlund, 2011).

However, citizenship education in TE contexts, where TEDs prepare student teachers to foster democratic citizens, has received far less research attention both in Sweden and internationally, although recent years include important contributions (e.g., Edling & Mooney Simmie, 2020; Raiker et al., 2019). Aside from being considerably less voluminous, this literature often focuses on student teachers rather than TEDs who prepare them (Pérez-Rodríguez et al., 2024; cf. Forsström & Munthe, 2023; e.g., Bernmark-Ottosson, 2005; Edling & Liljestrand, 2018; Zyngier, 2016) unless non-empirical contributions are considered (e.g., Darling-Hammond, 2005; Westheimer, 2022; Zeichner, 2020). As shown below, this limited empirical attention to TEDs becomes even more evident when considering the TE program that prepares teachers for social science education, which is a school subject with a key role for citizenship education.

## Citizenship education in social science teacher education

Social science TE—a research focus that emerged over time in this doctoral project (see Methodology and methods chapter, p. 67)—has a long history of addressing citizenship education. As established earlier,

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<sup>3</sup> Compare with, for example, minimalist conceptions of democracy that essentially center on voter participation to elect representatives (e.g., Schumpeter, 1976).

TEDs in social science TE prepare student teachers to teach social science education in lower and upper secondary schools. This TE program leads to a subject teacher degree (Sw. *ämneslärarexamen*), distinct from the related program for civics teachers leading to a primary education teacher degree (Sw. *grundlärarexamen*), which combines social science with geography, history, and religion for students up to grade 7 (age 13). It is a multidisciplinary school subject that historically has drawn primarily on economics, sociology, and political science in different configurations (Bronäs & Selander, 2002; Larsson, 2024). This thesis focuses specifically on university-based TEDs teaching within social science TE, which involves 4–5.5 years of full-time study (240–330 ECTS), excluding alternative pathways. Within social science TE, TEDs teach social science student teachers how to teach citizenship subject content across multiple program areas.

Internationally, some school systems have overarching goals of fostering democracy and include several school subjects that contribute to citizenship education under various names and with different emphases (European Commission/EACEA/Eurydice, 2017; cf. Afana et al., 2024, p. 92; Barton, 2024). In some systems, citizenship education is cross-curricular and promoted through how school and schoolwork is organized (Børhaug, 2017). In Scandinavia, schools have an overarching responsibility to foster democratic citizens, with social science education playing a central role, while not the only one, in young people’s encounter with citizenship subject content (compare Sw. *samhällskunskap*, Da. *samfundsfag*, No. *samfunnsfag*). This configuration is not unique to Scandinavia, however. While no unified equivalent exists across countries, similar content appears in various subjects such as social studies, civics, and civic education (Larsson, 2024; Sandahl, 2015).

I argue in this thesis that social science TE is key to understanding an education system’s capacity to provide young people with citizenship education for participation in democratic life. This capacity depends on how citizenship education itself is conceptualized and enacted, as mere skill acquisition or as critical engagement with the conditions shaping education, democracy, and society more broadly (Paper I). Particularly important is how TEDs approach teaching student teachers to teach with attention to citizenship education. While courses on social science subject content have a central role (Papers III–IV), citizenship education is also part of the Core Education Subjects mandatory for all student teachers, including social science student teachers (Paper II). Together, these represent key program areas of social science TE where TEDs prepare student teachers for citizenship education.

## ***Social science TE and citizenship education: context and evolution***

Social science education was established after World War II with citizenship education as its core purpose, providing young people with knowledge to act as responsible, democratic citizens (Bronäs & Selander, 2002; Löfström & Grammes, 2020). Since then, the meaning of this provision, including knowledge, skills, attitudes, and values, has evolved with societal change, as have their didactic interpretation and emphases (Bronäs, 2003; Larsson & Ledman, 2023; cf. Campbell et al., 2012). This evolving character places dynamic demands on TEDs who must prepare student teachers for classroom realities they cannot yet predict, while maintaining social science education's democratic purpose within shifting institutional and political contexts (Åstrand, 2020).

These demands are amplified by TEDs' dual-didactic task. More specifically, TEDs must help student teachers to transform disciplinary content across multiple disciplines to the school context, for example, to develop young people's critical thinking skills on societal issues (Bronäs & Selander, 2002). While these are capabilities developed throughout teachers' careers, how TEDs teach teaching in social science TE lays the foundation by integrating content and practical knowledge (Bombardelli et al., 2021). This includes supporting student teachers' often difficult transition from being students of a discipline with highly specific domain knowledge, to subject teachers interpreting, enacting, and engaging young people in school curricula with generalized knowledge (Thompson, 2023). Given these evolving demands and the central role of social science TE in citizenship education, it is crucial to understand how TEDs navigate these challenges.

## ***An underexplored field: TEDs in multidisciplinary social science TE***

Despite TEDs' important role in preparing student teachers for citizenship education in social science TE, this is an underexplored field in TE research (Pérez-Rodríguez et al., 2024). This gap matters because each TED prepares hundreds of student teachers, who in turn teach thousands of young citizens. Systematic understanding is lacking, particularly in Nordic contexts, of how TEDs approach this preparation within the institutional arrangements of social science TE (Forsström & Munthe, 2023; cf. Lindblad & Lundahl, 2026; see also Strandler, 2023).

Even related research fields such as social science education research and subject didactics—where the latter shares this thesis's interest in

citizenship as subject content—are fragmented across disciplines, each approaching in its own way young people’s citizenship development (for a discussion on the Swedish context, see Sandahl, 2018). In these literatures, common empirical foci include textbooks, curricula, teaching methods, and evaluations of young people’s knowledge and conceptions of democracy (Bronäs, 2003; Löfström & Grammes, 2020), rather than TEDs. Sandahl et al. (2022) argue in their country report that the Swedish research base is particularly focused on upper secondary school social science education. Research examining citizenship education in social science TE across various national settings predominantly focuses on student teachers’ views (Pérez-Rodríguez et al., 2024; e.g., Cohen & Cohen, 2025; Eriksen, 2018; Patterson & Torsney, 2021), often locating challenges in student teachers rather than how conceptualizations they encounter in TE intersect with broader societal structures (Scott et al., 2022). Indeed, research in the Nordics and beyond shows that student teachers generally tend to have thin and apolitical understandings of democracy (Carr, 2012; Edling & Liljestränd, 2018; Zyngier, 2012), and social science TE is no exception (Eriksen, 2018). As schools mediate young people’s first-hand democratic experiences through teacher choices (Stray & Sætra, 2018), TEDs’ approaches to supporting broader democratic understandings warrant systematic investigation.

However, few studies have examined TEDs who are responsible for these encounters (e.g., Zyngier, 2012). Eklund and Larsson’s (2009) study is among the few Swedish empirical investigations into TEDs and citizenship education in social science TE. This lack of systematic understanding reflects broader international calls for research into competence needs in social science TE (Bombardelli et al., 2021).

This limited research attention is striking given social science TE’s distinctive challenges. The subject draws on multiple disciplines without a single academic counterpart, creating coordination complexities within Sweden’s decentralized governance model where TEIs interpret national degree objectives and enact program delivery with significant autonomy (Swedish Higher Education Authority, 2020). This governance model enables TEIs to organize programs differently and to draw on TEDs with diverse backgrounds (e.g., disciplinary training, academic rank, pedagogical experience) across Sweden’s 16 TEIs actively running social science TE programs (Johansson, 2017; see also Angervall et al., 2020; Strandler, 2023). Understanding how TEDs navigate these challenges within such diverse institutional arrangements is therefore crucial, given that their professional decisions influence the enacted pedagogy of social science TE (Loughran, 2007). This diversity in institutional arrangements

may shape approaches to citizenship education and could exacerbate cross-TEI equivalence concerns in social science TE program delivery (Swedish Higher Education Authority, 2020). As Korthagen et al. (2005) emphasize, “attention needs to be paid to the context of teaching about teaching and how the background, experience and understandings of practice impact the individuals responsible for teaching the next generation of teachers” (p. 111). This call remains relevant (Izadinia, 2014; Strandler, 2023; cf. Carpenter et al., 2024).

These institutional and individual conditions are further complicated by the fact that TEDs in social science TE work in a highly dynamic subject knowledge context. Social science subject content is, to a considerable degree, responsive to the societal context in which teaching and learning is situated: as society changes, subject content changes (Campbell et al., 2012; Sandahl, 2018), including such related to citizenship education. Shulman’s (1991) observation that “The only stability is change; the only certainty is flux” (p. 394) reflects this dynamic. Like teachers supporting school students, social science TEDs’ preparation of student teachers for citizenship education is temporally and spatially situated: teaching needs to be grounded in the present and the unknown future, co-evolving with democratic meaning and practice (Paper III). Citizenship education is therefore fluid at multiple levels, from the subject content addressed in teaching and learning to broader societal structures, such as forms of democracy (Castro & Knowles, 2015), institutions (Børhaug, 2017), and national curricula (Englund, 1986/2005). It is continuously renegotiated based on what society deems important that young people develop (Sandahl, 2015). It is in these highly dynamic contexts that TEDs in social science TE contribute toward responsive citizenship education through how they approach teaching student teachers to teach.

## Through a postdigital lens: digital citizenship

In the broader context of social science TE, one of the more striking examples of citizenship education’s evolving character is the increasing infusion of digital technologies over the past decades in society and education, reshaping how people participate and interact as citizens in democratic life (Isin & Ruppert, 2020). Citizenship has become inseparable from digital technologies: it is neither anchored in people’s place-based lives nor in the digital, and yet it is unimaginable without the digital (Hintz et al., 2019; Zuboff, 2019; Paper I).

As established in the introduction, to consider this evolving character of citizenship education, I adopt a postdigital lens in this thesis (Jandrić et al., 2018; see Theoretical framework chapter, p. 54). This lens has implications for understanding how citizenship emerges in messy sociotechnical environments—entanglements of humans, social practices, and digital technologies (cf. Fawns et al., 2023; Jandrić & Knox, 2022)—and for developing responsive subject content and pedagogies related to citizenship education. Across education levels, young people therefore need support to develop knowledge, skills, attitudes, and behaviors to act as citizens where the digital is an entangled dimension (Frau-Meigs et al., 2017).

Given these entanglements of digital technologies with citizenship, TEDs in social science TE need to prepare student teachers for digital citizenship education. What digital citizenship includes is the topic of ongoing discussions in the research literature (Richardson et al., 2021; Shi et al., 2023) and across multiple policy levels in Europe and globally (e.g., Burns & Gottschalk, 2019; Cosgrove & Cachia, 2025; Council of Europe, n.d.). Digital citizenship is thus fluid rather than a stable set of competencies, a contestation that intensifies as digital technologies become inseparable from democratic participation (McCosker et al., 2016). Concrete examples of what digital citizenship education can include are young people's societal participation and critical engagement with fake news, disinformation, and AI (Cosgrove & Cachia, 2025; Frau-Meigs et al., 2017). Particularly the latter has fueled discussions about generative AI technologies, both those deeply embedded in societal infrastructure and those that entered public consciousness with large language models such as ChatGPT and other AI applications (Giannakos et al., 2024; Markauskaite et al., 2022). The Swedish Internet Foundation (2025a) reports that by 2026, three in four young Swedes born 2000–2010 use AI technologies such as ChatGPT, and virtually everyone engages daily with algorithm-driven social media platforms. Among these, TikTok draws 78% of all upper secondary school students and, according to the Swedish Agency for the Media (2025), TikTok is their most frequently used news source despite their distrust of the platform. These shifts have far-reaching implications for citizenship education (Innerarity, 2024; cf. Council of the European Union, 2018), and for how TEDs teach student teachers how to teach in ways that support young people's citizenship with attention to AI (Carrillo & Flores, 2025; Mishra et al., 2025).

For TEDs in Swedish social science TE, these societal changes are reflected in institutional requirements, albeit without explicit reference to the term digital citizenship. For example, national school curricula are

essential steering documents for TEDs to consider given that these reflect student teachers' future professional context. The opening cross-curricular chapters require that all school staff support young people's capabilities to act in a complex reality with increasing digitalization. Social science subject content specifically includes digitalization related to democracy, with the broader goal of developing knowledge of how digitalization influences society (Swedish National Agency for Education, 2018a, 2018b).<sup>4</sup> Similarly, TE degree objectives require student teachers to demonstrate capabilities to “safely and critically use digital tools in pedagogical work” and “consider the role of different media and digital environments” for this work—demands which decentralized governance allows TEIs to further specify locally (SFS 1993:100).<sup>5</sup>

These institutional requirements demonstrate how Swedish education reflects a broader trend of increased emphasis on digital citizenship education in national curricula (Erstad & Voogt, 2018; Voogt et al., 2018) and social science education specifically (Erstad et al., 2021). This emphasis extends to education research and policy more broadly, most notably with digital competence requirements (Cosgrove & Cachia, 2025; Richardson et al., 2021). In this thesis, I argue that digital competence is foundational to digital citizenship, although these terms sometimes overlap in the literature (Pangrazio & Sefton-Green, 2021; e.g., Cosgrove & Cachia, 2025). This choice aligns with the EU's approach, where citizens' digital competence is a key competence involving “the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society,” where AI is an important aspect (Council of the European Union, 2018, p. 9; cf. European Parliament, 2006). It also aligns with emphases in education policies globally (Spante et al., 2018; cf. Krumsvik, 2014), including Swedish national curricula. This includes young people's development of digital competence to understand digitalization's implications for society, and to use and approach digital technologies responsibly and critically (Swedish National Agency for Education, 2018a, 2018b). This focus on digital competence stems from a longer history of Swedish school initiatives dating back to at least the 1960s, often driven by imaginaries of future society, citizenship, and societal participation—most recently including automation and AI (Rensfeldt & Player-Koro, 2020; Rensfeldt & Rahm,

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<sup>4</sup> One of these references refers to the 2018 revision of *Lgr11*, the curriculum for lower secondary school. This was in force when generating data for Papers II-III. In the fall of 2022, the subsequent *Lgr22* came into effect, which provided the backdrop for Paper IV. The new curriculum for upper secondary school, *Lgy25*, came into effect after all data generation was complete.

<sup>5</sup> For a comparative overview of digital competence policy in Nordic TE, see Lisborg et al. (2021).

2023; cf. Rahm, 2019). TE has accordingly had the task of providing teachers with relevant knowledge and skills (Gu & Lindberg, 2021).

## Teaching to teach with professional digital competence

Consequently, TEDs in social science TE need to prepare student teachers for digital citizenship education, which in this thesis I refer to as “teaching to teach for digital citizenship.” The preposition *for* in teaching for digital citizenship serves a two-fold purpose. First, it signals that the conditions for citizenship evolve with society, hence subject content and teaching to teach that content are in flux if education is to be responsive to the context in which it is situated. In other words, citizenship education is not fixed subject content that can simply be taught. Second, citizenship itself is not the end-product of citizenship education but something young people already have. Formal education can support its development and therefore has an important role, but young people always have the choice to reject what teaching and learning activities offer. This understanding of citizenship highlights teaching’s inherent uncertainty: we cannot teach digital citizenship—only *for* it (cf. Biesta, 2020; Biesta & Lawy, 2006).

To teach teaching for digital citizenship in line with these formal requirements, I take the view in this thesis that TEDs require *professional digital competence* (PDC), which is a competence that scholars across geographical contexts argue takes on characteristics distinctive to the TED profession (e.g., Foulger et al., 2017; Ottestad et al., 2014; Tømte et al., 2013; see Professional digital competence, p. 63). As with citizenship, there is general scholarly agreement that PDC is ever-evolving in response to the context in which pedagogical activities are situated (Almås et al., 2021; Carpenter et al., 2024; Johannesen et al., 2014; Lund & Aagaard, 2020; Skantz-Åberg et al., 2022). This evolving character requires integration of digital technologies within pedagogies rather than being add-ons to static educational practices (Farjon et al., 2019; Fischer et al., 2023). PDC supports TEDs’ dual-didactic task in relation to digital technologies, which is an area of TEDs’ profession that scholars identify as challenging yet underexplored (Lindfors et al., 2021; Pedersen et al., 2024; Røkenes et al., 2022; Uerz et al., 2018). TE research has long established that this dual-didactic task requires TEDs to be aware not only of their knowledge and skills regarding subject content and pedagogy related to citizenship education, but also to help student teachers engage with and “see into” such teaching practices, which goes beyond simply delivering subject content or passing on teaching tricks (Loughran, 2007;

Loughran & Menter, 2019). This requires a profession-specific competence that is neither innate nor the mere product of TED or schoolteacher experience but must be deliberately developed (Korthagen et al., 2005). This development is especially challenging because it often involves teaching in ways that TEDs themselves have not experienced as learners (Darling-Hammond, 2005; Krumsvik, 2014). TEDs need to explicate their teaching, “intentionally displaying certain teaching behaviour with the aim of promoting student teachers’ professional learning,” so that they can translate these experiences to their own teaching (Lunenberget al., 2007, p. 589). In their comparison with the training of new doctors, Korthagen et al. (2005) capture the challenges involved in TEDs’ dual-didactic task:

*being a teacher educator requires dealing with a complex dual role. Teacher educators not only have the role of supporting student teachers’ learning about teaching, but in so doing, through their own teaching, model the role of the teacher. In this respect, the teacher education profession is unique, differing from, say, doctors who teach medicine. During their teaching, doctors do not serve as role models for the actual practice of the profession, i.e., they do not treat their students. Teacher educators, conversely, whether intentionally or not, teach their students as well as teach about teaching. (p. 111)*

This dual-didactic task becomes increasingly complex in rapidly evolving postdigital contexts, requiring TEDs to draw on their PDC to both model and explicate pedagogical approaches for digital citizenship that they themselves may still be developing.

While the TE literature often refers to TEDs as teaching about teaching (Korthagen et al., 2006; Loughran, 2007), I use the phrase *teaching to teach* throughout this thesis, which signals an important distinction. It emphasizes TEDs’ active role in developing student teachers’ theoretical and practical capabilities to enact pedagogical approaches for citizenship education. In the thesis, this involves TEDs drawing on their PDC to develop student teachers’ capabilities to support young people’s digital citizenship. This draws attention to how TEDs approach teaching student teachers to teach for digital citizenship, not merely understand it.

To conclude this introduction, the development of young people’s democratic capabilities depends critically on the work of TEDs in social science TE. With postdigital challenges to schools’ role for democratic fostering and democracy at large, TEDs in social science TE programs across Sweden navigate institutional and professional conditions that

influence, through the student teachers they prepare, how the next generation can meaningfully participate in democratic life. Decentralized TE governance, multidisciplinary dynamics, and evolving social science subject content, together with diverse TED backgrounds and PDC, converge with rapidly shifting demands for digital citizenship education. This convergence places particular pressure on TEDs given the inherent temporal complexity of their work. Grounded in the present, TEDs must prepare future teachers who will themselves foster future citizens, all while moving toward “not-yetness”—the uncertainty about the societal challenges, school developments, and professional demands that these student teachers will encounter (Lindblad & Lundahl, 2026; cf. Ross, 2017). As distinctions between digital and non-digital continue to blur and democratic participation evolves in unpredictable ways, this temporal complexity becomes especially acute in postdigital contexts, where competencies involved in digital citizenship education are themselves in flux. It is therefore crucial to systematically and empirically understand how TEDs in social science TE approach teaching to teach for digital citizenship in postdigital contexts and how they draw on their PDC to navigate these challenges.

## Aim and research questions

The aim of this thesis is to contribute knowledge on how university-based TEDs in social science TE approach teaching to teach for digital citizenship in postdigital contexts. The purpose is to explore, analyze, and discuss the conditions for such teaching to become manifest. Specifically, the focus is on how TEDs approach such teaching within institutional arrangements with attention to content, professional roles, responsibilities, and capabilities to teach that content. This includes discussing implications for the enacted pedagogy of social science TE and responsiveness to the broader societal and educational postdigital contexts in which it is situated.

To address this aim, the thesis answers the following research questions (RQs):

1. How do conceptualizations of digital citizenship, as part of teacher educators’ professional digital competence, engage with the postdigital contexts in which social science teaching and learning is situated?

2. How are teacher educators' professional characteristics and institutional arrangements associated with their approaches to teaching for digital citizenship in postdigital contexts?
3. What are the implications for developing professional digital competence to teach for digital citizenship in social science teacher education in postdigital contexts?

I address these research questions through four interconnected studies that emerged organically as theoretical and empirical insights developed. Table 1 (p. 71) provides an overview of how each paper contributes to answering these questions. In Paper I, I establish the conceptual foundation by critically analyzing philosophical underpinnings of digital citizenship conceptualizations in the literature, operationalizing the postdigital lens that guides the empirical work (addressing RQ1 and RQ3). Paper II provides the empirical entry point into TEDs' work. I qualitatively explore views of teaching to teach for digital citizenship, related PDC, and implications for TEDs' role among TEDs teaching Core Education Subjects, the program area addressing citizenship education for all student teachers (addressing RQ1–3). The empirical insights from this study reinforced social science TE's long-established relevance for citizenship education, which prompted the focused qualitative study in Paper III. In this third study, I deepen the understanding of how TEDs in social science subject content courses view teaching to teach for digital citizenship, their PDC, and influencing conditions, both individual and institutional (addressing RQ1–3). The recurring patterns emerging across Papers II and III regarding professional characteristics and institutional arrangements warranted national-scale analysis for corroboration and further nuancing. This set the focus for Paper IV, where I explore TEDs teaching social science subject content courses through quantitative-leaning mixed methods across all 16 TEIs that prepare social science student teachers (addressing RQ1–3). Together, these studies progress from conceptual grounding through exploratory and focused qualitative analyses to comprehensive cross-institutional analysis, enabling both depth in understanding TEDs' approaches and breadth in identifying systematic patterns that shape social science TE's enacted pedagogy for digital citizenship education.

## Research contributions

This is a thesis in Educational work, which in Sweden is a distinct research subject within educational sciences through its practitioner-focused point of departure (Vinterek, 2023). Vinterek (2023) notes that it borders with

other sub-categories like subject didactics, for example, when it comes to citizenship. This bordering is tangible in the thesis given its shared attention to subject content in social science TE. According to Sandahl (2018), what characterizes social science subject didactics is a focus on all didactic questions (i.e., what, how, why, for whom) in specific teaching and learning contexts in social science education or higher education where such multidisciplinary perspectives are represented—in this thesis interpreted as social science TE. Without this multidisciplinary character, Sandahl argues, it becomes political science didactics, sociology didactics, etc. While I recognize the value of such a uniting approach, I argue, empirically through attention to TEDs within institutional arrangements, that social science TE program coordination and enactment is complex in ways that trouble such an approach to social science subject didactics. I do so by paying attention to, for example, organizational and professional characteristics, such as local TEI organization and TEDs' disciplinary background and PDC, and possible implications for social science TE program enactment.

This thesis thus shares an interest with and draws on insights from social science subject didactics regarding subject content with relevance to citizenship education. Yet by focusing on TEDs within institutional arrangements, it aligns more closely with TE research that Menter (2023) describes as directed toward the professional identity of TEDs insofar as it aims to “understand their work, their roles and responsibilities, and what are the factors that influence these” (p. 18). This thesis demonstrates that institutional arrangements provide structures for TEDs' work, but TEDs retain considerable professional decision space within these structures (cf. la Velle, 2023). TEDs actively navigate this space when interpreting and enacting teaching and learning in social science TE. Their decisions contribute toward shaping how the program addresses challenges like digital citizenship education, i.e., the enacted pedagogy of social science TE (Loughran, 2007). This analytical focus means that institutional arrangements are only the beginning to develop a wider understanding of how TEDs approach their work (Dinkelman, 2011). Echoing its overarching emergent design, the thesis contributes to this research field not by beginning with TEDs' professional identity but by exploring how they approach content, professional roles, responsibilities, and capabilities to teach that content, particularly PDC, across different social science TE program areas. From this, the thesis gradually increases the focus on TEDs' professional characteristics within institutional arrangements. Thus, this broad practitioner-focused TE research field harbors many foci and approaches, as exemplified by this thesis. It is to this field, within an empirically underexplored area of TE research in

general and social science TE specifically, that this thesis primarily contributes. Researchers in social science subject didactics, citizenship education, and education more broadly may also find its results of interest.

This thesis makes four interrelated contributions to two research areas: Educational work as a research subject, where TEDs is an understudied group (Svedberg & Granstedt, 2023), and TE research more broadly, where social science TE has received limited attention (Forsström & Munthe, 2023). First, *empirically*, as the first comprehensive study of digital citizenship in Swedish social science TE—and among the first systematic investigations of digital citizenship in Swedish education broadly—it demonstrates systematic patterns in how TEDs’ professional characteristics, especially disciplinary background and schoolteacher experience, are associated with their approaches to teaching to teach for digital citizenship and related PDC. This variation has implications for the preparation social science student teachers receive and equivalence, both within and across TEIs. Second, *methodologically*, the emergent research design moves from small-scale qualitative depth to national-level understanding, with the final mixed method study corroborating and nuancing qualitative patterns at scale across Swedish TEIs. This progression, from exploratory insights to systematic national patterns, is a distinct contrast to single-study designs common in research on TEDs and digital technologies. Third, *theoretically*, the thesis advances understanding of PDC for digital citizenship education through a postdigital lens. By analyzing existing conceptualizations of digital citizenship, it challenges instrumental approaches that treat digital technologies as neutral tools, instead showing how digital citizenship emerges from entangled sociotechnical relations. The thesis conceptualizes PDC as requiring in-flux qualities, including plasticity, temporality, and transformative agency, and reframes PDC as ecologically situated within shifting institutional and sociotechnical contexts.

Together, these empirical, methodological, and theoretical contributions provide a comprehensive understanding of how TEDs navigate the intersection of professional characteristics, institutional arrangements, and rapidly evolving societal demands. The results have important implications for policy and practice, which take on particular urgency given Swedish policy developments in the 2020s, detailed in the Background chapter. Such policy shifts make preparation for digital citizenship increasingly contingent on institutional arrangements. This contingency means assumptions about program coordination in decentralized Swedish TE, particularly in multidisciplinary social science

TE, need reconsideration, including how disciplinary structures respond to postdigital contexts. Ultimately, these dynamics have ripple effects from TE classrooms to how schools support young people's democratic participation in postdigital contexts.

## Structure of thesis

This compilation thesis comprises two parts: (i) a seven-chapter summary and synthesis of the research reported in this thesis, and (ii) the four papers included in this thesis.

The first part began with this chapter, which introduced the thesis. *Background* focuses on the historical context for the thesis. *Previous research* addresses research relevant to this thesis. *Theoretical framework* presents the theoretical framework for this thesis, particularly the postdigital lens and TEDs' PDC. *Methodology and methods* presents the overarching emergent research design of this thesis, the four studies reported in Papers I–IV, and reflections on ethical considerations and methodological issues. *Summary of papers* describes the key results across Papers I–IV. *Analysis and discussion* reiterates the aim of the thesis and the three overarching RQs, then answers these by synthesizing the results across Papers I–IV in relation to the broader literature on TEDs' work, PDC, and digital citizenship. Concluding remarks articulate the thesis's empirical, methodological, and theoretical contributions to TE research, with implications for policy and practice and suggestions for future research.

The second part includes Papers I–IV. Reflecting the thesis's emergent design, Paper I provided the conceptual foundation, while Papers II–III offer progressively focused empirical insights that established the basis for Paper IV's national analysis. Throughout this and subsequent chapters, references to these papers identify where empirical results, theoretical insights, or methodological considerations from the studies are relevant to the discussion at hand.

# Background

In this chapter, I describe the context within which TEDs in Sweden approach content, their professional roles, responsibilities, and capabilities for preparing social science student teachers for digital citizenship education. Understanding this context requires examining both the institutional landscape of social science TE, shaped by historical development, governance reforms, and contemporary organizational challenges. It also requires examining the conceptual and policy landscape of digital citizenship in Swedish education, from its emergence in international research to recent policy pushback in the Swedish context. Together, these dimensions establish the conditions within which TEDs approach their dual-didactic task of teaching to teach for digital citizenship in postdigital contexts.

## Social science teacher education: historical foundations

### ***Post-WWII democratic mandate and teacher college establishment***

Social science education was established after World War II as part of the broader democratic mandate to prevent future totalitarianism through education. In Sweden, the 1946 School Commission proposed that social science education be the primary subject for citizenship education (SOU 1948:27). Early 1900s' citizenship education had been class differentiated regarding content and school forms. In secondary schools, mainly open to the middle and upper classes, the school subject history had carried a strong responsibility for citizenship education in the years leading up to World War II. However, the subject's nationalist underpinnings emerged as *passé* after the war. Social science education was therefore established to provide young people with knowledge to act as responsible, democratic citizens (Bronäs, 2003; Bronäs & Selander, 2002; Larsson, 2024; Sandahl, 2015). The government's subsequent implementation of this proposal was part of broader progressive reform to sustain democracy by establishing a cohesive, research-based school for all young people regardless of class (Larsson, 2024).

The 1946 Commission's proposals required well-prepared teachers, hence the Commission's work also laid the foundation for teacher colleges (Sw. *lärarhögskolor*; SOU 1952:33). The government's establishment of

teacher colleges initiated the first of several TE reform cycles with implications for social science TE (Åstrand, 2006).

### ***Academization and integration into higher education***

For social science TE's development, key pivotal points include: the 1956–1977 establishment of teacher colleges, the 1977 Higher Education Reform, the 1993 Higher Education Reform, the 2001 and 2011 Teacher Education Reforms, the 2011 Autonomy Reform, and the forthcoming 2028 TE reform (see Figure 1, p. 41). These reforms reshaped TE governance and the conditions under which TEDs work.

The 1956–1977 establishment of teacher colleges built on previous academization trends in TE programs. Globally, schooling had become more systematized from the late 1800s onwards, which organized, academized and, later, expanded TE. From early apprenticeship models where student teachers observed experienced teachers, TE increasingly became linked to educational sciences to promote a deeper understanding of teaching and learning (Menter, 2023; cf. Elstad, 2023). In Sweden, this academization process involved merging two distinct institutional traditions through the teacher colleges: the seminar TE tradition for preparing teachers of younger school students and the academic tradition of subject student TE. With all seminars having transformed into teacher colleges by 1968, this merger effectively strengthened TE's research base (Lindblad & Lundahl, 2026; Åstrand, 2006).

This shift toward increasingly organized TE reflected a global expansion of higher education after World War II, driven by convictions about the importance of a well-educated population for flourishing societies (Schofer & Meyer, 2005). In Sweden, these trends heralded a new TE reform cycle with the 1977 Higher Education Reform (Prop. [Government Bill] 1976/77:59). This reform established the Higher Education Law and the Higher Education Ordinance. These new regulations shifted responsibility for TE away from the Royal Board of Education (Sw. *Kungliga skolöverstyrelsen*) and integrated it into higher education, and they brought all higher education institutions under one legal framework (Åstrand, 2020; Hellberg & Backvall, 2025; Lindblad & Lundahl, 2026). This academization of TE has continued since (Elstad, 2023; Gustafsson et al., 2016).

# From central state control to institutional autonomy

## ***The 1993 Higher Education Reform***

Up until 1993, Swedish higher education governance was largely centralized at the state level, but the 1993 Higher Education Reform (sometimes called the “Freedom Reform”) decentralized this governance (Prop. 1992/93:1). TEIs had recently been assigned responsibility for teachers’ professionalism (Prop. 1990/91:18, p. 21). The 1993 reform granted them autonomy to decide on internal organization, resource allocation, program dimensions, and on content and organization of studies based on national degree objectives stipulated in the Higher Education Ordinance. This included per-capita funding and accountability mechanisms as the reform transferred responsibility for quality education to the higher education institutions (Karlsson et al., 2017; Swedish National Agency for Higher Education, 2006; Åstrand, 2006). Sweden was not alone in grappling with such changes. Similar tensions between institutional autonomy and state control have characterized Nordic higher education reforms since the 1990s, though the countries have navigated these tensions differently (Hellberg & Backvall, 2025).

## ***The 2001 Teacher Education Reform***

The 2001 Teacher Education Reform further decentralized TE by establishing a new legal framework. Through significant autonomy, TEIs and TEDs could shape content in the newly introduced Core Education Subjects and across other program areas, including subject specializations and practicum (Åstrand, 2006).

This reform brought further decentralization and a shift in the scientific knowledge base for TE. Where pedagogy had traditionally served as the primary disciplinary foundation for TE research, state directives required TEIs to establish special boards (Sw. *särskilt organ*) with responsibility for TE programs and TE related research within educational science—a new broader area encompassing research with relevance for education carried out in various disciplines (SOU 1999:63, pp. 275, 370). In parallel, the Swedish Research Council established the Committee for Educational Science (Prop. 1999/2000:135). The purpose was to strengthen the scientific base for TE which would happen through subject didactics. This made the boundaries of educational science more porous, challenging its role as the primary disciplinary foundation for TE research and practice.

As a result, power dynamics shifted to the subject disciplines while TE underwent a broader re-traditionalization (Beach & Bagley, 2012, p. 297; see also Kallós, 2009; Lindblad & Lundahl, 2026).

Some scholars argue that this decentralization also exacerbated incentive structures within TEIs. For example, Säfström and Saeverot (2017) claim that with educational sciences' increasingly porous boundaries around TE research, and with the 1990s' introduction of per capita funding, TE courses became valuable institutional resources that significantly challenged the professional base in Swedish TE (cf. Papers II–III).

### ***Autonomy and accountability: the 2011 reforms***

These steps toward decentralization continued with the 2011 Autonomy Reform for higher education (Prop. 2009/10:149). The reform aimed to adapt Swedish higher education to international trends while strengthening institutional autonomy. Universities and university colleges gained greater control over local organization and teacher recruitment to function as independent forces for critical thinking and societal development, though the state maintained quality control mechanisms given substantial public funding (Hellberg & Backvall, 2025). This reform increased autonomy for TEIs to organize TE programs and program content based on the national degree objectives. For example, since the reform TEIs have been able to decide on local requirements beyond the national degree objectives if wanted (SFS 1993:100).

However, this increased autonomy for TEIs in organizing TE occurred alongside greater regulation of TE itself. Content and forms have become more regulated through central ordinances, particularly the Higher Education Ordinance (SFS 1993:100). This is especially evident within the program area Core Education Subjects (Åstrand, 2020). Together with this Ordinance, several laws and regulations act as steering documents for TE programs, including the Higher Education Act (SFS 1992:1434), Ordinance on Education for Teachers and Preschool Teachers (SFS 2021:1335), and Ordinance on Admission to Education Leading to a Vocational Teacher Degree (SFS 2010:2021).

While Swedish TE has become increasingly academic since the 1980s as described above, the 2011 TE Reform marked further academization (Prop. 2009/10:89; SOU 2008:109). It aimed to address implementation issues from the 2001 TE Reform and to ensure better alignment between TE program delivery and the professional context awaiting student

teachers (Lindblad & Lundahl, 2026). Among other changes, the 2011 TE reform regulated the number of TE programs to four, leading to different professional degrees such as subject TE (240–330 ECTS).

The 2011 TE reform manifested how TE responsibilities continued to transfer from central places of TEI coordination within universities to subject disciplines following the 2001 TE reform (Beach & Bagley, 2012; Gustafsson et al., 2016). While this reform increased emphasis on TE regulation, it created tensions in practice. Audits and scholars identified implementation challenges, such as systematic program inconsistencies continuing across TEIs (Swedish Higher Education Authority, 2020) and inadequate TE competence among TE program coordinators (Gustafsson et al., 2016). Moreover, the significant level of autonomy for TEIs continues to pose risks regarding how equity and equality are ensured within and across TEIs. Regulation requires that higher education closely connect research and education, yet TEIs continue to have different research resources and thus vastly diverse conditions for program quality and enactment (Åstrand, 2020; cf. SFS 1992:1434, chap 1, 3 §). These challenges persist both at the level of TE program coordination and implementation across TEIs.

This variation in program content reflects Sweden’s influence from the continental European *Didaktik* tradition in education where professionals with significant autonomy interpret and enact curricula. As Hudson (2002) observes, “curriculum is interpreted and given life” (p. 45) by “self-determining *professionals* who work within a larger institutional framework that directs, but does not control, the details of their work” (p. 47, emphasis in original). This tradition differs from the curriculum tradition common in the English-speaking world, where steering documents like national curricula more extensively regulate education’s content, goals, and instructional procedures to attain those goals (Friesen, 2018; Hudson, 2002).<sup>6</sup>

In Sweden, this larger institutional framework operates through multilevel governance, where education policy emerges through complex interplays among diverse actors across multiple governance levels, shaping what is addressable, how, and when (Jarl & Rönnerberg, 2019). For TEDs, this means interpreting and enacting national degree objectives locally within specific institutional arrangements. Consequently, how

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<sup>6</sup> Reflecting this *Didaktik* tradition, Swedish schoolteachers report among the highest perceived levels of autonomy to interpret and enact curricula among the OECD countries (OECD, 2025).

TEDs approach teaching to teach for digital citizenship cannot be separated from the policy dynamics shaping their work.

The 2011 Autonomy Reform also affected TEDs' formal qualifications. The reform lifted requirements on formal pedagogical qualifications for the appointment of lecturers, enforced between 2003–2011 (Karlsson et al., 2017). While the Swedish Higher Education Authority later tasked the Association of Swedish Higher Education Institutions with developing guidelines in this regard, no formal requirements yet exist. Thus, Swedish higher education hiring processes require consideration of scientific competence and pedagogical skill for lecturers and professors, but no such formal requirements exist for other teachers that social science student teachers may encounter (SFS 2010:1064). Moreover, lecturers' and professors' pedagogical skill requirements typically concern higher education pedagogy (15 ECTS) and vary across TEIs. Like higher education teachers generally in Sweden, TEDs may have vastly different pedagogical capabilities, ranging from backgrounds in school teaching to TE research and teaching (Angervall et al., 2020; Strandler, 2023), and represent different disciplines and academic ranks.

For social science TE specifically, these reforms have meant significant autonomy for TEIs and TEDs to interpret and design TE programs based on national degree objectives. TE programs may therefore vary locally not only in terms of organization, structure, and content (Papers II–III), but also in TED backgrounds and pedagogical approaches (Papers III–IV). As I discuss later in this chapter, a new TE reform—the 2028 TE Reform—was initiated in 2023 (Dir. [Committee Terms of Reference] 2023:111; SOU 2024:81), suggesting that these conditions of decentralization, TE content, and local variation continue to be subject to policy consideration.

## Social science teacher education in decentralized governance

### ***Distinctive disciplinary characteristics***

The organizational autonomy described above has implications for social science TE. All TE programs vary locally to some degree, yet social science TE's variation may be amplified by the subject's distinctive characteristics when combined with TEIs' considerable autonomy to organize program content. While social science education's democratic purpose has remained, the didactic interpretation of this aim has shifted (Larsson & Ledman, 2023; see Bronäs, 2003 for an overview), reflecting the subject's

inherently fluid character. This fluidity stems in part from the political decision to create social science education by drawing on several disciplines rather than allowing a single discipline with established traditions to develop it organically. Consequently, social science content, organization, and emphases have varied over time (Bronäs & Selander, 2002).

This multidisciplinary character of social science TE makes TEDs' dual-didactic task particularly challenging. TEDs must support social science student teachers both in learning subject content across disciplines and in transforming that content into teaching and learning in secondary school contexts (Bronäs & Selander, 2002; cf. Murray & Male, 2005). Moreover, given social science education's societal function to promote among young citizens knowledge and skills to navigate and participate in temporally and spatially specific contexts, social science content is inherently a moving target (cf. Campbell et al., 2012; Sandahl, 2018).

These characteristics create particular organizational challenges for social science TE. Social science education is a relatively young school subject with no academic counterpart. The school subject draws primarily on economics, sociology, and political science (Bronäs & Selander, 2002; Larsson, 2024; Löfström & Grammes, 2020). As Swedish TEIs exercise significant autonomy over how they organize social science TE programs, the disciplinary representation in TE does not necessarily align with the school subject's disciplinary balance. While some scholars argue that this multidisciplinaryity is an opportunity rather than a problem (Blanck & Löden, 2018; Sandahl, 2018), it compounds common challenges to establishing links between subject content and teaching and learning throughout social science TE (Bombardelli et al., 2021; cf. Lunenberg et al., 2007). These challenges are particularly significant for citizenship education, which requires drawing connections across disciplines to support young people's participation in democratic life (cf. Davies & Dunnill, 2006; Thompson, 2023). For TEDs, this means helping student teachers translate several disciplinary knowledges into classroom practice for citizenship education. This task matters for understanding TEDs' work in this thesis. The organization of knowledge in higher education shapes student teachers' opportunities in social science TE to develop capabilities integrated across disciplines and relevant for their future practice (Barton, 2024; Eklund & Larsson, 2009; cf. Markauskaite et al., 2023). Consequently, how TEDs navigate these organizational challenges can have ripple effects on young people's citizenship education through the student teachers they prepare.

### ***Program structure and institutional variation***

In Sweden, 27 TEIs prepare subject student teachers to teach either lower secondary school (ages 13–15) or upper secondary school (ages 16–19). Of these, 19 have degree-awarding powers in social science TE, with 16 actively running programs (Paper IV). These programs share essentially the same degree objectives with only minor additional requirements for upper-secondary school teachers. Student teachers graduate with a Degree of Master of Arts/Science (4–5.5 years of full-time study, 240–330 ECTS). The degree typically comprises Core Education Subjects (1 year of full-time study, 60 ECTS), two subject specializations, subject didactics, and practicum. Core Education Subjects focus on knowledge relevant to all teachers regardless of subject specialization.

For TE programs broadly and social science TE in particular, the decentralized governance model allows considerable variation in how these components are organized. For example, the first semester of Core Education Subjects typically includes a module on education and democracy that focuses on schools' role for democracy (5 weeks of full-time study, 7.5 ECTS). TEIs can organize this module cohesively (i.e., full-time studies over five weeks) or address it in different parts of TE (Åstrand, 2020; cf. Paper II). Additionally, TEIs can either embed subject didactics in courses covering subject matter or address it in separate courses studied in parallel with subject matter (Paper IV). Such structural variation shapes when and how student teachers encounter content related to digital citizenship, as this content might appear in Core Education Subjects, subject didactics, courses on subject content, or be distributed across all three. This flexible structure, combined with social science TE's multidisciplinary character and the autonomy TEIs have in program design, creates conditions where variation in how TEDs approach teaching to teach for digital citizenship can emerge both within and across TEIs.

### ***Coordination challenges across institutions***

Nevertheless, TE is one of Sweden's more regulated higher education programs, for example through its many degree objectives. At the same time, the decentralized model of higher education governance grants TEIs and TEDs considerable autonomy to interpret and organize social science TE and program content around those very degree objectives (Lindblad & Lundahl, 2026; Swedish National Agency for Higher Education, 2006; cf. Prop. 1992/93:1). This governance model shapes how TEDs within institutional arrangements approach teaching to teach in ways that address citizenship education, though the model is not tension-free.

Among its effects are program content inconsistencies across TEIs (Swedish Higher Education Authority, 2020) and tensions regarding what social science TE should include among the contributing disciplines. Despite the Swedish government's emphasis on program quality and national consistency specifically for TE (Skr. [Government written communication] 2015/16:76, p. 16), both studies and reports highlight needs for stronger program cohesion within and across TEIs (Johansson, 2017; Swedish Higher Education Authority, 2020).<sup>7</sup> This reflects general challenges of subject TE program coordination, which include coordination across faculties, departments, subjects including subject didactics, and a large number of TEDs with fragmented teaching responsibilities—challenges that require special organizational conditions to ensure program cohesion (Kindberg et al., 2023).

Although political science has a strong presence across Swedish TEIs organizing social science TE (Johansson, 2017), TEIs embody diverse institutional arrangements with TEDs representing various disciplines, subject traditions, and epistemologies. As Davies and Dunnill (2006) and Eklund and Larsson (2009) show, social science TE's less well-established identity and interdisciplinary dynamics can result in citizenship education privileging different disciplinary perspectives and epistemologies. This creates incongruence between what student teachers encounter in social science TE and what they need to teach the school subject.

In social science TE specifically, such coordination challenges are compounded by the multidisciplinary character established earlier. This creates tensions around how to divide and integrate disciplinary contributions (Bombardelli et al., 2021). These tensions manifest in local TEI organization where TEDs from different disciplines teach social science TE (Papers III–IV). This multidisciplinaryity, combined with the significant autonomy that TEIs and TEDs have in interpreting national degree objectives, means that how digital citizenship is conceptualized and addressed may vary considerably across institutions (Papers II–IV). TEDs from different disciplinary backgrounds bring distinct epistemological perspectives to questions of digital technologies, democracy, and citizenship education. These differences risk becoming amplified by the decentralized governance model that places responsibility for program content and enactment with TEIs and, ultimately, individual TEDs. As described above, these coordination

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<sup>7</sup> In the Swedish Higher Education Authority's 2016–2020 national audit of social science TE, five of 22 programs received criticism, of which four improved within the following year and one was discontinued (Kindberg et al., 2023).

challenges are potentially complicated by the incentive structures established by the 2001 TE Reform, where institutional competition for TE courses can both challenge TE's research base and pedagogical considerations about program delivery (Säfström & Saeverot, 2017).

This institutional variation in how social science TE is organized extends to variation among TEDs themselves. Globally, paths toward becoming a TED vary considerably (Cochran-Smith et al., 2020). As Menter and Loughran observe (2019), “In many ways, who a teacher educator is, and what the role entails, is influenced by the context in which the work occurs” (p. 217). In social science TE, TEDs represent different backgrounds in terms of academic rank (e.g., adjunct<sup>8</sup>, lecturer, professor), discipline (e.g., education, political science, sociology), and experience ranging from predominantly TE based to recent school teaching (Papers III–IV). National subject TE program audits have identified challenges with professional competence enacted by non-permanent staff and notable lack of TEDs with schoolteacher experience (Kindberg et al., 2023). This variation in expertise and experience, together with resource constraints, shapes the institutional arrangements within which TEDs approach teaching to teach for digital citizenship. These dynamics risk becoming amplified in decentralized, multidisciplinary social science TE, where, as Loughran (2007) highlights, TEDs' decisions influence the enacted pedagogy of TE.

### ***Resource constraints and competing pressures***

Resource constraints further complicate these organizational challenges. Swedish TE has seen funding decrease since the 1980s (Gustafsson et al., 2016). The per-capita funding model is tied to student enrollment and course completion. The funding system allocates different levels to 16 higher education areas, with the two most relevant to social science TE—education and humanities/social sciences/theology/law—among the lowest funded per student (Swedish Association of University Teachers and Researchers, 2024; Swedish Higher Education Authority, 2024; cf. Government Decision U2025/00736). This funding model has significantly influenced how TEIs distribute resources and approach program delivery. Moreover, teaching duties for all higher education teachers have intensified (Karlsson et al., 2017) while TEDs have significantly fewer teaching hours with students compared to colleagues in other programs, well below the European average (Hauschildt, 2024;

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<sup>8</sup> In Sweden, an adjunct (sometimes referred to as “assistant lecturer”) is a TED without a PhD whose responsibilities mainly include teaching.

Hwang, 2023). This situation challenges TEDs' possibilities of delivering on the high expectations ascribed to social science TE (cf. Darling-Hammond, 2005), echoing a general lack of resources for addressing democracy across European TE programs (Raiker et al., 2019).

### ***Crisis discourse and neoliberal pressures***

While social science education's role in citizenship formation has remained central, scholars have debated whether the subject has been undergoing a "crisis" since the early 2000s (Blanck & Löden, 2018; Bronäs & Selander, 2002; Sandahl, 2015). This crisis discourse concerns a broader discursive shift from a *for-public-good approach* to schools toward a neoliberal, depoliticized *knowledge-as-goods approach*, which has challenged social science education's democratic purpose (Gustavsson, 2014; cf. Labaree, 1997). Examples include international benchmarking, increased accountability, and school choice that have emerged alongside a de-emphasis on the democratic role of schools in Scandinavian contexts since the 1990s (Hultén et al., 2022). Despite these trends, citizenship education remains present in Swedish national curricula, particularly in social science education (Arensmeier, 2024). These neoliberal trends have coincided with a broader shift in society from viewing the state as the ultimate authority to democracy as a norm. Together, these developments challenge teachers' capabilities to plan and enact relevant citizenship education activities in classrooms (Christensen, 2011).

These tensions cascade into social science TE, where TEDs navigate historical contexts, present realities, and uncertain futures simultaneously (Åstrand, 2020). TEDs must sustain social science education's democratic purpose amid institutional pressures while preparing student teachers for classroom realities they cannot yet predict. As Åstrand (2020) observes, "Society's problems are the school's problems. And the school's problems are also teacher education's problems" (p. 114, my translation)—a recursive relationship long recognized as central to TEDs' work (Lunenberget al., 2007).

## **Digital citizenship: conceptualizations and policy contexts**

Having established the institutional landscape of Swedish social science TE, I now turn to how digital citizenship has emerged as an educational priority and its presence in Swedish education policy. I examine digital citizenship's conceptual foundations and policy developments that shape

TEDs' PDC for teaching to teach for digital citizenship in social science TE. Given the interdisciplinary interest in digital citizenship, I begin by examining how digital citizenship has been conceptualized across disciplinary boundaries and within educational research, then trace how these ideas have manifested in Swedish education policy from expansion to recent policy pushback. Steering documents for education have seldom featured the concept of digital citizenship explicitly. However, they have built on the recognition that digital technologies have become increasingly important for how citizens engage in democratic life, hence why young people need to develop certain knowledge, skills, attitudes, and values in schools.

### ***An interdisciplinary field***

Relations between democracy and technology have deep historical roots, from ancient Greek associations of craft-related knowledge with labor (Vallor, 2022), to the Frankfurt School's critical examinations of technology as an instrument of domination and social control (e.g., Horkheimer & Adorno, 2002; Marcuse, 2013; see also Delanty & Harris, 2021). However, the specific character of digital technologies' increasing entanglement with citizenship prompted renewed attention in the 1990s. While scholarship examined how digital communication infrastructures were restructuring social relations and democratic participation (Castells, 1996), popular discourse increasingly embraced optimistic narratives about digital technologies' democratic potential (Dahlgren, 2018; Dumbrava, 2017).

Reflecting this optimism, a 1997 WIRED article by Jon Katz introduced what may be the first recorded use of the term "digital citizen," calling for attention to how the internet impacted the conditions for democracy and citizenship. Described as "deeply democratic" and characterized by trust in the internet, digital citizens were the frequent users of technologies such as laptops and pagers (Katz, 1997, Apart from the Crowd section, para. 3). This zeitgeist reflection of democratic optimism came under fire toward the end of the 1990s. Growing critique highlighted unfulfilled democratic expectations and digital divides along who had access to digital technologies and the skills to use these for democratic participation (e.g., DiMaggio & Hargittai, 2001; Norris, 2003; van Dijk & Hacker, 2003; see also Örtengren, 2024a). While digital citizenship as a concept emerged in the 1990s, digital technologies' presence in education has a longer history. In Sweden, state-initiated reforms to incorporate digital education curricula began in the 1960s (Rensfeldt & Player-Koro, 2020; see also Rahm, 2019) and then continued through the 1970s with

computer-based education in schools. As Gu and Lindberg (2021) show, such developments formed a pattern where TE is expected to respond to shifting technological and policy landscapes. This pattern continued through the 1990s school reforms, which introduced digital competence expectations alongside neoliberal restructuring (Prop. 1992/93:1), and the 2010s digital competence policy developments described below.

Since these turn-of-millennium developments, digital citizenship has grown into an established interdisciplinary research field which explores the implications of digital technologies' entanglement with citizenship. While there is no universally adopted definition of digital citizenship, conceptualizations typically include skills, knowledge, attitudes, and behaviors (Frau-Meigs et al., 2017). The interdisciplinary interest in digital citizenship is manifest in, for example, recent years' literature reviews. These have mapped theories and empirical research in the social sciences broadly (e.g., Jæger, 2021; Jørring et al., 2018) and education specifically (e.g., Estellés & Doyle, 2025; Richardson et al., 2021; Shi et al., 2023).

Approaches in the social sciences beyond education have connected digital citizenship to political participation and influence in society through access to digital technologies (e.g., DiMaggio & Hargittai, 2001; Mossberger et al., 2007) and through the development of specific competencies (Lindgren, 2017). Digital citizenship thus becomes something citizens do and digital technologies “a means for citizenship-making and democracy” (Rahm, 2019, p. 37). Other approaches caution against over-emphasizing technical skills by stressing how digital infrastructure restructures social relations and practices (e.g., Couldry et al., 2014; Hintz et al., 2019). Importantly, this literature does not frame digital citizenship as limited to a “digital” sphere but transcending online–offline binaries. Citizens act as subjects through sociotechnical relations where digital technologies are a part, and, at the same time, establish and shape those relations (Isin & Ruppert, 2020). This perspective aligns with the postdigital lens adopted in this thesis to examine such entanglements rather than treating digital and analog as separate domains.

The focus on digital citizenship has grown in the new millennium, reflecting how citizenship and participation in society have become inherently linked (Dumbrava, 2017; Lindgren, 2017). Algorithmic oppression (Noble, 2018), data surveillance capitalism (Zuboff, 2019), digital Taylorism in the workplace (Rogers, 2023), fake news and AI-generated content (Cosgrove & Cachia, 2025; Frau-Meigs et al., 2017)—in myriad ways, digital technologies' infusion in societal contexts is

reconfiguring how people think and act as members of society and how these developments are conceptualized and understood (Hintz et al., 2019; cf. Paper I). While the democratic challenges associated with these developments are not new, technologies such as AI intensify them in unprecedented ways by reconfiguring the epistemic basis for citizens' ability to make informed decisions (Coeckelbergh, 2025; Innerarity, 2024). Generative AI can produce convincing but fabricated content at scale (Simchon et al., 2024), while recommendation algorithms shape what information citizens encounter, contributing to an "epistemic crisis" characterized by information cacophony, fragmented attention, and weakened public agency (Dahlgren, 2018, p. 20). As people increasingly delegate decision-making to AI systems, from information curation to advice-seeking, questions arise about maintaining human autonomy. Yet this capacity for autonomous decision-making is unevenly distributed across society and shaped by sociotechnical environments (Carroll et al., 2024; Floridi et al., 2018).

These examples are not uniform along the national borders of highly digitalized countries such as Sweden and its Nordic neighbors, which are some of the most advanced digital economies in the EU (European Commission, 2025a). Rather, Sweden exhibits within-country digital divides across social groups (Fraillon, 2024; Iacobaeus et al., 2019; Swedish Internet Foundation, 2025a). For example, young Swedes feel particularly uncertain about the future with AI-driven changes in the labor market (Swedish Youth Barometer, 2025)—uncertainty grounded in rapid AI adoption among Swedish enterprises, which increased 10 percentage points in one year to reach 35% in 2025 (Statistics Sweden, 2025). At the same time, AI technologies have become integrated into young people's daily lives. Three in four Swedes born in 2000–2010 report using AI for tasks ranging from health advice to text processing (Swedish Internet Foundation, 2025a). Beyond individual engagement, AI development and deployment require data centers that may have climate effects far beyond their local or national context, and the training of AI models may be outsourced to the Global South (cf. Emejulu & McGregor, 2019; Selwyn, 2022). Digital technologies' implications for citizenship thus extend beyond national contexts, raising questions about how education systems globally prepare young people to navigate these complexities as democratic citizens.

### ***Educational approaches and frameworks***

While social science perspectives have established digital citizenship's broader societal significance, educational research has developed

approaches for operationalizing digital citizenship in teaching and learning contexts, with a marked growth in interest particularly from 2015 (Richardson et al., 2021; Shi et al., 2023).

Given this interdisciplinary landscape, the boundaries of digital citizenship research in education remain porous. Scholars across disciplines explore related concepts and fields (e.g., digital competence, media and information literacy) that both inform and draw on digital citizenship literature, for example through digital citizenship as an important aspect (e.g., Löfving, 2025; Nagel, 2023), through conceptual reference without definition (Jæger, 2021), or through topical relevance albeit without engaging with this literature. Among Nordic approaches (Godhe, 2019), examples of such adjacent scholarship includes digital source evaluation and epistemic beliefs (e.g., Carlsson & Sundin, 2018; Nygren et al., 2021), AI literacy (e.g., Velandar et al., 2024, 2026), and digital responsibility (also “digital judgment” or “digital Bildung”) particularly in the Norwegian context (e.g., Krumsvik, 2011; Nagel, 2023). I therefore follow Richardson et al.’s (2021) restrictive approach below, focusing on research that explicitly links to the field of digital citizenship to establish clear conceptual foundations.

With links particularly to the American context (Richardson et al., 2021), a large category of approaches to digital citizenship in education focuses on responsible use of digital technologies. One of the early and most cited in this category is Ribble’s nine elements of digital citizenship (Ribble, 2015; see also Ribble et al., 2004). While aimed at schools, it is also said to serve the needs of TEDs. This framework conceptualizes digital citizenship as “the norms of appropriate, responsible behavior with regard to technology use” (Ribble, 2015, p. 15), which includes, for example, digital rights and responsibilities, digital literacy, and digital health and wellness. Although criticized for limited conceptual scope and strong normativity (Heath, 2018; Jørring et al., 2018), Ribble’s conceptualization has become highly influential in educational research, establishing a strand for subsequent theoretical works of considerable influence (e.g., James et al., 2021; Jones & Mitchell, 2016).

A growing, more critical category of approaches in education challenges this “responsible use” category. Highly influential in this category is Choi (2016), who conceptualizes digital citizenship as (a) ethics, (b) media and information literacy for access to and use of digital technologies, (c) participation in society, and (d) activism and critique of power structures for social justice. Extending this critical orientation, Emejulu and McGregor (2019) propose “radical digital citizenship” that moves beyond

individualized skill acquisition to critically examine technology’s material foundations and to collectively build emancipatory alternatives, positioning citizenship as a fundamentally political process of becoming (cf. Ross et al., 2022). For Emejulu and McGregor, criticality centers not on digital technologies but their relations. As McCosker et al.’s (2016) observe, “digital sociality maintains rather than overcomes, in most instances, pre-existing arrangements of power” (p. 8), challenging assumptions that digital technologies inherently democratize participation.

Conceptualizations of digital citizenship referred to in educational research have also originated outside the American context. For example, the EU has played an active role through the European Commission’s development of the DigComp iterations. Following the EU’s 2006 addition of digital competence as a key competence for lifelong learning (European Parliament, 2006), work began to define what digital competence entails for citizens (Ala-Mutka, 2011). This informed the initial DigComp report, which defined digital competence for citizens as “the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society” (Ferrari, 2013, p. 2). Several iterations later, November 2025 marked the public release of the latest framework, DigComp 3.0, with increased focus on AI dimensions (Cosgrove & Cachia, 2025). The DigComp framework has also been adapted for educators (Redecker, 2017), though teacher competence frameworks more broadly pay limited attention to citizenship dimensions: a systematic review identified digital citizenship in only three of 24 analyzed frameworks (Villar-Onrubia et al., 2022). Another transnational organization showing interest in digital citizenship is the Council of Europe—naming 2025 Year of Digital Citizenship Education (Council of Europe, n.d.)—which in one of their early key publications defined digital citizenship as:

- engaging competently and positively with digital technologies, and
- active and responsible participation locally, nationally, and globally across multiple levels, e.g., socially, politically, and culturally, and
- involvement in lifelong learning (Frau-Meigs et al., 2017, p. 15).

While the conceptualizations originating in the work of the EU are not necessarily used to operationalize digital citizenship in educational research, they are often used to guide or position research, or to provide a basis for elaborations on conceptualizations of digital citizenship. These diverse conceptual approaches inform policy expectations for TE. Yet as this chapter has shown, how such expectations translate into practice

depends significantly on the institutional landscape within which TEDs work.

### ***Digital citizenship in Swedish education: Policy expansion and the Nordic approach (2017–2022)***

Against this international backdrop of diverse conceptual approaches to digital citizenship, Sweden has developed policy responses shaped by Nordic educational traditions and, more recently, by shifting political landscapes.

The 2010s marked a particularly intensive period of policy development specifically addressing young people’s digital competence in relation to democratic participation. The growing emphasis on digital competence in Swedish education had implications for TE broadly and social science TE particularly. Key developments included the 2017–2022 national school digitalization strategy (Supplement to Government Decision U2017/04119/S), its accompanying action plan (Swedish Association of Local Authorities and Regions, 2019), and national curricula revisions (Swedish National Agency for Education, 2018a, 2018b), supported by the Swedish National Agency for Education’s clarified responsibility to promote digital transformation (Sw. *sektoransvar*; SFS 2015:1047). These developments represented a shift toward actionable digital competence conceptualized in relation to both students’ capabilities and economic imperatives (Rensfeldt & Player-Koro, 2020).

While digital competence has attracted attention globally (see e.g., Ilomäki et al., 2016; Pettersson, 2018; Spante et al., 2018), there is a distinct Nordic approach which includes digital citizenship. TEDs’ PDC must therefore account for this Nordic approach, as national curricula are important steering documents that TE and TEDs need to consider. In the Nordics (Lisborg et al., 2021), these include, for example, communication and handling information, critical approaches to digital technologies in relation to issues in wider society, and Bildung characteristics, highlighting “both the opportunities and risks present in a digitalized society, in order to become a responsible citizen” (Godhe, 2019, p. 33). This Nordic emphasis on critical approaches and recognizing both opportunities and risks aligns with postdigital research that resist dichotomous framings of digital technologies as inherently beneficial or harmful (Jandrić & Knox, 2022; Jandrić et al., 2018).

For TE programs, these changes have meant that TEDs must ensure that student teachers graduate with digital competence in line with policy

(Hanell, 2018; Lindfors et al., 2021). The focus on young people's development of digital competence in schools puts pressure on TEDs because they must prepare student teachers who, in their future careers, will support young people's digital competence development (Papers II–IV). This dual-didactic task requires TEDs to have PDC themselves that include both content knowledge and capabilities to model pedagogical approaches for teaching such content (Uerz et al., 2018). For example, given AI systems' societal embeddedness, PDC requires transdisciplinary perspectives, critical evaluation of AI's alignment with democratic principles, and pedagogical approaches that move students from passive technology adoption to informed participation in shaping sociotechnical futures for the common good (Dignum, 2021; Floridi et al., 2018). Yet Swedish TEDs often lack continuous professional development in PDC and need further support both at institutional (Lindfors et al., 2021; cf. Paper IV) and national policy levels (Lindfors & Olofsson, 2023; cf. Papers II–III). Swedish schoolteachers similarly report low PDC for AI and identify professional development as a pressing need (Swedish Teachers' Union, 2024), signaling cascading challenges for digital citizenship education across the education system.

### ***Contemporary tensions and policy pushback (2022–present)***

The policy expansion described above has encountered significant policy pushback since 2022. The Swedish government that took office that year has embraced neuro-educational arguments challenging the scientific foundations for engaging with digital technologies in schools (Forsler & Guyard, 2023; e.g., Government Offices, 2022, 2023). This shift reflects international patterns where neuroscience discourse is leveraged to reshape education (Kotouza et al., 2025). Recent government rhetoric frames this as a binary choice between digital devices *or* paper: “from screen to binder” (Sw. *från skärm till pärm*). Some scholars argue this framing serves as a smoke screen to demonstrate political force by reversing the previous government's school digitalization strategy (Bylund & Player-Koro, 2024; cf. Lindblad & Lundahl, 2026). Such shifts in digitalization policy reflect recurring patterns throughout Swedish education history, where sociotechnical imaginaries of future society and citizenship serve to motivate political reform (Rensfeldt & Player-Koro, 2020).

This policy pushback has direct implications for TE. Swedish TE sits at the intersection of responding to schools' needs through teacher preparation and steering schools through that same provision. Despite broader policies promoting higher education autonomy, TE steering has become

increasingly detailed (Lindblad & Lundahl, 2026), in this case, through imposing restrictions on digital technologies supported by cognitive science perspectives.

This policy shift reflects broader international anxieties about young people's relationships with technology. Examples include the influential but contested *The Anxious Generation* on the risks of social media (Haidt, 2024; Odgers, 2024), and countries implementing legislation and policies to limit social media use or screen time, such as Australia (Parliament of Australia, 2024), Denmark (Danish Ministry of Digital Affairs, 2025), and Sweden (Public Health Agency of Sweden, 2024).

Against this backdrop, a 2024 Swedish government inquiry proposes an increased focus on cognitive science in TE. The inquiry also proposes removing the explicit mention of schools' role for democracy from TE degree objectives, which is part of the Core Education Subjects mandatory for all student teachers regardless of subject specialization (Paper II). The inquiry argues that because this role is expressed in national curricula, it "naturally becomes part of teaching and learning" (SOU 2024:81, pp. 73, 398). A separate 2025 government inquiry addresses national curricula for compulsory school, the context of lower secondary school social science education. This inquiry proposes the removal of "digital competence" in the introductory cross-curricular chapters while individual subjects would address digitalization where relevant (SOU 2025:19, pp. 500–501).

Both inquiries have prompted referrals and government press releases (Government Offices, 2025a, 2025b). These developments have drawn criticism from educational researchers, including the government decision to leave the education system out of the 2025-initiated national AI strategy (Falk et al., 2025; Nilsson et al., 2025). This exclusion is striking given young people's widespread engagement with AI (Swedish Internet Foundation, 2025b) and public expectations that teachers develop PDC that includes AI dimensions (European Commission, 2025b). It also contradicts widely acknowledged needs for educational responses that address AI's ethical, social, and democratic implications in postdigital contexts where AI is deeply embedded across societal domains (Carroll et al., 2024; Dignum, 2021; Floridi et al., 2018). However, in December 2025 the government took the formal decision to implement the 2028 TE Reform (Government Offices, 2025c). Whether the critique will have an influence on the other policy processes mentioned here remains to be seen.

As established above, the receptivity to these neuro-educational arguments must be considered in the context of broader trends shaping Swedish TE. The policy pushback against digital technologies in education emerges at a moment when TE's knowledge base in educational science has already been weakened, and when neoliberal discourse emphasizing measurability, accountability, and "what works" in classrooms is predominant (Beach & Bagley, 2012). Together, these developments converge, creating conditions where narratives challenging digital technologies in education find particularly fertile ground, and this at a time when young people face intensifying challenges to digital citizenship. While critical perspectives on digital technologies in education and society are important, dichotomous for/against approaches are not the way forward. Instead, education should be a site to raise questions about power, democratic erosion, and envision other, more just futures (Forsler et al., 2025; cf. Livingstone, 2024). Swedish teachers report that rather than adopting dichotomous positions, they navigate digital technologies by weighing advantages and disadvantages. Like their colleagues globally, they express concern about inadequate competence. This concern relates to multiple levels—from technology investments to classroom activities—and therefore call for government-initiated AI guidelines for education (OECD, 2025; Swedish Teachers' Union, 2024). This framing recognizes that technology's societal impact is not isolated from economic, social, and political decisions about how technologies are shaped and governed (Acemoglu & Johnson, 2024). The growing discourse on AI in education exemplifies ongoing struggles over who has power to define public education's purposes (Rensfeldt & Rahm, 2023).

These policy shifts toward de-emphasizing democracy in TE and restricting digital technologies also occur at a moment when international assessments and research signal opposite needs. In the 2022 International Civic and Citizenship Education Study (ICCS) and the 2023 International Computer and Information Literacy Study (ICILS), Swedish secondary students demonstrated achievement gaps across democratic and digital competences (Frailon, 2024; Schulz et al., 2024). In other words, the policy pushback against digital technologies in education contradicts empirical reports demonstrating both the importance of digital-democratic capabilities and persistent inequalities in these areas. As Pangrazio and Selwyn (2021) observe, "These are not topics and issues that young people can learn on their own" (p. 446). The myth of the digital native obscures this variation in capabilities and resources. While today's young people never experienced the world pre-digital, they can envision and build other sociotechnical futures for which education plays a key role (Livingstone, 2024). Notably, while ICCS 2022 included engagement

through digital technologies and digital citizenship in its framework (Schulz et al., 2023, p. 125), Swedish national reports on ICCS largely omitted this focus (Arensmeier, 2024; Swedish National Agency for Education, 2023). This omission stands in sharp contrast to the focus in this thesis on how digital technologies and citizenship are entangled (Papers I–IV).<sup>9</sup>

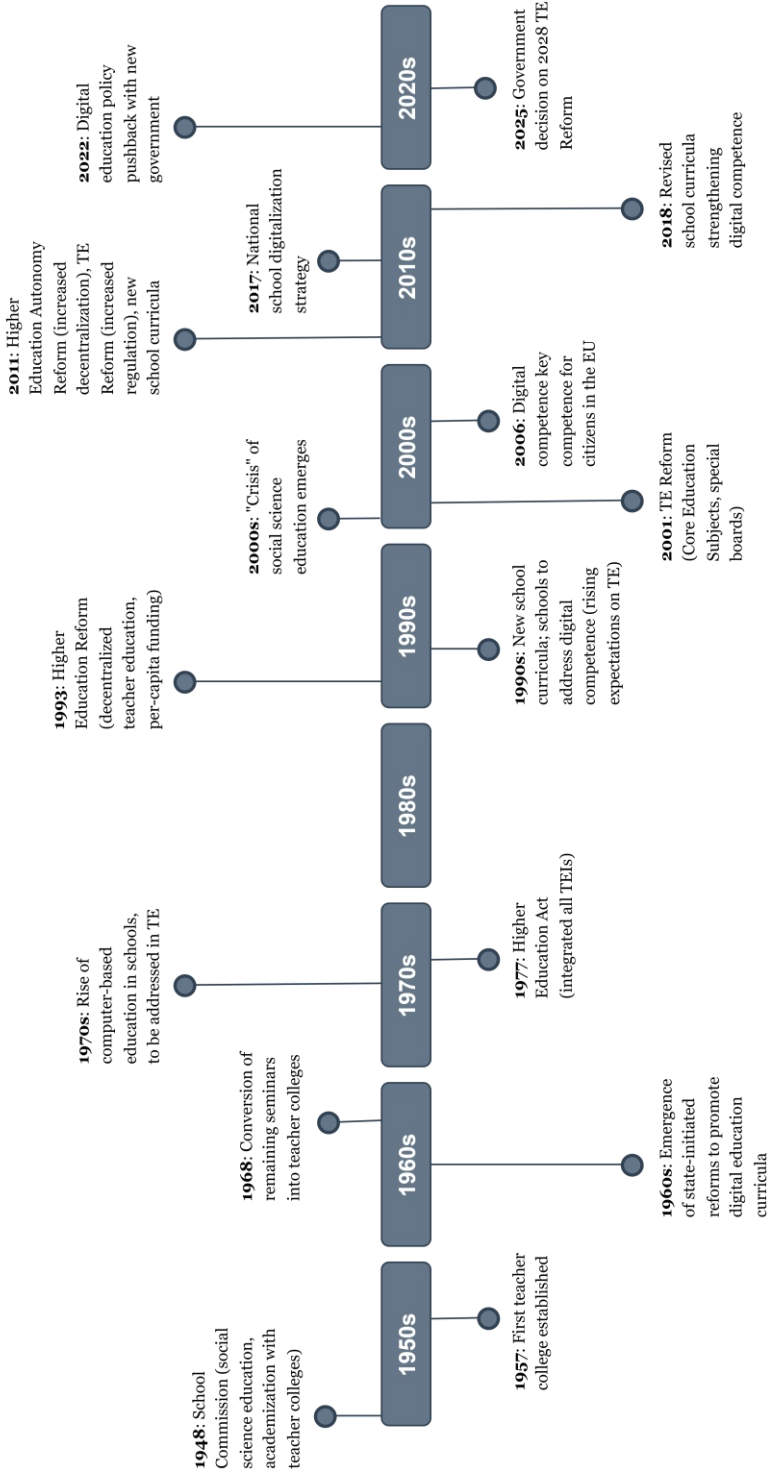
### ***Chapter summary***

In this chapter, I have traced Swedish social science TE from its postwar establishment, through academization and governance reforms, to contemporary challenges where democratic participation has become entangled with digital technologies. Sweden’s decentralized governance model grants TEIs and TEDs considerable autonomy in organizing program content and enacting digital citizenship education. I have mapped international conceptualizations of digital citizenship, from responsible use approaches to critical frameworks, and Swedish policy developments from the 2010s expansion to recent pushback. Both research and the policy landscape remain contested, with no settled consensus on how digital citizenship should be understood or addressed in education.

These developments, summarized in Figure 1 (p. 41), create a critical juncture for TEDs in social science TE. As this chapter has established, the institutional landscape, characterized by decentralized governance, coordination challenges, and resource constraints, constitutes the conditions within which TEDs work. As part of this work, they must teach student teachers how to teach for digital citizenship, which is a dual-didactic task that requires PDC to address both content knowledge and pedagogical approaches in postdigital contexts. Meanwhile, they must navigate competing educational perspectives, including the recent discursive emphasis on cognitive science, alongside policy uncertainty and shifting digital education priorities. Understanding how TEDs navigate these challenges within their institutional arrangements demands attention to existing research on the TED profession, their PDC, and digital citizenship education, which is the focus of the following chapter.

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<sup>9</sup> Sweden has participated in all ICCS cycles (2009, 2016, 2022) but only in the 2023 ICILS cycle. The achievement gaps observed in these studies are not isolated. The 2023 TIMSS study of mathematics and natural sciences shows similar patterns, with students from socioeconomically disadvantaged backgrounds demonstrating stagnant performance while other groups improved (von Davier et al., 2024). This suggests systemic challenges across subjects and educational levels.



**Figure 1.** Brief overview of key pivotal points in social science TE relevant to the thesis.

# Previous research

In this chapter, I focus on research on the core aspects of the TED profession, particularly teaching student teachers how to teach. I then examine research on digital citizenship in TE contexts and TEDs' PDC for this dual-didactic work. Together, these areas establish the foundation for this thesis's contribution to understanding how TEDs in social science TE approach teaching to teach for digital citizenship in postdigital contexts.

## The teacher educator profession

University-based TEDs constitute a diverse group defined by teaching student teachers how to teach, whereby they by default become TEDs (Dinkelman, 2011). Comparisons show that TEDs generally lack an established, formalized knowledge base, although examples of such initiatives exist in countries like Belgium, Israel, and the US (Cochran-Smith et al., 2020; Murray et al., 2017). There is therefore little formal preparation for TEDs. According to Goodwin et al. (2014), this is particularly evident in relation to the pedagogical expertise required for TEDs' dual-didactic task.

The lack of a formalized knowledge base means there is a plethora of pathways into the TED profession across national contexts (Cochran-Smith et al., 2020). In Sweden, these pathways show in the diversity across schoolteacher experience and academic research careers (Angervall et al., 2020; Strandler, 2023), but also disciplinary backgrounds in social science TE (Papers III–IV). Common induction challenges globally include lack of TE-specific training, negative self-views when learning to navigate the institutional arrangements of TE, and unclear expectations leading to uncertainty of one's capabilities to deliver as a TED (Izadinia, 2014). This latter challenge is particularly visible in European contexts despite the need for such clarity (European Commission, 2013; cf. Dengerink et al., 2015).

These characteristics contribute to the TED profession's sometimes semi-professional status (Goodwin et al., 2014; Murray & Male, 2005), shaping how TEDs navigate TE contexts. For example, scholars across diverse contexts argue that TEDs often self-identify with their disciplinary training (Dinkelman, 2011; Goodwin et al., 2014; Izadinia, 2014), although not always. In Tryggvason's (2012) focus-group interviews, Finnish TEDs described themselves as representatives of educational

science rather than their disciplines. Also influencing self-identity is TEDs' primary duties such as research or teaching (Angervall et al., 2020), this despite their necessary reciprocity in TE (Cochran-Smith, 2005; Dengerink et al., 2015). As Dinkelman (2011) reflects on his own experience teaching social science TE in the US, TEDs' identities are:

*multiple, fluid, always developing, shaped by a broad range of sociocultural power relationships, strongly influenced by any number of relevant contexts and relational. Teacher educator identities reflect an unstable and ever-shifting weave of personal and professional phenomena. They are both claimed by teacher educators and given to them via the roles and institutions that frame the profession (p. 309)*

This fluidity manifests in how TEDs engage with the profession, sometimes through deliberate self-identification, other times through teaching assignments that by default make one a TED, or through accepting positions in TE because of where employment opportunities exist (cf. Goodwin et al., 2014; Loughran & Menter, 2019; Swedish Higher Education Authority, 2024). When identities are externally assigned rather than internally claimed, TEDs who do not self-identify as such have limited chance to develop a TED identity, as demonstrated both in Izadinia's (2014) review and Murray and Male's (2005) interview study with British TEDs. Self-identifying as a TED is essential for engaging with their professional role and dual-didactic task.

TEDs' identities are also influenced by factors both outside and inside the TEIs where they work. Outside TEIs, power dynamics and political developments can have a bearing on TEDs' work, such as wider discourse on whether new teachers are adequately prepared with subsequent calls for institutional accountability (Dinkelman, 2011). Politicians globally have increasingly aimed at TE reform to improve the TED profession, particularly against the backdrop of PISA rankings, although with little consideration of TEDs' expertise and experience (Menter, 2023; cf. Korthagen et al., 2005; Loughran & Menter, 2019). Such initiatives reflect how TE is a key site of struggle over what societies value in terms of what citizen the school system should promote (Menter, 2023).

Inside TEIs, dynamics shape TEDs' identities, for example, their practices as TEDs and as (TE) researchers, balancing teaching duties and engagement with research for promotion (Dinkelman, 2011; Goodwin et al., 2014; Korthagen et al., 2005). Other important institutional arrangements, such as TEI organization, TE program conceptualization and program structure, shape TEDs and their teaching practices

(Loughran, 2007). As Angervall et al. (2020) and Strandler (2023) show in their ethnographic studies of Swedish TEDs, TEI dynamics can lead to tensions between TEDs' professional autonomy and institutional constraints, experienced differently by different types of TEDs depending on their arrangements. TEDs in Sweden and beyond navigate these tensions (Edling & Mooney Simmie, 2020; la Velle, 2023), yet developing a TED identity still involves to a significant degree professional choices, which "contribute to what it means to be a teacher educator 'kind of person . . . in a given kind of context'" (Dinkelman, 2011, p. 314). These choices can be aided if TEDs belong to the same unit within the TEI (e.g., faculty or department), facilitating both mutual exchange and socialization into the TED profession (Tryggvason, 2012).

### ***Teaching to teach***

Acknowledging the symbiotic importance of TEDs' research and teaching (Cochran-Smith, 2005), the focus in this thesis is on the teaching dimension, particularly TEDs' approaches to the dual-didactic task. Such teaching is complex. As Loughran (2007) observes, it requires deep conceptual knowledge, skills, attitudes, and TE-specific pedagogical capabilities. In other words, it requires teaching subject content while also explicating their actions as teachers. TEDs role-model teaching in ways that allow student teachers to "see into" teaching practices (Loughran, 2007, p. 5) and be able to draw on this in their future schoolteacher practice (Korthagen et al., 2005; Lunenberg et al., 2007). Consequently, TEDs need to support student teachers to perceive aspects in authentic teaching and learning situations in ways that develop their theoretical knowledge, practical wisdom, and pedagogical experience in tandem (Lunenberg & Korthagen, 2009). The TED profession thus involves pedagogical practice that goes beyond content delivery, which is challenging for many TEDs given that they must teach in ways they themselves have not experienced as learners (Darling-Hammond, 2005). This challenge is compounded by the lack of formal preparation. Without it, TEDs risk defaulting to previous experience, such as first-order teaching of disciplinary content (Goodwin et al., 2014), rather than helping student teachers translate content into purposeful classroom pedagogies (Thompson, 2023).

Studies show that such dual-didactic practice requires deliberate honing. Goodwin et al.'s (2014) mixed method study integrating survey and interview data of new and experienced TEDs (mainly from the US) showed that competent teachers do not automatically make competent TEDs. TEDs do not simply learn the profession on the job. Similarly, Lunenberg

et al.'s (2007) review of the literature and observations of Dutch TEDs led them to conclude that TED experience alone has limited effects on dual-didactic practice. Instead, a confluence of professional characteristics is at play, such as TEDs' backgrounds, experience, and profession-related understandings (Korthagen et al., 2005).

In the geographical context of the thesis, particularly noteworthy is Strandler's (2023) ethnographic fieldwork and follow-up interviews with Swedish TEDs. Strandler shows how TEDs' characteristics are bound up with institutional arrangements, such as university hierarchies and induction into the TED profession. These entanglements shape TEDs' practices, roles, and responsibilities, such as a narrow focus on one's own program contribution paired with reliance on program coordinators to "have the full picture" (p. 8; cf. Papers II–III). Complementing these results, Angervall et al.'s (2020) interviews with Swedish TEDs highlight additional institutional arrangements such as power relations and work culture. These include teaching load and career choices where research is pitted against teaching, with implications for the research base of TE program delivery (cf. Papers II–III). A macro layer influencing these relations between TED characteristics and institutional arrangements is the broader neoliberal shift in society, shaping TEDs' practices, roles, responsibilities, and ultimately program delivery (cf. Beach & Bagley, 2012; Cochran-Smith et al., 2015).

In sum, research highlights that the TED profession is characterized by multidimensional identities. These are shaped by diverse pathways into the profession, limited formal preparation, and an interplay between TEDs' professional characteristics and institutional arrangements (cf. Papers II–IV). Central to TEDs' teaching is the dual-didactic task, which requires deep content knowledge and TE-specific pedagogical capabilities. Yet institutional arrangements, from TEI organization to political pressures, prove complex rather than unidirectional in shaping TEDs' work. Despite these challenges, the literature has generally paid limited attention to TEDs' qualities to navigate these complexities (Goodwin et al., 2014). Relevant research comes primarily from ethnographic and interview studies (e.g., Angervall et al., 2020; Strandler, 2023; Tryggvason, 2012). More broadly, the review by Cochran-Smith et al. (2015) shows that a considerable number of studies come from TEDs themselves, often small-scale, single-site, and with an emphasis on qualitative approaches. Cochran-Smith et al. argue for multi-site studies (cf. Papers II–IV) and more quantitative approaches, an observation echoed in the review by Dengerink et al. (2015) to contextualize small-scale studies (cf. Paper IV).

## Digital citizenship in teacher education

In this section, I examine digital citizenship in TE where research is markedly limited (von Gillern et al., 2024), particularly on TEDs. For example, in Pérez-Rodríguez's (2024) English–Spanish review of 62 studies on citizenship education in TE, only four focused on digital citizenship (all on student teachers), with only two studies overall focused on TEDs. This reflects a broader need for TE research on how digital competence's societal dimensions are addressed in Sweden and globally (Flores, 2023; Lindfors et al., 2021), specifically on TEDs.

Therefore, while the Background chapter followed Richardson et al.'s (2021) restrictive approach to describe the digital citizenship field conceptually, this section takes a broader approach given the scant TE-specific research. I include studies addressing democratic dimensions of digital technologies and digital competence for citizenship, even when not explicitly framed as digital citizenship research (e.g., Velandar et al., 2024, whose survey shows Swedish TEDs acknowledge AI's democratic implications).

Within the emerging TE literature on digital citizenship, substantial work has focused on the responsible use of digital technologies among student teachers. Gudmundsdottir and Hatlevik's (2020) interviews with Norwegian student teachers show that foci tend to revolve around technical rather than pedagogical aspects of responsibility during practicum. For example, these student teachers prioritized convenience over critical evaluation of information sources, despite having theoretical understanding of information retrieval. Addressing this theory–practice gap, von Gillern et al.'s (2024) qualitative analysis of 111 US student teachers' essay answers highlights the importance of addressing digital citizenship in tandem with related concepts such as media literacy to support a rich conceptual understanding (cf. Vajen et al., 2023). Beyond qualitative insights, quantitative approaches such as Gudmundsdottir et al.'s (2020) ICILS-informed survey with Spanish and Norwegian student teachers demonstrate correlations between perceived competence in privacy issues relating both to ability to evaluate digital content and addressing cyberbullying. These results underscore the importance of integrating responsible use in TE (cf. Cervera & Caena, 2022). Given these patterns, TEDs must support student teachers' critical engagement with digital technologies including their social effects, such as algorithmically curated content (Krutka et al., 2022). For example, Kruskopf et al.'s (2024) two surveys with Finnish student teachers ( $N= 347, 428$ ) demonstrate how background influences self-efficacy for teaching digital

competence, with algorithms emerging as a particularly challenging dimension. This warrants TED efforts to address subject-didactic aspects of digital citizenship (cf. Røkenes & Krumsvik, 2016), facilitated by cross-disciplinary TE coordination (Johannesen & Øgrim, 2020).

Studies with an explicit focus on TEDs and digital citizenship are scant. A notable exception is Lindsey's (2015) mixed methods study on American professional development initiatives on responsible use. Drawing on interviews with five TEDs, 73 completed pre-/post-test surveys with student teachers, and observations, Lindsey demonstrates how targeted professional development strengthened TEDs' dual-didactic teaching for digital citizenship, making student teachers more determined to teach for digital citizenship in their future practice. This study provides rare empirical insight into how TED preparation influences student teacher understandings and attitudes in digital citizenship education. However, TE research more broadly also needs insights into how TED preparation transfers to student teachers' situated practice, not just changes in their dispositions (Cochran-Smith et al., 2015).

Following ChatGPT's public release, scholars have increasingly drawn attention to how TEDs must support student teachers to critically engage with AI. This includes teaching student teachers how to teach in AI-infused contexts, for example with generative AI technologies (Carrillo & Flores, 2025; Mishra et al., 2025; Tondeur et al., 2025). Velandar et al.'s (2024) survey and focus group interviews with Swedish TEDs show a perceived lack of AI-related competence both in the students they prepare and their own PDC to address AI. Broadly, these TEDs express uncertainty about what digital competence entails in schools and their PDC to help student teachers develop relevant competence (cf. Fransson et al., 2018). Velandar et al. (2024) also observe how TEDs locate the responsibility for addressing this content within the school subjects social science education and Swedish (cf. Papers II–III). Yet literature reviews show that research on AI in TE is largely absent, particularly on the PDC that TEDs need (Sperling et al., 2024). This absence runs counter to scholar emphasis on the importance that dual-didactic approaches transfer to student teachers' future practice related to AI (Krumsvik, 2024; Rapanta et al., 2025).

TE research related to digital citizenship has also focused on policy documents developed within TEIs. In a document analysis of 317 curricula documents from six Norwegian TEIs, Nagel (2023) shows how social science TE's breadth of content stands out. It covers aspects such as culture, society, democracy, and digital responsibility, all demanding advanced levels of PDC. Given examples like "fostering pupils' ability to

live, work and be a democratic, digital citizen” (p. 115), Nagel argues that TEDs’ PDC must include a meta-perspective on digital technologies’ epistemic and societal implications, going beyond technical skills (cf. Paper I).

The conceptual ambiguity and divergence evident across these studies point to an underlying epistemic challenge, namely, what constitutes legitimate knowledge about digital citizenship, and how should such knowledge be constructed and validated in social science TE and social science education? Research has paid limited attention to how TEDs navigate these epistemic questions. This includes how TEDs approach what digital citizenship content matters, how they construct understanding of it, and how they decide what student teachers need to know to teach this content (cf. Papers II–IV). These epistemic dimensions are important given that TEDs’ epistemic practices, that is, the ways they engage with, interpret, and teach certain knowledge, shape what student teachers ultimately bring to schools.

In sum, research on digital citizenship in TE remains predominantly focused on student teachers rather than TEDs, with scant attention to the PDC TEDs need for this dual-didactic task, including questions of who bears responsibility and what it should entail. Where research addresses digital citizenship in TE, it tends toward responsible use approaches—a predominant approach to digital citizenship across literatures albeit conceptually limited (Heath, 2018; Jørring et al., 2018; McCosker et al., 2016)—with emerging but still limited attention to critical dimensions such as AI and algorithmic systems. TEDs express general uncertainties that reflect deeper epistemic challenges about what counts as legitimate knowledge in this contested area. While scholars call for coordinated efforts in digital citizenship education across all levels including TE (Mirra et al., 2022), empirical research on how TEDs navigate such coordination within institutional arrangements is nascent. These patterns underscore the need for research into how TEDs approach teaching to teach for digital citizenship within institutional arrangements (cf. Papers II–IV).

## Teacher educators’ professional digital competence

Having established how digital citizenship is addressed in TE, this section examines what PDC TEDs need for their dual-didactic task. While research on digital technologies in education has a long history, substantial research over the last decade has focused specifically on

various school professionals' digital competence and engagement with digital technologies, both in Sweden (e.g., Gustafsson, 2024; Holmgren, 2025; Löfving, 2025) and globally (Seufert et al., 2021). The research on TE and TEDs is comparatively smaller (Carpenter et al., 2024), with attention paid primarily to student teachers (e.g., Andreasen et al., 2022; Farjon et al., 2019; Kruskopf et al., 2024)—a pattern mirroring citizenship education research (see Introduction chapter, p. 9). More specifically, research focusing on TEDs' PDC is limited (Starkey, 2020; Uerz et al., 2018), which has prompted calls for more research given how PDC evolves with sociotechnical changes (Arstorp et al., 2024), particularly in the Nordics (Røkenes et al., 2022). The scarcity of research on TEDs' PDC mirrors the limited degree to which TE has addressed digital competence both in Scandinavia and internationally (Hjukse et al., 2020).

Despite widespread techno-optimism and technological determinism in educational research and practice (Jandrić & Knox, 2022; Krutka et al., 2025), many scholars argue that TEDs' PDC in the 2020s need to move beyond such instrumental understandings of digital technologies. These technologies are not mere “tools” in education and society (Bayne, 2015; Erstad & Voogt, 2018; Lund & Aagaard, 2020), an approach to PDC which Skantz-Åberg et al.'s (2022) literature review identifies as critical. A deep understanding of digital technologies supports TEDs in teaching student teachers how to teach, ensuring they are adequately prepared for work in postdigital contexts (cf. Krumsvik, 2014; Starkey, 2020). PDC thus needs to be evolving with qualities such as plasticity and temporality (Almåsen et al., 2021; Johannesen et al., 2014).

To support this dynamic character of PDC, studies covering diverse contexts and data stress the importance of institutional support for TEDs' PDC, such as Carpenter et al.'s (2024) international TED survey, Nelson et al.'s (2019) survey with US TEDs, and Tondeur et al.'s (2025) systematic review of qualitative evidence on TEDs' PDC. Studies emphasize the needs for integrated opportunities across the whole TE program for TEDs to act as role models, linking practice, theory, and dual-didactic reflections for student teachers (Foulger et al., 2017; Røkenes & Krumsvik, 2016; Tondeur et al., 2025). This includes attention to AI given its increasing importance in TE and society (Carrillo & Flores, 2025; Mishra et al., 2025). Interviews with Swedish TEDs suggest that complementary TE policy support for PDC could be necessary (Lindfors et al., 2021; see also Willermark et al., 2023). Norwegian case reports acknowledge this need while stressing the importance of local, material TEI structures in how PDC is addressed in TE (Andreasen et al., 2022; Johannesen & Øgrim, 2020). Yet the relationship between policy support and TEDs' PDC

appears complex. Carpenter et al.'s (2024) results suggest that even when visions of PDC are integrated across the TE program, these function neither as an asset nor as a barrier to TEDs' PDC. These results reflect other studies which indicate that institutional support for PDC is not unidirectional but complex (Bussesund et al., 2025; Voithofer et al., 2019; cf. Papers II–IV). For example, as TEDs are part of a collective, they can disengage with digital technologies in teaching and learning. Interviews with Swedish TEDs suggest such disengagement can work both to reduce the sense of being responsible for one's own PDC, while maintaining identity and agency (Viberg et al., 2023).

To keep up with these evolving postdigital contexts, studies highlight the importance of TEDs' continuous professional development in PDC. American survey data suggest that technical knowledge alone is not a significant predictor for TEDs' PDC (Voithofer et al., 2019), indicating that professional development needs to be tailor-made for different TEDs (Pedersen et al., 2024). Through role-modeling, TEDs can show colleagues the value added in engaging with digital technologies (Amhag et al., 2019; Gudmundsdottir & Hatlevik, 2018; Lindfors et al., 2021). Beyond peer learning, international reports show TEDs appreciate formal professional development sessions provided these are relevant to their PDC needs at hand, although self-directed learning is also common (Carpenter et al., 2024; cf. Paper IV). However, Pedersen et al.'s (2024) survey with Norwegian TEDs shows that those already self-reporting high PDC are more likely to engage in diverse strategies to develop PDC, such as self-study and peer collaborations, and vice versa.

Institutional support and professional development take on specific importance given the studies that highlight how TEDs' personal characteristics shape TEDs' PDC. Such characteristics include discipline, beliefs, and experience related to digital technologies (Aagaard et al., 2024; Pedersen et al., 2024; cf. Papers III–IV). Similar patterns emerge in research on schoolteachers' competence in digital citizenship education. Years of teaching experience, use of social networking services, and perceived internet self-efficacy significantly influence schoolteachers' competence levels (Choi et al., 2018), suggesting that such personal characteristics may similarly shape TEDs' approaches. For TEDs specifically, both TED and schoolteacher experience seem to play a limited role according to a survey with US TEDs, while discipline emerges as more important for PDC (Nelson et al., 2019). Discipline's importance has been highlighted also in surveys with Belgian TEDs by Tondeur et al. (2019) and with Norwegian TEDs by Hjukse et al. (2020). The latter also showed that, like Nelson et al. (2019), TED experience and age play limited roles,

but also that TEDs in social science TE engage more with PDC than other TEDs. These results are important as the role of beliefs and attitudes related to digital technologies in TE can have ripple effects in different ways. For example, sense of self-efficacy in PDC can shape TEDs' pedagogical approaches (Herro et al., 2021; Instefjord & Munthe, 2017). Adnan et al. (2024) demonstrate in their mixed method study of Turkish TEDs that lower self-reported PDC relates to skepticism about digital technologies' relevance to the subject they teach (cf. Paper III). Qualitative research further shows how Norwegian TEDs' approaches to PDC vary with their roles, identities, and institutional arrangements even among TEDs implementing PDC policy (Bussesund et al., 2025; cf. Papers II–IV). To ensure TEDs' beliefs align with their dual-didactic task, Røkenes et al. (2022) stress the importance of responsibility distribution within TE.

In other words, the interplay of several factors shapes TEDs' pedagogical approaches. This insight is important because targeted efforts in TE have been shown to have significant effects on student teachers' conceptual and practical knowledge through their learning experiences, which likely transfer to how they engage with digital technologies in schools (Farjon et al., 2019; Wilson et al., 2020; cf. OECD, 2025). For TEDs' PDC, particular challenges appear subject-related or didactic (Aagaard et al., 2022; cf. Røkenes & Krumsvik, 2016), including addressing epistemic dimensions where the result in TEDs' practices may be instrumental even when supported by long-term investments (Aagaard et al., 2024).

Beyond these specific factors, researchers increasingly recognize the need for more ecological approaches to TEDs' PDC. Such approaches are not new in research on digital technologies in education (see e.g., calls for sociotechnical perspectives made by Angeli & Valanides, 2008) and they align with broader TE research trends. For example, Cochran-Smith et al.'s (2015) literature review questions approaches "that place the locus of teacher knowledge within individual teacher candidates" (p. 113). Yet the role of context for TEDs' PDC is under-researched, as Carpenter et al. (2024) observe in their international TED survey. The authors advocate against over-emphasizing person-centered TED PDC and instead consider institutional arrangements. Their emphasis aligns with postdigital scholarship, where scholars like Fawns (2022) and Markauskaite et al. (2023) argue that PDC can be understood as within TEDs but also contingent on the sociotechnical context in which pedagogical activities are situated (cf. Paper I).

Attempts to theorize such complexity are not new in educational research involving digital technologies. For example, Cultural-Historical Activity

Theory (CHAT) in its various iterations, with its attention to mediated activity and contradictions as drivers of learning and development (Engeström & Sannino, 2021), has contributed to analysis of professional learning in technology-mediated contexts. However, critics have highlighted CHAT's focus on relatively bounded activity systems that struggle to capture broader societal phenomena, such as power relations and structural inequalities (Blunden, 2015; Schirmer & Geithner, 2018), and for limited engagement with digital technologies in contexts where digital-material boundaries are fundamentally blurred (Psaros, 2022). For example, when TEDs address AI in digital citizenship education, AI is not merely a "tool" mediating teaching activity (as discussed above, p. 49), but simultaneously corporate infrastructure, policy object, and entanglement implicating democracy, Global North–South labor, and environmental (in)justice. These dimensions, highlighted in critical scholarship (Emejulu & McGregor, 2019), challenge CHAT's analytical scope. Similarly, Actor-Network Theory (ANT), which foregrounds material agency and challenges human-centered accounts of technological change (Fenwick & Edwards, 2010), has offered valuable sociomaterial perspectives on digital technologies in education. Yet critics have challenged ANT's flat ontology for its inability to ground normative judgments about justice and democracy (Elder-Vass, 2015; Whittle & Spicer, 2008), which are concerns central to citizenship education. These limitations have opened space for postdigital theory, which addresses entanglements between digital technologies, individual–institutional dynamics, and broader societal structures including power, democracy, and inequality (see A postdigital lens chapter, p. 54).

Drawing together these various dimensions, such as institutional support, professional development, personal characteristics, and PDC contexts, Uerz et al.'s (2018) synthesis of research on TEDs' PDC identifies four key areas: (a) technology, (b) pedagogical and educational use, (c) beliefs, and (d) professional learning. Their review highlights that engaging with and linking technology to pedagogy and subject content requires attention to beliefs about added value and professional reflection on practice—themes evident across the studies discussed above.

In sum, previous research highlights that TEDs' PDC emerges through an interplay of multiple factors. These include TEDs' professional characteristics, such as beliefs and disciplinary backgrounds, and institutional arrangements, such as professional development, TE policy, and access to role models. Yet institutional support proves complex rather than unidirectional. Researchers also increasingly recognize PDC as ecological rather than solely located within individual TEDs. Literature

reviews have synthesized insights discussed in this section (e.g., Tondeur et al., 2025; Uerz et al., 2018). Much empirical evidence comes from surveys examining patterns across TEDs (e.g., Aagaard et al., 2024; Carpenter et al., 2024; Hjukse et al., 2020), sometimes within mixed method designs (Adnan et al., 2024; cf. Paper IV), and interviews exploring TEDs' experiences and views (e.g., Lindfors et al., 2021; Viberg et al., 2023; cf. Papers II–III). As Voogt et al. (2018) argue, combining quantitative and qualitative approaches strengthens understanding of PDC's complexities. Despite these insights, more research is needed on TEDs' PDC, particularly for teaching student teachers how to teach regarding digital technologies.

### ***Chapter summary***

Research on the TED profession reveals multidimensional identities emerging from diverse entry pathways, limited formal preparation, and tensions between TEDs' professional characteristics and institutional arrangements. Their dual-didactic task demands capabilities that need deliberate honing. Digital citizenship research in TE remains concentrated on student teachers, with nascent empirical attention to TEDs' approaches within institutional arrangements. Research on TEDs' PDC is more substantial, demonstrating how PDC emerges through an interplay between TEDs' characteristics, including disciplinary backgrounds, beliefs, experiences, and institutional arrangements such as professional development opportunities, policy support, and organizational structures. An emerging strand increasingly recognizes that competence cannot be located solely within individuals but is contingent on sociotechnical contexts. Despite these insights, frameworks addressing such entanglements across individual–institutional dynamics with broader societal structures remain limited. Thus, in the next chapter, I elaborate on postdigital theory as the analytical lens for understanding TEDs' PDC to teach teaching for digital citizenship.

# Theoretical framework

In this chapter, I establish the theoretical framework for this thesis. Central to this framework is a postdigital lens grounded in *entanglements*: the inseparability of humans, digital technologies, and social practices in shaping citizenship, education, and democratic participation. Throughout the thesis, I understand TEDs' work within institutional arrangements as part of these entanglements. First, I develop the postdigital lens as an analytical approach and its implications for the research. Through this lens, I then examine digital citizenship and professional digital competence (PDC), reconceptualizing them as subject content and pedagogical practice, and as ecological capability, respectively.

The theoretical stance underpinning this framework—a postdigital lens grounded in entanglements—remained consistent across all four papers. As I developed this framework through the emergent research design (see Methodology and methods chapter, p. 67), I drew on additional theoretical resources to address specific analytical needs in individual papers. These include sociomaterialist concepts such as Barad's (2007) agential cuts for making analytical distinctions within entanglements (Paper I). These resources also include Lipsky's (2010) concept of street-level bureaucracy for describing how frontline professionals exercise discretion within institutional constraints (Paper III; Discussion chapter).

I organize the chapter in three main sections. In the first section, I describe the postdigital lens, outlining its theoretical dimensions and implications for understanding TEDs' work in postdigital contexts. In the second section, I examine digital citizenship through this postdigital lens, showing how it operates both as subject content and pedagogical practice in social science TE. In the third section, I discuss PDC, tracing how my understanding of it evolved from dimensional frameworks toward more ecological, responsive conceptualizations aligned with postdigital contexts.

## A postdigital lens

The RQs addressed in this thesis fundamentally concern relationships between humans and digital technologies in educational contexts which are situated in broader societal contexts. As “no observation is theory-free” (Cohen et al., 2018, p. 77), the theoretical lens through which these relationships are understood has implications for the research process,

the results, and their interpretation. Like putting on a different pair of glasses, a theoretical lens shapes what is constituted as meaningful in research and how relationships are understood, not simply what angle is taken on objects (cf. Fawns et al., 2023; Markauskaite et al., 2023). This thesis uses a postdigital lens as its analytical framework, which shapes the conceptualization and operationalization of both digital citizenship and PDC throughout Papers I–IV. Reflecting the overarching emergent design, the operationalization of the postdigital developed over the course of the thesis project as described below.

### ***A critical approach to sociotechnical relations***

A postdigital lens is not to be understood as a state of “after-the-digital” (Taffel, 2016) but as a critical approach to technology and society (Jandrić et al., 2018), where the prefix *post* signals that “we have something to talk about” (Sinclair & Hayes, 2019, p. 129). Drawing on critical traditions in research on education and digital technologies that destabilize taken-for-granted assumptions (Macgilchrist, 2021), this approach enables interrogation of whose interests are served by dominant narratives about digital technologies and to attend to how technologies contribute to reproducing or challenging inequalities. It challenges instrumental, technology-determinist or otherwise conventional understandings of human–technology relations prevalent in educational policy and practice (Jandrić & Knox, 2022; Mishra et al., 2025).

In contrast to human-centered, instrumentalist understandings of technology such as TEDs “using” technology to “enhance” learning (Bayne, 2015), a postdigital lens entails “a messier view of socio-technical relations” (Fawns et al., 2023, p. 633). This includes an understanding of digital technologies and social practices as mutually shaping (MacKenzie & Wajcman, 1999) across political, economic, and social contexts rather than separate from them (Cramer, 2014; Knox, 2019). From this stance follows that “We are increasingly no longer in a world where digital technology and media is separate, virtual, ‘other’ to a ‘natural’ human and social life” (Jandrić et al., 2018, p. 893): digital technologies are embedded in social contexts.

In postdigital contexts, entanglements include, for example, the datafication of citizens’ lives. Citizens become data points collected, analyzed, and acted on through opaque digital infrastructures including AI technologies, with implications for democracy, society, and social life (Hintz et al., 2019; Zuboff, 2019). These data are thus not neutral but multidimensional, shaped by design choices in the past, utilized and

repurposed in the present, and extended into the future through technologies like generative AI (Hildebrand, 2024; cf. Örtengren, 2024b). At the same time, citizens act through digital technologies, and in doing so, they bring these entanglements into being and shape sociotechnical relations (Isin & Ruppert, 2020). In the face of challenges such as AI-powered deep fakes, recommendation algorithms, and misinformation, there are therefore also opportunities for resistance and responsive democracies by promoting both citizens' digital competence and broader systemic changes (Cosgrove & Cachia, 2025; Hintz et al., 2019; Innerarity, 2024). Humans and technology are inherently connected, which makes digital technologies political (Jandrić & Knox, 2022): digital technologies like AI are sociotechnical systems with implications for society, citizenship, and education (Selwyn, 2022; cf. Carroll et al., 2024). These implications shape what TEDs in social science TE must prepare student teachers to navigate.

### ***Key dimensions of the postdigital lens***

Reflecting the emergent understanding developed across Papers I–IV, the postdigital lens developed here includes several co-constitutive dimensions. Together, these form a distinct research approach to understanding how TEDs in social science TE approach teaching to teach for digital citizenship.

First, *entanglements rather than separations* are central, stemming from a rejection of binary conceptions (e.g., digital–analog, online–offline, virtual–real). Instead, digital technologies are understood as embedded in society (Cramer, 2014; Knox, 2019). The digital is “noticed only by its absence, not its presence” (Negroponte, 1998).

Second, within this postdigital lens, agency is understood as *relational*, which rejects the idea that agency resides solely in humans or non-human entities. Instead, agency is co-constitutive, emerging out of entanglements between humans and digital technologies within sociotechnical environments which too are entangled with broader societal structures (Jandrić & Ford, 2022; Pötzsch & Hayles, 2014). While human and technological agencies remain distinct, they do not operate independently. Agency emerges relationally (cf. Rapanta et al., 2025). Ontologically, this means digital technologies are neither passive tools awaiting human use nor autonomous agents, but active participants in shaping practices, decisions, and possibilities. This understanding affirms rather than diminishes the human role (Rapanta et al., 2025). In social

science TE contexts, TEDs shape how entanglements unfold through their approaches to digital citizenship education.

Generative AI exemplifies this co-constitutive agency in digital citizenship education. When TEDs engage with AI tools to address deepfakes or algorithmic bias as subject content with student teachers, neither the TED's pedagogies nor the AI's capabilities alone determine what learning emerges. Agency arises through their entanglement, as AI outputs prompt new pedagogical questions while TEDs through their dual-didactic task shape how those outputs become meaningful for teaching for digital citizenship.

Third, the postdigital lens foregrounds *a critical approach* to rhetoric around technology. For example, it serves to critically engage with technological determinism that, as Jandrić and Knox observe (2022), dominates education practices, politics and policy. These are arenas where interests beyond education are represented: businesses, think tanks, government agencies, and foundations, to name a few (Player-Koro et al., 2018). These interests often advance discourse that positions technologies as inescapable forces of disruption, obscuring the contested nature of educational change (Rensfeldt & Rahm, 2023). In educational policy, this positioning often takes the form of framing technology as “the future,” an unquestionable trajectory used to justify institutional engagement with the latest technologies (Decuypere et al., 2025). This reflects how digital technologies such as generative AI are entangled with social, technological, and political-economic dimensions (Nichols et al., 2024; Selwyn, 2022; Williamson et al., 2023). Therefore, in contrast to the rhetoric of “digital transformation” and “increased efficiency,” the postdigital lens supports critical interrogation of dominant assumptions and the development of alternative understandings of technology (Jandrić & Knox, 2022), for example, troubling AI's implications from planetary to classroom perspectives (Bozkurt et al., 2024; Rapanta et al., 2025).

Fourth, the postdigital lens enables *responsiveness* to rapidly evolving contexts. Within this lens, postdigital contexts are understood as sociotechnical environments characterized by continuous renegotiation across dimensions such as human–technology, biological–informational, individual–collective, local–global, and their entanglement with democracy, social justice, and politics (Jandrić et al., 2018; Jandrić & Ford, 2022). A key theoretical principle underpinning this lens is never to lock into a once-and-for-all definition of the postdigital but always remain open precisely for the purpose of being able to engage with these fluid dimensions (Fawns et al., 2023; Jandrić & Ford, 2022).

Together, these four dimensions of the postdigital lens have several important implications for how this thesis approaches the study of TEDs' work and their PDC to teach teaching for digital citizenship in contexts where democratic participation is increasingly inseparable from digital technologies.

### ***Implications for the research in the thesis***

Using a postdigital lens has major implications for understanding sociotechnical relations (Knox, 2019), TEDs' PDC (Markauskaite et al., 2023) and, accordingly, teaching to teach for digital citizenship (Papers I–IV). The lens shifts the focus from centering on TEDs' capabilities to a more ecological view, where PDC in institutional settings is contingent on shifting entanglements between humans and non-human entities in pedagogical activities (as articulated in Paper I).

At the same time, using a lens necessarily involves making the research inquiry bounded, determining which entanglements to foreground and which to leave in the background (cf. Fawns et al., 2023). In Paper I specifically, I operationalized this through agential cuts (Barad, 2007), making analytical distinctions within entanglements while acknowledging their partiality. Throughout the thesis, I therefore use the postdigital lens in ways that both open up complexity (by foregrounding entanglements) and manage it (through focused analytical attention on TEDs' work, digital citizenship, and PDC). Critically, understanding digital technologies as political, embedded in power relations rather than neutral, shaped a key dimension of my analysis. That is, how TEDs' conceptualizations of digital citizenship engage sociotechnical dimensions (including the political) in postdigital contexts. This critical orientation manifests in examining the complexity of TEDs' work across TE sites while attending to broader sociopolitical implications for young people's democratic participation (cf. Macgilchrist, 2021). The critical work involves both acknowledging this complexity while challenging simplistic instrumental narratives. At stake is what counts as "good" citizenship education in postdigital contexts, determined by how TEDs' approaches shape student teachers' preparation to support digital citizenship in schools.

Such foregrounding of entanglements contributes to an ecological understanding that is responsive to the postdigital contexts in which social science TE is temporally and spatially situated. I have conceptualized such contexts elsewhere as postdigital democracies (Örtegren, 2024a): open-ended yet embedded within the messiness of

continuities and ruptures in what democracy, citizenship, and citizenship education mean in ever-evolving sociotechnical environments where the digital is an important dimension. Thus, to remain responsive to such contexts, educational approaches require degrees of plasticity and temporality both in research and practice (Paper III), thereby becoming attuned to “the social and technological realities of young people’s everyday lives” (Pangrazio & Selwyn, 2021, p. 436). For the research in this thesis, this in-flux quality has meant approaching the postdigital in different ways across papers: analytically (the sociomaterialist influence in Paper I), framings (“postdigital era” in Paper II), and practically (frameworks for understanding TEDs’ work requiring responsive PDC, Papers III–IV). To summarize, then, what is characteristic of the “matured” postdigital lens as used in this thesis, it emphasizes:

- A critical approach to dominant instrumental narratives and research approaches involving education, technology, and society
- Sociotechnical environments (not just relations) as entanglements in flux, with implications that transcend the immediate classroom setting to include broader societal structures, power, and democracy
- Responsiveness of PDC, whereby plasticity and temporality are key PDC qualities
- An ecological understanding of PDC to account both for the importance of TEDs’ professional competence, but also how they act within wider ecologies, here with attention to institutional arrangements.

The postdigital lens therefore serves both as a theoretical perspective to situate TEDs’ work and as an analytical tool for understanding their work. Specifically, it highlights how they approach their professional roles and responsibilities in ever-evolving contexts where digital technologies are no longer disruptive but embedded in education and democratic participation. Analytically, this lens enabled me to examine patterns that instrumental or tech-determinist frameworks would obscure: how variation in TEDs’ approaches reflects not just individual preferences but ontological commitments about human–technology relations, and how PDC emerges within institutional arrangements, entangled with broader societal structures, rather than residing in individual capabilities. This understanding forms the foundation for conceptualizing both digital citizenship and PDC in ways that engage with the entangled nature of postdigital contexts.

While the postdigital lens remains open and fluid, never locked into fixed definitions (Fawns et al., 2023; Jandrić & Ford, 2022), this openness does not preclude analytical rigor. As Jandrić et al. (2022) observe, the postdigital challenges definitive boundaries to remain responsive to evolving sociotechnical circumstances, creating inherent tension: the postdigital can employ any research methodology, yet not all research is postdigital. This tension requires explicit decisions about bounding the analysis.

Therefore, across Papers I–IV, I operationalized the postdigital lens through three complementary strategies. First, I maintained consistency across all papers in that the lens foregrounds the four dimensions described earlier. These dimensions adapt in how they inform analysis based on each study’s empirical material and research questions. Second, I delimited the empirical focus to TEDs in social science TE, their approaches to digital citizenship education, and their PDC within institutional arrangements. Third, this bounding shaped how I approached empirical data: foregrounding sociotechnical dimensions in data generation, attending to entanglements in analysis, and situating results against postdigital contexts rather than instrumental understandings. Acknowledging the need for conceptual clarity and research practices in postdigital research (Jandrić & Knox, 2022), I document my choices transparently in each paper’s methodology section, including what was foregrounded and what remained in the background. This approach distinguishes the thesis from postdigital scholarship that uses the term primarily as framing or node in research dialogue rather than as an analytical lens. Rather, in this thesis, the postdigital functions as a guiding idea (Jandrić et al., 2022) that shaped methodological decisions throughout the research process. This bounding enabled my use of the postdigital lens to be both theoretically responsive to evolving contexts and analytically productive, while acknowledging that this work represents one punctuation along ongoing scholarly engagement with the postdigital (Fawns et al., 2023, p. 631).

## Digital citizenship through a postdigital lens

As established in the Citizenship education in-the-making chapter, digital citizenship as a concept has evolved from traditional understandings of citizenship as a legal relation between citizens and nation-states (Marshall, 1950). Contemporary conceptualizations are more dynamic, acknowledging citizenship as both ever-evolving (Ong, 2006; Osler & Starkey, 2005) and something individuals have *and* do (van Gunsteren,

1998/2018; Yuval-Davis, 1997). This evolving character of citizenship is particularly important in postdigital contexts, where digital technologies are embedded in people's lives, changing how they act and interact as citizens (Hintz et al., 2019; Rapanta, 2023). How digital citizenship is conceptualized for education in these contexts therefore matters.

Yet digital citizenship conceptualizations vary considerably in their philosophical underpinnings. I analyze this variation in Paper I through systematic examination of three influential conceptualizations. Often, approaches to digital citizenship are grounded in instrumental or technological determinism (Heath, 2018). While technological determinism can help draw theoretical attention to technological change, it is limited in its assumption of change independent of society (MacKenzie & Wajcman, 1999). Through a postdigital lens, then, while these approaches offer important contributions, they tend to underemphasize the sociotechnical nature of democratic participation in postdigital contexts. This has implications for preparing social science student teachers. Understanding these philosophical underpinnings becomes essential for TEDs' PDC, as different conceptualizations shape what and how social science student teachers learn to teach for digital citizenship in schools.

Consequently, the postdigital lens entails an understanding of digital citizenship as emerging out of sociotechnical environments where humans, digital technologies and social practices are entangled, hence also digital and democratic capabilities, rather than as a separate set of skills or behaviors. Building on this postdigital understanding, traditional digital–analog or online–offline separations in citizenship become less meaningful. While traditional citizenship conceptualizations are unable to account for how citizenship plays out in postdigital contexts, it is important not to center on the digital but to consider the totality of citizenship, i.e., the relations of which the digital is a part (cf. Fawns et al., 2023; Hintz et al., 2019). As Choi (2016) emphasizes, digital citizenship must “be examined in conjunction with existing conceptions of citizenship because it is not a single dimension and/or a suddenly abrupt change in what citizenship means” (p. 589). Taking this understanding of continuity seriously in postdigital contexts renders a citizenship conceptualization that is neither grounded in people's place-based lives nor in the digital. Yet citizenship has become unimaginable without digital technologies (Hintz et al., 2019; cf. Zuboff, 2019; Paper I). Digital citizenship for postdigital contexts emerges from this understanding.

### ***Characteristics of digital citizenship***

First, a postdigital lens on digital citizenship acknowledges how citizenship is always-in-the-making. Digital citizenship is not a fixed endpoint to be achieved but ongoing (cf. Biesta & Lawy, 2006) within shifting entanglements, from algorithmic information environments to democratic participation (Cosgrove & Cachia, 2025).

Second, given this recognition of citizenship as always-in-the-making in these shifting postdigital contexts, a postdigital lens on digital citizenship highlights the importance of plasticity and temporality (see PDC section below) while critically engaging with digital technologies and democracy.

Third, a postdigital lens on digital citizenship acknowledges how it is inseparable from other dimensions of citizenship. It is not an add-on to “regular” citizenship. Rather, citizenship in postdigital contexts is relationally constituted. It emerges from relationships among citizens, digital technologies, and broader societal structures, not solely from individual competencies or technological affordances. For social science TE, this relational understanding means TEDs must prepare student teachers to address citizenship as emerging from these relationships rather than as isolated digital skills.

Regarding terminology, “postdigital citizenship” exists as an emerging concept (e.g., Rapanta, 2023; Villar-Onrubia et al., 2022), yet I use “digital citizenship” to position this thesis within the original, already established field that draws most research and policy attention, with the postdigital lens as part of the contribution. Regardless of terminology, a postdigital understanding of digital citizenship has important implications for social science TE.

### ***Implications for citizenship education in social science TE***

The postdigital lens on digital citizenship has implications for social science TE and social science education. Through this lens, rather than focusing primarily on responsible use of digital tools or “digital skills,” citizenship education must prepare young people in ways that meaningfully consider how digital technologies are embedded in society (cf. Knox, 2019) and the implications for democratic participation. This means that digital citizenship education is multidimensional—what I conceptualize in Paper I as a more holistic, entangled understanding of how democratic participation plays out in postdigital contexts. This includes, for example, understanding how digital technologies shape and are shaped by political participation, how algorithms and AI systems

shape information environments, and how citizens can critically engage with deepfakes and disinformation within these postdigital contexts, but also contribute to revitalizing democracy (cf. Frau-Meigs et al., 2017).

In this thesis, a postdigital lens on digital citizenship education requires TEDs' PDC to include conceptual understanding and practical skills to teach teaching for digital citizenship in ways that engage with these entanglements. My application of the lens across Papers II-IV shows that TEDs' own conceptualizations of digital citizenship may directly influence how they approach such teaching.

### ***Digital citizenship as social science subject content and pedagogical practice***

In the context of social science TE, digital citizenship operates at two interconnected levels. First, it operates as subject content, namely, knowledge related to understanding digital technologies' role in society and democratic participation. Second, it operates as pedagogical practice, that is, an acknowledgment that teaching for digital citizenship must be responsive to the postdigital contexts in which both social science TE and social science education are situated.

This dual character reflects one of the key challenges for TEDs highlighted in Papers III and IV, which is moving beyond content delivery to engage in dual-didactic practice that models responsive pedagogies for postdigital contexts. TEDs must understand digital citizenship as content and demonstrate, through their own teaching, how such teaching can be planned and enacted (cf. Korthagen et al., 2005; Loughran, 2007; Lunenberg et al., 2007), highlighting the importance of TEDs' PDC.

## **Professional digital competence**

The concept of PDC refers to the profession-specific knowledge, skills, and understanding that TEDs (but also schoolteachers) need to consider digital technologies in their work in educational contexts (Krumsvik, 2014; Lund et al., 2014). Originally developed in Norwegian TE contexts (Tømte et al., 2013), PDC has drawn global interest in ongoing research-informed discussions. What these conceptualizations have in common is their purpose to highlight professional capabilities that TEDs need to develop related to digital technologies. These capabilities have evolved over the years and range from general knowledge and skills, to teaching and learning and understanding digital technologies' implications for education and society (e.g., Brevik et al., 2019; Carpenter et al., 2020;

Falloon, 2020; Foulger et al., 2017; Gudmundsdottir & Hatlevik, 2018; Lund et al., 2014; Lund & Aagaard, 2020; McGarr & McDonough, 2019; Nagel, 2023).

Through the postdigital lens used in this thesis, however, PDC cannot be understood merely as a stable set of individual competencies that TEDs have (or not). Defining dimensions of PDC can be helpful as arbiters, drawing attention to qualities that are important for TEDs in their work to prepare social science student teachers. In this thesis, PDC emerges more as an in-flux capability (Almås et al., 2021; Johannesen et al., 2014; Lindfors et al., 2021), contingent on the shifting entanglements between TEDs, digital technologies, institutional structures, and the broader sociotechnical environments in which social science TE is situated (cf. Lamb et al., 2022; Markauskaite et al., 2023). This acknowledgment draws attention both to the evolving nature of TEDs' PDC and the importance of considering PDC in context (Carpenter et al., 2024).

### ***PDC as ecological and responsive***

Reflecting the emergent design of this thesis, the early engagements with TEDs' PDC here (Papers I–II) drew primarily on a four-dimensional understanding of PDC developed in the Norwegian TE context. According to this understanding, PDC comprises generic digital competence, subject-specific digital competence, profession-oriented digital competence, and transformative agency (Brevik et al., 2019; Gudmundsdottir & Hatlevik, 2018, 2020). This understanding of PDC provided useful analytical tools for the empirical work in Papers I and II, and a four-dimensional framework facilitates bounding research inquiry and exchange. However, I was uncertain as to how these dimensions accounted for the evolving, entangled nature of PDC in postdigital contexts.

Therefore, particularly in Papers III and IV, I shifted toward framing PDC as a more dynamic TED capability, always-in-the-making and requiring substantial degrees of plasticity and temporality to remain responsive to postdigital contexts (cf. Almås et al., 2021; Johannesen et al., 2014; Lindfors et al., 2021). This responsiveness is essential in digital citizenship education, where the subject content continuously evolves with sociotechnical changes.

This reframing of PDC in my research included adopting a more ecological understanding of PDC which acknowledges that TEDs' PDC is not merely the product of individual attributes but is contingent on entanglements

that involve institutional arrangements, disciplines, university policies, and broader societal contexts (Lamb et al., 2022; Markauskaite et al., 2023). As Dron (2022) observes, “it is the orchestrated assembly that teaches, not any one component of it” (p. 162). In postdigital contexts, this means TEDs’ PDC involves capabilities to orchestrate entanglements through practice, experimentation, and reflective engagement when preparing student teachers for digital citizenship education.

This ecological understanding shifted the focus of my research, from centering initially on what PDC TEDs need to have, to exploring and analyzing TEDs’ PDC as emerging within entangled, institutional arrangements where TEDs do their professional work. Particularly Papers III and IV reflect this shift by drawing attention not only to TEDs’ PDC, but to the role of professional characteristics (e.g., discipline, teaching experience) within institutional arrangements (e.g., program coordination, professional development) for PDC. Together, these are factors that influence TED’s work in ways that either support or constrain development and enactment of responsive PDC. In other words, developing PDC for digital citizenship education requires attention to both individual characteristics and the organizational conditions that support or limit such work.

### ***Dual-didactic practice***

Central to understanding PDC in social science TE is recognizing the dual-didactic nature of TEDs’ work. Unlike social science teachers who primarily teach subject content (first-order teaching), TEDs teach social science student teachers how to teach that content to young people in schools (second-order teaching), which requires PDC specific to the TED profession (Uerz et al., 2018; Lindfors et al., 2021; cf. Korthagen et al., 2005; Loughran, 2007). For digital citizenship education, this dual-didactic nature of PDC requires TEDs to understand digital citizenship conceptually and model responsive pedagogies that student teachers can draw on in their own future practice.

As demonstrated across Papers II-IV, many TEDs reportedly find the transposition from first to second-order teaching challenging, particularly when addressing rapid sociotechnical shifts such as AI’s role for democracy (cf. Krutka et al., 2025). The PDC needed for this work cannot be reduced to mastering technical skills or specific pedagogical skills. Instead, it requires dynamic professional capabilities that support TEDs to continuously adapt their teaching as digital technologies, subject content, and educational contexts evolve together.

## ***Chapter summary***

In postdigital contexts, PDC to teach teaching for digital citizenship must engage with the entanglements of democratic participation and digital technologies, and how these entanglements transcend the immediate social science classroom setting. This requires a shift from human-centered instrumental approaches that frame digital technologies as tools to be used toward more ecological understandings that recognize how digital technologies are embedded in social, political, and economic contexts which shape citizenship itself.

Such PDC requires capabilities for critical engagement with the philosophical underpinnings of digital citizenship conceptualizations, as explored in Paper I. It demands responsiveness to the in-flux character of social science subject content. Social science TE represents a multitude of disciplines, epistemologies, subject traditions, and professional experience among TEDs. This diversity necessitates institutional awareness of the dynamics between TEDs' individual capabilities and broader organizational and policy structures. These combined factors influence social science student teachers' preparation to teach for digital citizenship.

In this thesis, PDC is therefore understood not as primarily a professional attribute that TEDs have (although the first papers reflect such an approach), but as a relational capacity that emerges through their ongoing engagement with the challenges of preparing social science student teachers for digital citizenship education in postdigital contexts. This understanding forms the foundation for exploring and analyzing how TEDs approach their professional roles, responsibilities, and PDC to teach teaching for digital citizenship. The analysis includes factors potentially influencing these approaches within institutional arrangements of social science TE. Altogether, these dynamics are bound up with broader shifting entanglements.

# Methodology and methods

In this chapter, I describe the overarching research methodology, the methods used in the studies, and how these contribute to fulfilling the aim of the thesis. After introducing the emergent research design, I describe how I identified entry points into TEDs' work and digital citizenship education, then provide detailed accounts of each study's emergence, including its design and methodological approaches. I conclude with reflections on ethical considerations and methodological issues.

## Emergent research design

Although it is a growing field, few studies have focused on TEDs and teaching for digital citizenship in TE contexts, let alone social science TE. Scandinavian contexts, with their characteristic approaches to schools' role for democracy and digital competence, remain particularly underexplored in this regard. In this empirical context, I employed a qualitative-naturalistic inquiry for my thesis based on an *emergent research design* (Hammersley, 2022). From the project's early stages, I planned and conducted research in exploratory ways that remained sensitive to empirical insights gained over the course of the project. The limited body of prior research in this context made it difficult to predetermine which aspects or relationships would be most important for understanding TEDs' approaches to digital citizenship education. This made methodological flexibility and sensitivity to empirical insights essential.

Thus, across the studies in this thesis, the emergent design allowed for flexibility as to RQs, empirical focus, scope, data generation, and analytical approaches (Morgan, 2008). This emergent quality manifested in different ways. For example, it sometimes warranted sustained research efforts in areas identified as relevant, such as subject content courses in social science TE (Papers III–IV). Other times, it drew attention to unchartered empirical areas, both immediately and gradually over time. For example, the role of TEDs' professional characteristics emerged across Papers II–IV.

This adaptive unfolding of the overall research design is characteristic of emergent design's capability to respond to empirical insights in methodologically principled ways (Hammersley, 2022; Pailthorpe, 2017). TEDs in Paper II frequently referenced social science TE as where digital

citizenship probably is or should be addressed. This result, together with social science education's long-established role for citizenship education, warranted the focused study reported in Paper III. Similarly, both small-scale qualitative studies (Papers II–III) pointed to patterns related to TEDs' disciplinary backgrounds, with likely implications for program enactment. This warranted the mixed-method study reported in Paper IV, which analyzed those patterns at the national level across TEIs.

Emergent design brings both advantages and inherent tensions that require careful navigation (Hammersley, 2022). In this thesis, the approach enabled deep, contextual understanding that developed iteratively and allowed responding to unanticipated research directions, such as the role of disciplinary background that emerged across Papers II–IV. However, this approach risked appearing methodologically unfocused or convenience-driven. I addressed these tensions through continuous reflexivity and revising my thesis RQs with the new insights gained. I maintained theoretical consistency across the studies by adopting the postdigital lens, documenting the empirical rationales for each methodological decision. I ensured that flexibility broadened my empirical understanding rather than simply following opportunities where they presented themselves. The tension between balancing responsiveness to new insights with methodological consistency is particularly evident in my shift from the initial broad focus on subject TE to later concentrating on social science TE. In other words, that this is a thesis about social science TE is part of the clarifying-over-time quality inherent in emergent design. As Hammersley (2022) notes, “research is messy and imperfect business” (p. 61), and it is always a tradeoff between possible research avenues and resources (cf. Merriam et al., 2001).

Consistent with literature on emergent design, I encountered common challenges including time constraints and the need to complement exploratory studies with testing approaches (Hammersley, 2022). In my case, this meant learning new methods as needed, considering previous empirical insights when developing new studies, and complementing qualitative insights with quantitative testing (Paper IV). This builds on the recognition that one sub-study can rarely provide a satisfying answer to a doctoral thesis RQ. It highlights both the role of addressing RQs through multiple studies and the view of empirical studies as part of the broader collective research effort in specific fields (Hammersley, 2022).

Ultimately, this emergent design enabled me to generate the comprehensive understanding required to answer the aim of this thesis. Empirical insights from earlier studies informed decisions for subsequent

investigations, allowing results to be synthesized across multiple papers. Through this iterative process, I developed a multilayered theoretical and empirical understanding of TEDs' approaches to teaching to teach for digital citizenship. This understanding spans from small-scale qualitative depth within key program areas to aggregated national patterns across all Swedish TEIs that prepare social science student teachers.

### ***Entry points into TEDs' work and digital citizenship education***

When I first started developing this thesis, I observed a space within Swedish subject TE, including social science TE, where TEIs and TEDs must translate policy related to digital citizenship education into their dual-didactic teaching, which drew my interest. The term "digital citizenship" does not appear explicitly in Swedish steering documents for TE or secondary education, but such aspects are clearly present. TE degree objectives stipulate that all student teachers, including social science student teachers, need to demonstrate competence and skills (Sw. *färdighet och förmåga*) to "communicate and instill" democratic values, "safely and critically use digital tools in pedagogical work" and "consider the role of different media and digital environments" (SFS 1993:100). Decentralized governance requires TEIs and TEDs to interpret and specify these demands locally. Similarly, national school curricula stipulate that young people develop digital competence to act as citizens, for example, to navigate information streams where digital technologies constitute an important dimension (Swedish National Agency for Education, 2018a, 2018b). These are important control instruments that TEIs and TEDs need to consider for social science TE program design and enactment. Yet what this means in practice is open to interpretation (Fransson et al., 2018).

Given this interpretative space for TEDs' work, I focus in this thesis on how they, within these institutional arrangements, approach teaching to teach for digital citizenship. To do so, I began by considering how digital citizenship conceptualizations could inform TEDs' PDC (Paper I) while simultaneously identifying potential empirical entry points within subject TE programs. I selected the first semester of Core Education Subjects based on both theoretical relevance (its focus on schools' role for democracy) and my familiarity with this context. I had experienced it once as a student teacher, later as a school-based TED with responsibility for practicum, and during my doctoral research as a university-based TED. In Hammersley's (2022, p. 64) terms, this was research within my own society, where I had sufficient familiarity to identify meaningful research

directions. However, my familiarity was not so complete that research efforts in this area would be methodologically problematic or superfluous. This familiarity made the Core Education Subjects study a productive empirical entry point into TEDs' work (Paper II), leading to subsequent studies (Papers III–IV). Meanwhile, through the digital citizenship conceptualizations study (Paper I), I provided a theoretical entry point into digital citizenship literature and operationalized the postdigital lens guiding my empirical engagement.

In other words, using this approach, I generated four interconnected studies that together address the thesis aim. Table 1 (p. 71) provides an overview of the complete research design. This table shows how each paper builds on insights from previous work while addressing distinct aspects of TEDs' approaches to teaching to teach for digital citizenship within institutional arrangements. In the next section, I describe the emergence and execution of each study.

## The emergence of the studies

### ***Study reported in Paper I: Digital citizenship conceptualizations***

Considering TEDs' interpretative space for digital citizenship education, there are influential digital citizenship conceptualizations in the literature which could influence social science TE. For example, such influence may occur directly through education policy or indirectly by being seminal conceptualizations that TEDs likely encounter when seeking theoretical and practical support to teach teaching for digital citizenship.

Therefore, the first study aimed to critically analyze three digital citizenship conceptualizations while simultaneously developing and operationalizing the postdigital lens for empirical application across the thesis. Serving as the theoretical entry point into digital citizenship education literature, this approach linked theory to contexts of TEDs' work. Specifically, the purpose was to analyze what understandings of digital technologies in society the selected conceptualizations implicate, including what knowledge and competences they deem central for citizens. In light of these understandings, the analysis sought to explore the implications for TEDs' PDC.

**Table 1.** Overview of papers, thesis RQ links, purposes, empirical context, generated data, and analytical approaches.

Paper No.	Thesis RQs	Purpose of study	Scope and empirical context	Data generation	Analytical approach
1	RQ1, RQ3	Critically analyze philosophical underpinnings of conceptualizations of digital citizenship and discuss implications for TEDs' PDC to teach teaching for digital citizenship	International Digital citizenship conceptualizations in the literature	Purposive sampling based on review of the literature  Three conceptualizations normative in digital citizenship educational research and policy, October 2021	Qualitative content analysis using profile matrix
2	RQ1, RQ2, RQ3	Explore TEDs' views of digital citizenship and the PDC required to teach for digital citizenship, and implications for their role vis-à-vis such teaching in the Core Education Subjects mandatory for all subject student teachers	National, small-scale: 7 TEIs (28% of main TEIs) Education and Democracy module	Purposive sampling based on course documents  14 course documents specific to 7 courses  16 TEDs interviewed, February–April 2021	Document analysis  Reflexive thematic analysis
3	RQ1, RQ2, RQ3	Explore TEDs' views of teaching for digital citizenship in social science TE, specifically social science TE's role, and conditions for related PDC	National, small-scale: 5 TEIs (26% of main social science TEIs)  Courses covering citizenship, democracy, or digital technologies	Purposive sampling based on course documents  42 course documents specific to 17 courses  15 TEDs interviewed using graphic elicitation technique, April–May 2022	Document analysis  Reflexive thematic analysis, with initial deductive organizational coding for specific analytical focus
4	RQ1, RQ2, RQ3	Examine how TEDs' disciplinary and teaching backgrounds are associated with their views of teaching responsibilities, PDC, and challenges for digital citizenship education, which may have implications for the enacted pedagogy of multi-disciplinary social science TE	National, aggregated: 16 TEIs (100% of main social science TEIs)  Courses covering citizenship, democracy, or digital technologies	Gatekeeper sampling  47 survey respondents (67% response rate), March 2025	Convergent mixed methods with quantitative emphasis integrating descriptive statistics, correlations, regression analysis, Fisher's Exact Test, reflexive thematic analysis, including attention to quantitative code distribution

To select conceptualizations for analysis, I conducted a review of the literature using a purposive sampling approach (Cohen et al., 2018). The aim was to identify publications that were potentially influential in the field. The focus was on 2015–2022, which spans the beginning of the latest critical phase in digital citizenship education scholarship and the time of conducting this study (cf. Richardson et al., 2021). I searched Education Resources Information Center (ERIC), Web of Science, and Google Scholar for books, peer-reviewed articles, and reports in English. Using a broad approach to selection criteria, I considered not only citations but also citation patterns, contexts of origin and use, or if there were other factors making conceptualizations relevant for inclusion. Through this process, I selected three conceptualizations: Ribble’s (2015) nine elements, Choi’s (2016) concept analysis, and Frau-Meigs et al.’s (2017) conceptualization developed for the Council of Europe’s work on strengthening digital citizenship education.

I performed a qualitative content analysis of the selected digital citizenship conceptualizations using a profile matrix approach (Kuckartz, 2014; see below). To make this analysis bounded, the postdigital lens incorporated sociomaterialist insights that focused on selected dimensions derived from postdigital literature (Fawns, 2022; Lamb et al., 2022). These dimensions comprised six aspects that I brought into focus through the postdigital lens. The first two concerned human–technology relations: *Society* (narratives about digital technologies in society) and *Technology* (understandings of technological development and socio-technical relations). The remaining four aspects concerned knowledge and competences citizens need to exercise digital citizenship: *Ideal citizen* (knowledge and ways digital citizenship is exercised), *Context* (relevant spaces for digital citizenship formation), *Critical approach* (attention to power asymmetries in relation to digital technologies), and *Social justice* (challenging such asymmetries through competence development). These latter four aspects reflected postdigital theory’s roots in critical pedagogy (Jandrić, 2021), emphasizing democratic and emancipatory dimensions. These also overlap with other roots such as critical posthumanism and Science and Technology Studies.

Since the six aspects were predefined as analytical categories (phases 1 and 2 in Kuckartz’s approach), I followed the remaining five phases of qualitative content analysis (Kuckartz, 2014). Through an iterative, non-linear process, I: (a) familiarized myself with the publications through multiple readings, identifying core definitions and highlighting content potentially relevant to the six aspects (e.g., phrases, underlying assumptions that discursively convey understandings of digital

technologies in society); (b) performed deductive coding based on the six aspects, approaching coding as critical interrogation rather than neutral description; (c) condensed coded segments into analytical summaries for each aspect; (d) developed case summaries for each conceptualization; and (e) conducted cross-case comparisons in the write-up. The profile matrix facilitated the analysis by enabling systematic interpretation both within and across cases, with aspects organized vertically and conceptualizations horizontally (Paper I, pp. 4266–4268; see also Drisko & Maschi, 2015).

I conceptualized these dimensions as necessary *agential cuts* (Barad, 2007; Murriss & Fullagar, 2021). Such cutting highlights how these dimensions are mutually constitutive with other dimensions that were not included in the analysis and how they are part of indefinite entanglements. As Fawns et al. (2023) observe, the cuts acknowledge that entanglements “do not exist as physical entities (or objects) but as conceptions of invisible relations” (p. 631), created by researchers and thus “the violence that this [cutting] does to our understanding of objects in the world” (p. 629).

Through this analysis, I identified how the three conceptualizations differed in their philosophical underpinnings related to sociotechnical relations, with implications for what TEDs’ PDC to teach teaching for digital citizenship might need to encompass. This critical interrogation provided both a theoretical foundation for understanding digital citizenship in postdigital contexts, and shaped my development and application of the postdigital lens throughout the thesis.

### ***Study reported in Paper II: Core Education Subjects***

As the empirical entry point into TEDs’ work, the purpose of this study was to explore, through a postdigital lens, how TEDs in Core Education Subjects view digital citizenship, the PDC required to teach teaching for digital citizenship, and their role in relation to such teaching. Specifically, the study focused on Core Education Subjects 1–30 ECTS (Sw. *Utbildningsvetenskaplig kärna 1–30 hp*), which constitute the first 30 ECTS of a total 60 ECTS in courses mandatory for student teachers regardless of subject specialization, including social science student teachers. These courses address schools’ role for democracy and thus constitute a key program area where social science student teachers

encounter content related to democracy and the fostering of democratic citizens. Typically, such content is addressed in a five-week module.<sup>10</sup>

Of the 27 TEIs that offer subject TE programs in Sweden, two were excluded in this study because of size, with fewer than five enrolling student teachers per year. From the remaining 25 TEIs, I sent contact requests to seven geographically diverse TEIs of various age and size. The rationale for this selection was to facilitate empirical insight into TEDs' work at approximately a third of the main TEIs. This approach generated richer empirical understanding through diverse institutional arrangements rather than pursuing cross-TEI comparison. It accommodated the thesis project timeframe while ensuring that patterns identified would likely reflect broader trends across Swedish TEIs, although the data cannot decisively support such conclusions.

Using a purposive sampling approach (Cohen et al., 2018), the study focused on TEDs whose teaching in Core Education Subjects included content related to schools' democratic role. To identify such TEDs, I mapped and analyzed TE program and course syllabi using information available on the seven TEI websites, and information provided by gatekeepers, such as directors of studies (Sw. *studierektor*). These gatekeepers also provided relevant TEDs' contact details. In total, I sent interview invitations to 17 TEDs who were relevant for the study (APPENDIX I), and of these 16 ( $N = 16$ ) agreed to participate. Depending on local program structure, the number of TEDs participating from each TEI varied (1, 1, 2, 3, 3, 3, 3). At six of the seven TEIs, one of the participating TEDs had the overall responsibility for this course module on schools' role for democracy.

To develop a deep understanding of TEDs' views, I conducted semi-structured interviews (Brinkmann & Kvale, 2015) using the videoconferencing software Zoom. An interview guide (APPENDIX III) provided consistency across three themes: (1) the digitalization of society, (2) the course module on schools' role for democracy, and (3) digital citizenship, digital competence, and the role of TEDs in teaching to teach for digital citizenship. The guide also included background questions (e.g., experience as TED, personal and professional interest in technology). In this empirical entry-point study into TEDs' work, the interviews

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<sup>10</sup> For readability, I refer to this as the Education & Democracy module in the paper, but this is a construct. Local variation exists in terms of how and when this content is addressed in the first 30 ECTS of Course Education Subjects (see Åstrand, 2020).

concluded with questions particularly related to the postdigital lens, for example, human–technology relations.

Together with the 16 interviews, I collected 14 course documents (224 pages; course syllabi and study guides) which were related to seven courses. From TEIs using a learning management system instead of a document-based study guide, I obtained copies of the contents compiled in one file. I reviewed all collected documents to contextualize the interviews.

I imported the interview transcriptions (238 pages; 16.3 h in total) and collected course documents into NVivo Release 1.5.1 (QSR International), which facilitated, for example, organizing, searching, and coding the data. Following Braun et al. (2019), I performed a reflexive thematic analysis on the data. In this approach to analysis, the researcher generates meaning-based themes rather than “discovers” them in the data. It comprises six iterative, non-linear phases of data familiarization, coding (including splitting/grouping codes), constructing, revising, defining, and writing up sub- and main themes.

Following this approach, the reflexive thematic analysis comprised iterative phases of close-reading and initial deductive coding based on the three interview guide themes. This was followed by more inductive coding (e.g., “digital citizenship–source criticism”). Through these phases, I generated seven subthemes which ultimately formed two main themes: (a) TEDs do not address the democratic assignment in relation to digital technologies; and (b) TEDs’ need for institutional support to address questions relating to digital citizenship (framed, at this stage of the emergent design, as departmental and policy support). Importantly, many TEDs speculated that questions relating to digital citizenship should be addressed in social science TE. When considered together with the history of citizenship education in social science education, this further provided empirical justification for the focused study that became Paper III.

### ***Study reported in Paper III: Social science TE***

The third study shifted the focus to social science subject courses that address citizenship, democracy, or digital technologies. Shifting, narrowing, or expanding the focus based on new insights is characteristic of emergent research design (Hammersley, 2022; Morgan, 2008; Pailthorpe, 2017). Already at the early stages of the thesis project, I identified social science TE as potentially relevant to the thesis given its long history of addressing citizenship education in Sweden. The

interviews in Paper II also indicated that social science TE warranted focused investigation. This is also a particularly relevant empirical context given that social science subject content is responsive to the societal context.

Recent Swedish government initiatives demonstrate this responsiveness by attributing importance to young citizens' development of digital citizenship through educational policy initiatives. Government directives have addressed challenges related to digital citizenship through educational initiatives (Dir. 2018:88; Supplement to Government Decision U2017/04119/S). These initiatives resulted in the 2018 revision of national curricula, with a strengthened emphasis on digital citizenship aspects in social science education.

For TEDs in social science TE, while digital citizenship was already present in education policy, these changes shifted demands as curricula are steering documents that TEDs need to consider in social science TE. A subsequent government report further highlighted TE's key role in providing student teachers, including social science student teachers, with relevant knowledge and competencies (SOU 2020:56). In light of these curriculum changes, TEDs in social science TE need to teach student teachers how to teach for digital citizenship, for example by developing their conceptual understanding and practical knowledge. This provided the rationale for the empirical focus of the third study.

The purpose of this study was to explore TEDs' views of teaching for digital citizenship in social science TE, particularly social science TE's role, and conditions for related PDC. This study sought to deepen empirical understanding at the seven participating TEIs in the Core Education Subjects study, though two TEIs were unable to continue their participation: one did not offer the social science TE program at all, the other had discontinued it.

This reflects the advantages and challenges inherent in emergent design discussed above. While the design allows for sensitivity to empirical insights, this adaptive unfolding can also mean that the research process sometimes takes unanticipated directions. In this thesis, the design facilitated empirical justification for shifting the focus explicitly to social science TE. However, when developing this study, I discovered that two of the TEIs in the previous study did not offer social science TE.

While replacing these two TEIs with others could have contributed to this specific study's robustness in numbers, two key motives supported my

decision against this idea. First, both studies holistically shed light on TEDs' work by focusing on the same TEIs but different program areas. Second, the ratio of selected TEIs-to-all-TEIs in this study (26%) followed that of the Core Education Subjects study (28%).<sup>11</sup> Thus, this balanced the robustness of the overarching thesis design, individual study robustness, project timeframe constraints, and the possibility of identifying patterns that would likely reflect broader trends across Swedish TEIs.

The five TEIs participating in this study were TEIs that prepare social science teachers both for lower and upper secondary school, with the difference mainly being an extra 30 ECTS of social science subject courses. Because of this high level of program integration, I made no distinction related to this in the sampling process or data analysis (an approach repeated in Paper IV; see below).

I used a purposive sampling approach (Cohen et al., 2018) to identify TEDs whose teaching included courses with content related to citizenship, democracy, or digital technologies. I mapped and analyzed social science TE program and course syllabi using information available on TEI websites and information provided by gatekeepers, such as directors of studies. In contrast to the purposive sampling approach in the Core Education Subjects study, which was limited to one specific semester (30 ECTS), this study considered all subject courses in social science TE (two years of full-time studies; 120 ECTS). The necessity of such a broad approach was that social science TE program design may vary locally (Johansson, 2017; Swedish Higher Education Authority, 2020). Given this variation in program design and content, it would not have been possible to focus on one specific social science TE course at all TEIs. To ensure that the included areas of social science TE were relevant to the study, my analysis included study guides provided by the gatekeepers.

I sent interview invitations to 18 TEDs identified as relevant for this study of whom two declined and one did not return any emails or phone calls. In total, fifteen ( $N = 15$ ) agreed to be interviewed on Zoom. Echoing the variation in local TE program structure, the number of participants varied across participating TEIs (1, 3, 3, 3, 5). To better understand the empirical context for the interviews, I collected 42 course documents (322 pages; program and course syllabi, study guides, assignments), which were related to 17 social science TE courses taught by the TEDs included in the

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<sup>11</sup> At the time of data generation, 19 TEIs prepared social science teachers in Sweden, which had changed to 16 when conducting the study reported in Paper IV.

study. The documents served as important contextual material for understanding the institutional frameworks within which these TEDs work.

To develop a deep understanding of TEDs' views similar to the Core Education Subjects study, I conducted semi-structured interviews (Brinkmann & Kvale, 2015) using Zoom except for one in-person interview. An interview guide (APPENDIX VIII) provided consistency across topics in relation to social science TE: digital citizenship in society and schools, TEDs' dual-didactic task and PDC to teach for digital citizenship, and background questions (e.g., TED experience). Based on my experience interviewing TEDs for the Core Education Subjects study, I added the use of graphic elicitation technique to better elicit TEDs' views on digital citizenship given that this term does not explicitly appear in Swedish steering documents (Crilly et al., 2006). Graphic elicitation is a common visual research method that uses visual stimuli to generate rich data regarding informants' interpretations and reflections on their positionality *vis-à-vis* the object of study (Pauwels, 2019). This addition reflected the responsiveness of emergent design. Half-way into the interviews, I presented TEDs with a list I had produced using PowerPoint (Microsoft) that included digital citizenship aspects common in the research literature (APPENDIX IX). This visual stimulus provided a common point of reference and inspired discussions. Given that the term "digital citizenship" does not appear explicitly in Swedish steering documents though such aspects are present, this technique generated data difficult to generate through dialogue alone (Crilly et al., 2006).

The second author and I used NVivo Release 1.7 to perform a reflexive thematic analysis on the transcribed interviews (210 pages; 12.6 h in total). What distinguished this reflexive thematic analysis from the Core Education Subjects study was the collaborative coding approach, which reflexive thematic analysis is compatible with, and the use of initial higher-order codes to focus the analysis on specific data aspects (Nowell et al., 2017). We used these codes to organize data on contents, motives, and conditions related to teaching for digital citizenship in social science TE. Ultimately, this analysis generated 10 subthemes and three main themes: (a) possible pathways; (b) (dis-)embarking on pathways; and (c) navigating pathways in flux. While this study was planned, conducted, and reported together with the second author, I was responsible for sampling, producing the graphic elicitation material, collecting and analyzing relevant documents, interviews, transcriptions, and theme generation.

### ***Study reported in Paper IV: Social science TE at the national level***

The results from Paper III, combined with empirical insights from Paper II, pointed to systematic patterns in how TEDs with different professional characteristics, particularly disciplinary backgrounds, approach teaching to teach for digital citizenship. As these were patterns generated in qualitative small-scale studies, they warranted exploration and analysis at the national scale. This rationale echoes Hammersley's (2022) and Morgan's (2008) points above on emergent design, namely that its responsiveness sometimes requires expanding the focus and complementing qualitative inquiry with testing. As Pailthorpe (2017) argues, emergent design is "interactive and situational" (p. 1). In my case, expansion meant moving from some to all TEIs, while testing involved integrating quantitative and qualitative data with priority given to quantitative data.

Therefore, based on the systematic patterns identified in Paper II and III and in line with the overall emergent design, I aimed in the fourth and final study to explore how TEDs' professional characteristics within institutional arrangements are associated with their views of teaching responsibilities, self-reported PDC, and challenges for digital citizenship education in social science TE. I paid particular attention to AI's increasing importance for digital citizenship education, which emerged during the study period with the release of widely accessible generative AI technologies.

To address these questions at the national scale, I chose a convergent mixed methods design (Creswell & Clark, 2018). This design allowed me to generate both quantitative and qualitative data in a single phase by having TEDs answering a web survey (APPENDIX XIII), using the software Survey&Report (Artologik). TEDs first answered a set of background questions. These included, for example, years of TED experience, whether they had schoolteacher experience, their employment subject (Sw. *anställningsämne*) and primary disciplinary background. Given the complexity of TEDs' disciplinary identities (Goodwin et al., 2014; Loughran & Menter, 2019; cf. Thompson, 2023), I operationalized disciplinary background through a single survey item asking TEDs to self-identify their primary disciplinary background (e.g., educational science, political science). This could have been measured through various indicators (e.g., roles and responsibilities, time in discipline, time since PhD defense where applicable). My operationalization balanced construct validity with survey design considerations (e.g., survey fatigue), while

providing the foundation for the pattern analysis in Paper IV and for future in-depth studies in this area.

The survey consisted primarily of Likert-scale items (strongly disagree–strongly agree), with some tick-box questions and two open-ended questions. I analyzed these data independently before integrating them with priority given to quantitative data. This design facilitated both structured pattern examination (e.g., descriptive statistics, pattern analysis across TEDs’ personal characteristics and institutional arrangements) and nuancing these data with TEDs’ qualitative responses. The integration generated an understanding that neither dataset could provide alone, thereby extending the empirical accounts of Paper II and III (Valeriani & Clark, 2021). In doing so, this design addressed calls for more research on digital technologies in education that combines research paradigms and methodologies (Voogt et al., 2018), particularly mixed methods research on PDC in TE (Røkenes & Krumsvik, 2016).

I based the survey items on the main results highlighted in the discussion sections of Paper II and III, whereas I based the AI related items on a review of relevant literature. The survey prompt encouraged TEDs to consider AI in societal contexts widely: “everything from generating text, audio, and video content to voice agents, self-driving cars, and automated decision-making.”

After completing a first draft of the survey, I discussed its design and items with the research group Measurement in Behavioural Sciences at Umeå University, which has expertise in survey design and quantitative research methods. This discussion informed several revisions of the survey as reported in Paper IV, which helped ensure robustness and fitness for purpose. Examples include clarifications of nominal and scale items to ensure alignment with planned statistical analyses.

When preparing for sampling among the 19 Swedish TEIs with degree-awarding powers in social science TE, I excluded three TEIs as these either had discontinued the program or were in the process of launching it. As in Paper III, the remaining 16 TEIs—all included in the study—had highly integrated programs for lower and upper secondary school social science teachers. I therefore made no distinction related to this in the sampling process or data analysis (repeating the approach in Paper III; see above).

To identify TEDs relevant for this study, I used a purposive sampling approach via gatekeepers (Lamprianou, 2022). This meant that because of considerable social science TE program variation in design and content,

I relied on recommendations from program coordinators (Sw. *programansvarig*), subject directors (Sw. *ämnesansvarig*), or directors of studies to identify TEDs relevant for the study. As in Paper III, I explained my wish to include TEDs whose teaching likely had included citizenship, schools' role for democracy, or digital technologies at any point in the past three years or could come to do so in the future.

This inquiry yielded 80 recommendations of TEDs to include in the study. Due to local TE program design, the number of relevant TEDs differed at each TEI (1–8,  $M = 4$ ). Of these 80 recommendations, ten were TEDs included in Paper III. To prevent sampling bias, I asked these TEDs to pilot the survey since they fit the target group. This pilot ensured clarity and reasonable time to complete the survey. Eight of these piloted the survey (one was on leave, and one did not respond to my contact requests), generating feedback that informed several revisions prior to sending the survey to the remaining 70 TEDs. Most significantly, pilot feedback led to omitting the term “digital citizenship” from survey items. Despite an integrated text clarifying this term at the top of each page, some pilot TEDs found navigating between the definition and the questions confusing. Therefore, the final survey version referred to digital citizenship as “questions related to democratic participation and digital technologies.”

At the end of the survey period, 47 TEDs had completed the survey (67% response rate). Of the non-participating TEDs, five reported unavailability (e.g., on leave) while there were 18 non-responses despite three email reminders.

In the first analytical phase, I exported the generated data from Survey&Report as an SPSS file, which I imported into SPSS29 (IBM) for quantitative analysis. This involved data preparation (e.g., excluding non-responses) and descriptive statistics. Later analyses included creating three construct variables to examine how TEDs' professional characteristics within institutional arrangements were associated with their approaches to teaching to teach for digital citizenship, including PDC. After internal consistency testing using Cronbach's  $\alpha$ , one of these constructs proved particularly useful for more advanced statistical analyses (e.g., Fisher's Exact Tests, regression analysis). These analyses examined *inter alia* relationships between disciplinary background, teaching experience, and self-reported PDC, as well as institutional factors such as program coordination structures.

In the second phase, I imported the “cleaned” SPSS file into NVivo Release 1.7 (QSR International), where I performed a reflexive thematic analysis of TEDs’ free-text responses (Braun et al., 2019). I followed the same iterative, non-linear phases of coding and theme generation as in Papers II–III for theoretical consistency. This analysis generated four subthemes and two main themes: (a) necessity of holistic approaches in AI-infused societies; and (b) navigating resource constraints and evolving PDC needs. What distinguished this analysis from previous reflexive thematic analyses in the thesis was the subsequent integration with quantitative data. After theme generation, I used NVivo’s matrix coding query functionality to generate qualitative–quantitative crosstabulations—a first level of data “mixing.” These crosstabulations facilitated analysis of code distribution patterns across quantitative variables (e.g., self-reported PDC across disciplinary backgrounds; see example in Figure 4, p. 90). In the third and final stage, I integrated these analyses with priority given to quantitative data.

## Ethical considerations

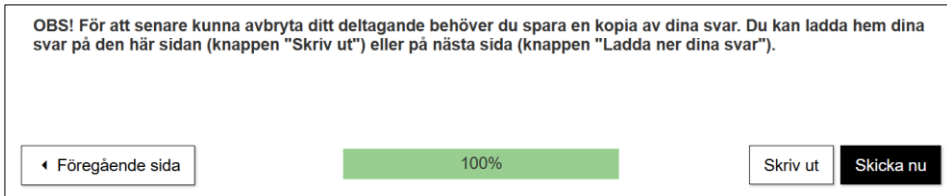
In exploring TEDs’ views across social science TE program contexts, with the help of gatekeepers in key positions, potential benefits must outweigh potential costs and risks (Cohen et al., 2018). Throughout the work with this thesis, I have adhered to the standard ethical principles outlined by the Swedish Research Council (2024). While codices, laws, and regulations provide important frameworks, these are static and need to be applied in empirical contexts (Hammersley, 2023; Tracy, 2010). This thesis is therefore the outcome of my situated choices as a researcher in evolving empirical contexts, iteratively and in line with the emergent research design. Navigating this process, my approach to research ethics has been grounded in the past, present, and future: (a) anticipate risks based on past research; (b) remain sensitive to contextual meaning in the present; and (c) consider the potential impact that my research may have in the future (Markham, 2018). This approach acknowledges that “ethical matters are situated, contestable and context-based” (Cohen et al., 2018, p. 540)—a principle that guided ethical decisions throughout my planning of the research, data generation, analysis, and dissemination across the four studies, including this thesis.

None of the studies included the collection or generation of sensitive data; hence, an ethics approval was not necessary (Regulation 2016/679 [GDPR]; SFS 2003:460). For example, in the interview studies (Papers II and III), my empirical interest was TEDs’ professional views of

pedagogical content and approaches to teaching to teach for digital citizenship in specific TE program areas, with attention to TEDs' role within these program areas, including PDC for such teaching and learning activities. To gain access to TEDs, I consulted gatekeepers such as heads of department, directors of studies, program coordinators, and subject directors (the last two only in Paper IV). While gatekeepers can bar or impose restrictions on the research (Cohen et al., 2018), all were forthcoming in providing contact details without asking anything in return. I also asked that TEDs be contacted by the researcher rather than the gatekeepers to reduce any pressure to participate.

Accordingly, across all studies that involved research participants, I contacted potential participants personally by e-mail (Papers II–III) or through the university-procured survey platform Survey&Report (Paper IV). Each contact request included an information letter (APPENDICES I, VI, XII). In line with the Swedish Research Council's (2024) guidelines, the information to participants described the purpose of the study, that participation was voluntary, that the data would be used for research purposes only, how the results would be presented, and the possibility to opt out at any time without any consequences. This information included questions relating to confidentiality, informed consent, and data management.

Participants' informed consent draws attention to several ethical considerations. For the interviews (Papers II–III), the purpose was to develop a deeper understanding of participants' current views related to the research questions. I therefore provided them with only certain information before the interviews, such as what topics I was interested in rather than the specific questions I wished to ask. Informed consent in these studies raised two important dilemmas: how well participants knew what they agreed to, and whether they felt compelled to continue once involved. One way of handling such dilemmas is continuous informed consent (Allmark et al., 2009). Following this approach, I had participants confirming their informed consent prior to (in writing; APPENDICES II, VII) and at the beginning of the interviews (orally), and I also invited them to comment on the interview transcripts afterwards (APPENDICES IV, X). In the survey study (Paper IV), participants expressed consent by clicking "yes" to begin the survey, accompanied by a pop-up window containing full participant information—the same provided in the survey invitation email—including a reminder to save a copy of their answers should they desire to opt out later. The two final pages of the survey reminded participants to save a copy of their answers (see Figure 2 and Figure 3, p. 84).



**Figure 2.** Screenshot of the original (in Swedish) final page of the survey, with a second reminder to download answers.



**Figure 3.** Screenshot of the original (in Swedish) survey after submission, with a third reminder to download answers.

Across these participant studies, the majority accepted the initial contact request, although some participants first inquired about clarifications. While I received only two such emails regarding the survey (Paper IV), several TEDs particularly in the Core Education Subjects inquired about the focus on digital technologies related to citizenship (Paper II), expressing uncertainty as to whether they were the right person for the study. Such uncertainty could be related to several factors. For example, potential participants may have wondered if and how digital citizenship content should be addressed in their courses and if they were doing it the “right” way, because these courses had apparently drawn my interest as a researcher. A few of these TEDs also worried that their answers might be traceable. They agreed to participate when I reiterated that (a) coding and pseudonymization were used for all data (e.g., file names, transcripts, manuscripts); (b) only data essential for the research were stored; and (c)

given the number of participating TEIs, it would be difficult to trace any individual participant back to a specific institution. After I clarified these concerns, all but one of these TEDs participated. Similarly, in the interview study focusing on social science subject courses (Paper III), one TED eventually declined to participate. The fact that several TEDs inquired about more information and that some declined to participate could be interpreted as signs that they had understood the purpose of the study and conditions for participation.

TEDs generously gave of their time during the survey (Paper IV) but perhaps even more so during the interviews with sessions between 50–80 minutes (Papers II–III), where interview guides helped me ensure consistency. I recorded all interviews digitally and transcribed them verbatim. I emailed transcripts to participants promptly for comments, including a description of the transcription procedure. As TEDs are civil servants, the principle of public access to information in Sweden could grant someone access to their e-mails on request. I therefore sent interview transcripts using encrypted links, active only for a limited time, to help ensure confidentiality. While the majority had no objections, some requested minor revisions prior to analysis (e.g., clarifications, that details be left out to safeguard integrity). For the survey instrument (Paper IV), I consulted with methodological experts (see p. 80 for details). I then piloted it with 8 TEDs to ensure clarity and minimal survey fatigue, which also served to minimize potential participant exploitation given that they were generous with their time answering my survey.

The examples above demonstrate situated ethical considerations as the emergent design developed. Another such aspect concerns the written-up research and confidentiality. I have consistently protected participants' identities in the written-up research through pseudonymization (e.g., referring to "TEDs" or "TED1", "TED2", etc., and not specifying TEI affiliation). A residual risk remains that participants could recognize colleagues, either at their own TEI or others. I balanced this risk with the knowledge contribution on these understudied contexts of TE (cf. Allmark et al., 2009), particularly considering the potential implications for social science TEDs' preparation of student teachers and, ultimately, young people's opportunities in schools to develop digital citizenship and contribute to democratic societies. This risk was further mitigated through translating empirical examples from Swedish into English and through careful selection of which descriptions and examples to include in the papers and this thesis.

### ***Data management***

Umeå University is the research principal that owns the research data on which this thesis is based. In line with my data management plan, registered and iteratively updated in the university-licensed system for data management plans, DMPonline, I have stored all generated data (e.g., audio, documents, NVivo and SPSS files) on a memory stick with an encrypted password in a separate, locked-up compartment throughout the work on this thesis.

## Methodological reflections

### ***Positionality and reflexivity***

Positionality and reflexivity are two interconnected concepts central to the research process. Positionality addresses how researchers' views and stances toward their work relate to their worldviews and the social and political contexts in which research takes place (Holmes, 2020). Researchers' values, beliefs, and entanglement with the world may shape the research both from the project's outset and during work, requiring continuous reflexivity. Such reflexivity acknowledges that researchers inevitably engage in the social worlds they explore and analyze, worlds that have already been given meaning by those who inhabit them (Holmes, 2020). The postdigital lens adds further dimensions to this reflexivity. Researchers engage in social worlds and in assumptions about these worlds' relationship to the digital: technologies "not (obviously) human, but that impact on humans and each other" (Hayes, 2023, p. 4). In other words, researchers engage in a reality both technological and ideological (Feenberg, 2019).

An important concern throughout this research has been power relations between me as a researcher and my research participants. While power relations are inherent in the survey design and deployment, for example, regarding the risk of bias (Paper IV; Cohen et al., 2018, p. 476), they were particularly tangible during the interviews (Papers II–III; Kvale, 2007). While interacting in my capacity as a researcher, I may have been perceived more collegially: as a fellow TED, researcher, or former schoolteacher. There is thus the risk that participants unexpectedly disclosed details not shared otherwise. This may also have worked the other way around. Despite clarifications of my research interests, I may have appeared as someone with a set idea about digital technologies in education or as evaluating their teaching approaches, influencing how the interviews unfolded.

One way of balancing the power dynamics between researcher and participants is by giving something back (Allmark et al., 2009). In the interviews, I concluded each session by inviting the participants to reflect on whether the interview had sparked any thoughts, and many expressed that they had gained new insights or wanted to learn more, requesting, for example, literature recommendations. I also kept participants informed about research outcomes after the interviews, notifying them when papers were published and where I had presented results (APPENDICES V, XI). As to the use of graphic elicitation (Paper III), this technique can affect the interview situation by drawing attention to specific topics and understandings of these, thus introducing bias (Pauwels, 2019). However, it can affect the power distribution positively by providing a common point of reference between the interviewer and the participant (Crilly et al., 2006). While the latter reflects my experience, I acknowledge that participants may have experienced this technique differently.

Moreover, I have explored and analyzed TE contexts which, at the outset, I was both familiar with and distanced from, but over time this familiarity has grown. I began as a fresh doctoral student and TED, with a budding research interest in TE, democracy, and digitalization. This interest built on but differed from what I had cultivated for more than a decade in lower and upper secondary schools as a teacher, with a certification in English and history. While I did not teach social science education, I worked closely with those teachers through co-teaching in cross-subject projects. I had also acted as a school-based TED supervising student teachers during practicum and participated in projects related to digital technologies in teaching and learning. Thus, I began this thesis project not as *tabula rasa* but with prior knowledge, understandings, and experience from the professional context for which TEDs prepare student teachers. This reflects how doctoral students in Educational work typically have a schoolteacher background due to enrollment requirements. As Svedberg and Granstedt (2023) remark, this places demands on reflexivity, transparency, and research dissemination in “making the known unknown” (p. 75, my translation).

This reflexive stance aligns with the emphasis on self-criticality in critical educational research involving digital technologies (Decuyper et al., 2025). It continuously involves examining the implications of power structures in which digital technologies are entangled within and beyond social science TE and schools, and how my own analytical choices and professional background may shape what becomes visible in the research.

Over time, I have gained experience, both as a TED and a researcher, making me increasingly familiar with the institutional arrangements within which TEDs work. This experience reflects how TEDs' work oftentimes is dialectic across research and practice (Cochran-Smith, 2005). As my experience has developed over the project, my status as "insider" and "outsider" has shifted temporally and situationally, not in a linear way but simultaneously: as multiple insider–outsider statuses or positionalities (Holmes, 2020; Merriam et al., 2001). Altogether, this dynamic quality of experience—accumulated prior to and during the thesis project—has likely been helpful. Examples include establishing rapport, understanding empirically the contexts that TEDs navigate in teaching and learning, and formulating and addressing well-informed research questions. At the same time, this experience and prior understanding may have affected at different points the questions I asked and thus the answers I received, including my interpretations of data. To balance this, I have sought to reflect continuously on my role as a researcher, what perspectives I take and in which capacity, with respect for my research participants and how I generate and report data (Korstjens & Moser, 2018).

These insider–outsider positionings also relate to my epistemological approach. My insider status facilitated emic understanding of how TEDs themselves conceptualize and make sense of their work in their own terms (Merriam et al., 2001). At the same time, I brought etic analysis through my theoretical framework, particularly postdigital theory and, to some degree in Papers I–II, existing PDC conceptualizations. These frameworks enabled me to situate TEDs' empirical accounts within postdigital contexts, respecting their own descriptions. I could then analyze how they approach teaching to teach for digital citizenship in environments where citizenship education and the digital are entangled. This approach allowed me to identify patterns and examine dynamics across diverse institutional arrangements that individual participants might not articulate.

Another aspect concerns the use of online video conferencing software. The Covid-19 pandemic was ongoing during the first empirical study and partially during the second. Visiting restrictions prompted the use of the university-licensed software Zoom to interview TEDs, with the exception of one who preferred an in-person interview once restrictions eased (Paper III). Online interviews can take different forms (Cohen et al., 2018). Using Zoom facilitated, for example, both dialogue and the use of graphic elicitation through screen sharing (Paper III). I acknowledge, however, the ongoing research discussions on the advantages and disadvantages of Zoom interviews (Archibald et al., 2019), and that the

medium may have affected the interviews and thus the reported research since “The human qualities so important to interview communications are experienced differently” when using Zoom (Salmons, 2012, p. 2). While I did not experience any significant technological glitches or establishing rapport to be a problem, participants’ experience may have been different. However, they seemed comfortable using Zoom, which may relate to their accumulated experience with Zoom during the pandemic. Through the flexibility of Zoom use, travel was kept at a minimum while participants connected with me from locations and at times suitable to their schedules. Some wanted to share their screen to show course content or their learning management systems, which offered insights into their approaches to teaching to teach for digital citizenship. This flexibility would have been more difficult to achieve in in-person interviews.

Beyond interview medium, reflexivity also extends to how I as a researcher interpret and report data (Mertens, 2014). This includes my use of computer-assisted qualitative data analysis software such as NVivo (Papers II–IV). Visually appealing software renditions can shape data interpretation, or make claims seem more substantiated than they are: that software somehow improved the research, which erroneously attributes agency to the software (Flick, 2018). This could be said also about statistical output in SPSS, and possibly even more so in mixed methods when integrating data *across* SPSS and NVivo (Paper IV; see example in Figure 4, p. 90). In the written-up research, I have therefore sought to be transparent regarding my use of data analysis software (Paulus et al., 2017).

### ***Trustworthiness***

Hammersley (2023) emphasizes the difference between “the aim of research and the motives we may have for engaging in it—between what we set out to produce in doing research (knowledge), and the reasons why we think producing knowledge of the kind intended is worthwhile, what we hope we will achieve by doing this” (p. 9). As I stated in the Introduction chapter (p. 14), my motives for this research are not merely that these contexts are understudied, but that the development of young people’s democratic capabilities depends critically on the work of TEDs in social science TE. However, the trustworthiness of the knowledge generated through this thesis rests not on my motives but on the rigor with which I conducted the research. Trustworthiness fundamentally concerns one question: “How can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to, worth taking account of?” (Lincoln & Guba, 1985, p. 290).

Codes based on free-text answers

Disciplinary background

Number of coded segments

Category of TEDs reporting HIGH digital citizenship PDC

TED	Digital citizenship PDC: HIGH			
	Educational science	Sociology	Political science	Other
Assessment issues	1	0	0	0
Digital citizenship skepticism	1	0	0	0
Holistic approach necessary	8	2	2	4
Policy support	2	0	0	1
Students' digital competence with AI	3	0	1	1
TEDs' needs	2	0	2	0
Time vs. content	0	1	0	1
<b>Total (unique)</b>	8	2	2	4

Number of TEDs from each discipline reporting "HIGH" PDC

**Figure 4:** Example of NVivo crosstabulation showing distribution of free-text response codes across disciplinary backgrounds among TEDs reporting high PDC (Paper IV).

Trustworthiness thus refers to quality criteria for qualitative research, which differ from quantitative research where concepts such as replicability are more common (Stahl & King, 2020). Scholars have developed numerous approaches to establishing such trustworthiness, but the core concern remains whether results warrant readers' confidence and action (Tracy, 2010).

I pursued trustworthiness through several strategies. Throughout this thesis, I have sought to compare alignments and tensions between my research and the existing literature, not rejecting unexpected turns (Hammersley, 2023) but being open to repositioning my arguments (Hayes, 2023). This is in line with my acknowledgment that trustworthiness is not straightforward but develops with research experience (Stahl & King, 2020), which in this thesis spans several years, social science TE program areas, and TEIs.

Across these areas, I have generated various types of data, bridging analyses of documents, interviews, and mixed method data to develop rich, trustworthy empirical accounts in relation to the thesis aim and RQs. I have involved other researchers beyond my supervisors in multiple ways, such as research disseminations at conferences and online, research visits in Sweden and abroad, and research collaborations. Through these engagements, I have continually gathered feedback that supported my reflexive process and strengthened the research. This has further promoted the trustworthiness of my research results, as has having papers subjected to double-blind peer-review for international conferences and scientific journals. I have also kept a research notebook throughout this research, documenting analytical reflections and possible avenues for thesis development, which constitutes an audit trail of decisions made.

The multi-level analytical approach across the four studies also strengthens ecological validity: the extent to which results reflect authentic contextual complexity (Gehrke, 2018). It evolved from digital citizenship conceptualizations and small-scale qualitative depth with thick descriptions (Papers I–III) to quantitative breadth with mixed methods at the national scale (Paper IV). This study both corroborated patterns from the small-scale studies and explored their variation across TEDs' professional characteristics within institutional arrangements, while also drawing attention to emerging AI dimensions of digital citizenship education. This design enables systematic examination of patterns and dynamics across social science TE program areas and TEIs. It generates a broader understanding of TEDs' dual-didactic approaches

to digital citizenship education within institutional arrangements by showing where TEDs' approaches are consistent and where they vary.

Moreover, transparency and coherence were central to my analytical approaches. I employed methods that align with a reflexive stance. This includes reflexive thematic analysis (Papers II–IV), which foregrounds researcher subjectivity and self-reflexivity, in contrast to approaches focusing on generalizability and replicability, such as post-positivism (Braun et al., 2019). Similarly, the mixed methods approach in Paper IV was not triangulation to approximate a post-positivistic “truth,” but aimed to develop a richer empirical understanding by integrating data types. The profile matrix approach in Paper I, while deductive, also supported continuous reflection given its nonlinear and iterative form. Across all approaches, I have striven toward “thick” descriptions, rich in empirical accounts and context, supporting transferability assessments (Tracy, 2010). This approach enables so-called naturalistic generalization, where readers draw on their own experience and tacit knowledge to determine the relevance of results to their own settings.

### ***Limitations and paths not taken***

Within the resources allocated for this thesis project, it is important to acknowledge that the studies including TEDs (Papers II–IV) focused on courses addressing citizenship, democracy, or digital technologies—the courses most relevant for digital citizenship education in social science TE. While Papers II–III are grounded in an analysis of all program syllabi as part of the purposive sampling approach at the included TEIs (i.e., all their syllabi for the Core Education Subjects, 1–30 ECTS, and all syllabi for the social science TE subject content courses), it could be that other TEDs at these TEIs address relevant content informally in courses not explicitly focused on these topics. This means the thesis builds on explorations primarily into formalized, explicit content areas for digital citizenship education rather than informal practices. Additionally, the purposive sampling captured TEDs' work within these specific courses without examining their broader teaching responsibilities, professional identities, or the proportion of their workload devoted to social science TE. The results thus represent TEDs' approaches in particular course contexts rather than complete professional profiles. Regarding Paper IV, there are three important limitations. Because of scale, the paper relies on gatekeepers' recommendations which may have been more or less exhaustive. As the survey instrument did not register potentially compromising details (e.g., name, TEI affiliation), it is not possible to assess with certainty what the TEI representation actually was relative to

the group of TEDs recommended for the study. Moreover, interview and survey data can be biased in different ways. As Tracy (2010) remarks, “research participants may espouse very different values in interviews than the values they enact in contextual interactions—with both sets of data being equally ‘true’” (p. 843). I would add that this applies also to their survey answers.

At an early stage of this thesis, I also explored the idea of conducting a multiple-case study design. The research focus was still developing, including questions about whether to focus also on student teachers, and the balance between focusing on subject TE more broadly (reflected by Papers I–II) or specifically on social science TE. At the one-year seminar, however, feedback challenged the assumptions underlying this design, particularly given the exploratory nature of the research and what would comprise a comparative case across these diverse TE contexts. Consequently, I shifted to the emergent design approach described above, which better accommodated the iterative development of understanding across the four studies and enabled the research to respond to patterns emerging from the data rather than imposing a predetermined comparative structure.

Some of these patterns indicated the relevance of interviewing program coordinators (Papers II–III) and exploring student teacher perspectives (Paper II). Program coordinators could provide important perspectives given how TEDs reportedly rely on them to ensure that digital citizenship content is covered, for example. Student teachers could provide perspectives on how TE has equipped them for digital citizenship education, including data on how TE preparation translates into changes in student teachers’ practices in school classrooms, not just changes in views (Cochran-Smith et al., 2015). While worthwhile research pursuits, I decided against these given the thesis’s emergent focus on TEDs within institutional arrangements.

Relatedly, I explored the idea of complementing interview studies in the thesis by conducting a university classroom-based observation study. Particularly, I considered focusing on examples of good practice regarding teaching to teach for digital citizenship in social science TE (Kelchtermans, 2015), and how these could inform, for example, professional development initiatives. I discussed this idea with my supervisors and colleagues, for example, at the 2023 National Conference for Educational Work in Norrköping, Sweden, where I received helpful suggestions. Classroom observations could have captured TEDs’ enacted PDC related to digital citizenship education, complementing the self-

reported data generated through interviews and surveys. However, considering the overall research design, the empirical justification was stronger for the study that ultimately became Paper IV given the systematic patterns identified in Papers II–III that required national-scale examination. This design choice also served to promote balance in the overall contribution of the thesis between empirical depth (mainly qualitative, small-scale based results) and breadth (mixed methods with quantitative priority, national-scale results).

### ***Chapter summary***

In this thesis, the emergent research design enabled me to develop a comprehensive, multi-level understanding of TEDs' approaches to teaching to teach for digital citizenship within institutional arrangements. This understanding emerged through four interconnected studies that developed organically as I gained theoretical and empirical insights, progressing from qualitative depth to mixed methods breadth at the national scale. In the chapter, I have also reflected on ethical considerations, positionality and reflexivity, trustworthiness, and limitations of the research. In the next chapter, I summarize the results of each of these studies.

# Summary of papers

In this chapter, I provide summaries of Papers I–IV included in the thesis. The focus is on key results and knowledge contributions in relation to the thesis RQs. These summaries prepare the ground for the synthesizing Analysis and discussion chapter that follows.

## Paper I

Örtégren, A. (2024). Philosophical underpinnings of digital citizenship through a postdigital lens: Implications for teacher educators' professional digital competence. *Education and Information Technologies*, 29(4), 4253–4285. <https://doi.org/10.1007/s10639-023-11965-5>

Paper I critically analyzes three influential digital citizenship conceptualizations—Ribble, Choi, and Frau-Meigs et al.—examining their philosophical underpinnings and implications for TEDs' PDC. Through a postdigital lens operationalized via profile matrix analysis, the paper addressed the following RQs:

- What philosophical underpinnings do the conceptualizations of digital citizenship have related to socio-technical relations between humans and digital technologies?
- In light of these underpinnings, what are the implications for TEDs' PDC to teach teaching for digital citizenship?

Addressing RQ1 and RQ3 of the thesis, the analysis shows fundamental differences across the three conceptualizations in knowledge and skills important for citizens to develop and sociotechnical understandings. These differences range from instrumental human-centered approaches underpinned by technological determinism to postdigital understandings recognizing digital technologies and social practices as entangled. Related to TEDs' PDC, these philosophical differences would have implications for their approaches to teaching to teach for digital citizenship. Conceptualizations building on instrumental approaches position digital technologies as neutral tools that citizens learn to “use responsibly,” whereas conceptualizations that engage postdigital contexts recognize technologies as embedded in political, economic, and social contexts that actively shape citizenship itself.

TEDs' PDC requires critical conceptual understanding of these underpinnings across various dimensions, not merely technical or pedagogical competencies. This includes PDC to trouble narratives of people as mere “users” of digital technologies and to consider what technologies can do with or against people. Given citizenship's in-flux character in postdigital contexts, temporal qualities and plasticity emerge as essential dimensions of PDC. Transformative agency may be another such dimension, supporting TEDs in transforming unexpected situations into meaningful learning opportunities for student teachers rather than relying on static frameworks. Given the diverse paths toward becoming a TED in Sweden and globally, a possible way forward could be policy support to support such PDC among TEDs, but this also raises questions such as what digital citizenship conceptualizations should inform TEDs' PDC.

For social science TE, systematic professional development initiatives can support TEDs' dual-didactic task for digital citizenship education. Such initiatives can support TEDs in helping student teachers understand how technologies are inherently political with implications for society and education. The paper recognizes the value of discussing TEDs' PDC in teacher-centered ways but emphasizes the importance of acknowledging how PDC emerges from shifting entanglements of education, democracy, and broader societal structures. Such a holistic, ecological view of PDC demands attention not only to what is “in there” (within TEDs) but what is “out there” (contexts in which digital citizenship education unfolds).

## Paper II

Örtégren, A. (2022). Digital citizenship and professional digital competence — Swedish subject teacher education in a postdigital era. *Postdigital Science and Education*, 4(2), 467–493. <https://doi.org/10.1007/s42438-022-00291-7>

Paper II explores how TEDs approach teaching to teach for digital citizenship in Core Education Subjects, the mandatory program area addressing schools' role for democracy across all subject specializations. This includes how these TEDs view digital citizenship, related PDC, and implications for their professional role. Through interviews with 16 TEDs across seven TEIs and analysis of 14 course documents, the paper addressed:

- How do TEDs view digital citizenship and the PDC required to teach for digital citizenship?
- What are the potential implications for TEDs' role in preparing subject student teachers to teach for digital citizenship?

Contributing to RQ1–R3 of the thesis, the analysis shows three key patterns. First, regarding conceptualizations, TEDs generally acknowledge digital citizenship's importance for schools' democratic role and its implications for TE program enactment. However, their approaches reflect PDC with varied conceptualizations of digital citizenship. Predominant were source criticism, ethics, and democratic participation, with limited responsiveness to postdigital contexts. Second, some TEDs expressed postdigital understandings of digital technologies' permeation of society, yet they often reverted to narrow conceptualizations when discussing TE content. Digital citizenship education then centered on “the web” and access to purpose-built tools rather than entangled sociotechnical relations.

Third, regarding professional roles and institutional arrangements, course syllabi and study guides contained few explicit links between schools' democratic role and digital technologies that could structure digital citizenship education institutionally. TEDs highlighted uncertainty about whose responsibility it is to address digital citizenship, particularly the distribution between Core Education Subjects and social science subject courses. A challenge is also rapid societal change, making it difficult to keep up professionally and institutionally with developments in digital citizenship. Some TEDs, often with disciplinary backgrounds outside educational science, questioned whether teaching for digital citizenship was a part of their professional role and responsibilities, arguing that anyone could teach it since it requires no specialized PDC. TEDs reportedly approached digital citizenship in their courses on an ad-hoc basis, with only a few claiming substantive engagement.

Given TEDs' general agreement on digital citizenship's importance despite uncertainty about responsibility, I argued that policy support could provide clearer linkages between TE degree objectives concerning digital technologies and fostering democratic citizens. Such support could guide TEDs' work through purposeful resource allocation, professional development initiatives promoting deeper conceptual understanding, and clearer responsibility distribution. As many TEDs asked, who is responsible for this—because someone *has to be* given digital citizenship's importance in TE, indicating program coordination challenges at some

TEIs. This variation in conceptualizations and approaches raises questions about equivalence both in how TEDs teach teaching for digital citizenship within and across TEIs, and the institutional arrangements shaping their dual-didactic teaching.

## Paper III

Örtengren, A., & Olofsson, A. D. (2024). Pathways to professional digital competence to teach for digital citizenship: Social science teacher education in flux. *Teachers and Teaching*, 30(4), 526–544. <https://doi.org/10.1080/13540602.2024.2342860>

Paper III shifts the focus to how TEDs approach teaching to teach for digital citizenship in social science subject courses. Building on the results from Paper II on Core Education Subjects, this paper explores how TEDs navigate between written and performed education policy for digital citizenship education, attending to social science education's responsive character. Through interviews with 15 TEDs across 5 TEIs and analysis of 42 course documents, the paper addressed:

- According to TEDs, what is social science TE's role in teaching for digital citizenship?
- How do TEDs describe conditions for their PDC to teach for digital citizenship in social science TE?

Addressing RQ1–R3, the analysis demonstrates both continuities with Paper II and new insights specific to subject courses in social science TE. Regarding motivations and roles, TEDs expressed strong incentive for fostering knowledge and skills to teach for digital citizenship, motivated by their dual-didactic task and social science content's inherent societal responsiveness. Regarding conceptualizations, source criticism remained predominant also in this subject-specific context. While source criticism has a central role in the school subject, it proves insufficient if the goal is citizenship education that reflects the entanglement of young people's democratic and digital capabilities. As in Paper II, TEDs expressing postdigital understandings of digital citizenship reverted to narrow conceptualizations when reflecting on these specifically in teaching and learning, falling back on source criticism rather than addressing sociotechnical entanglements.

A critical result concerned the gap between first-order and second-order teaching. TEDs expressed higher PDC to teach digital citizenship content

compared to lower PDC for dual-didactic teaching. As democracy requires constant renegotiation, citizenship education addresses both the present and the unknown future. Therefore, such education cannot rely on content delivery models alone. Professional development initiatives are an important part of institutional arrangements. These require adaptation to TEDs' professional characteristics, particularly their sociotechnical views, to promote deeper entangled understanding of digital citizenship rather than treating it as add-on content to cover. Additional institutional arrangements shaping these approaches include high teaching loads and, more importantly, uncertainty about who addresses digital citizenship within social science TE. TEDs reported relying on colleagues and program coordinators, pointing to deeper challenges regarding what different disciplines contribute to the program.

While broader program audits emerged as a possible way forward, implications for TE policy appeared less clear. Stronger policy could provide guidance, yet TEDs generally viewed such support as either unhelpful or already in place. To understand this dynamic, the paper draws on Lipsky's (2010) concept of street-level bureaucracy, which focuses on frontline professionals' exercise of discretion when implementing policy. As street-level bureaucrats, TEDs mediate between written policy (TE degree objectives, national curricula) and "policy as performed" (Lipsky, 2010, p. xvii), that is, their professional interpretation when enacting teaching and learning. The paper concludes by questioning whether demands on PDC characterized by plasticity and temporality are greater in social science TE than in other TE programs, given the in-flux character of digital citizenship and social science content.

## Paper IV

Örtengren, A. (under review). Teaching for digital citizenship in AI-infused societies: How social science teacher educators' disciplinary backgrounds relate to professional digital competence across Swedish institutions.

Extending the focus of Papers II–III to a national scale, Paper IV explores how TEDs across all 16 Swedish TEIs preparing social science student teachers approach teaching to teach for digital citizenship. Through a mixed-methods survey ( $N = 47$ ; 67% response rate) integrating quantitative and qualitative data, the paper addressed:

- What patterns emerge across TEDs' disciplinary and teaching backgrounds in relation to their views of teaching responsibilities, PDC, and challenges for teaching for digital citizenship?
- In light of RQ1, what patterns emerge specifically related to AI?

Addressing RQ1–R3, the analysis demonstrates systematic national patterns corroborating and extending Papers II–III. TEDs overwhelmingly agree (95.8%) on digital citizenship's importance in social science TE. Yet considerable variation exists in approaches and PDC, particularly translating content knowledge to responsive pedagogies in postdigital contexts. Relatedly, regarding PDC challenges, TEDs reported declining PDC from content (83%) through teaching and learning (61.4%) to AI aspects (48.9%). This result corroborates Paper III's identification of the gap between content and dual-didactic teaching. Regarding conceptualizations, source criticism, democratic participation, and AI's role for democracy emerged as the most common across TEDs' professional characteristics.

Disciplinary background patterns proved important. TEDs from educational science reported significantly higher PDC for both content and dual-didactic teaching, demonstrating postdigital understandings of how AI entangles with democratic practices. In contrast, TEDs from political science reported significantly lower PDC, positioning digital technologies as secondary to core content knowledge and questioning whether such teaching falls within their responsibilities. TEDs outside educational science also located challenges primarily in TE policy rather than resources. Given that 49% of responding TEDs came from political science, these patterns raise critical questions about student teachers' opportunities to engage with TEDs' role-modeling of digital citizenship education in social science TE classrooms.

Schoolteacher experience emerged as even more important than disciplinary background for PDC, though this analysis was complicated by all TEDs from educational science having schoolteacher experience. In contrast, TED experience proved unimportant as a predictor. These results suggest that practical teaching experience may better equip TEDs to navigate the in-flux character of citizenship content in postdigital contexts than disciplinary training alone.

The institutional arrangements shaping these patterns were complex. 51.1% of TEDs expressed uncertainty about whose responsibility it is to address digital citizenship, echoing the responsibility ambiguity identified

in Papers II–III. Neither TEI organizational structure (central vs. distributed program responsibility) nor program structure (embedded vs. separate teaching and learning courses) showed significant effects on approaches to digital citizenship education. At the same time, only 46.9% reported sufficient departmental support. These results highlight the importance of a clear vision for digital citizenship and TEDs’ PDC and effective program coordination to support their integration into social science TE. Many TEDs emphasized needs for professional development (68%), particularly collegial collaboration and workshops, alongside challenges including high teaching loads and access to relevant literature and technology.

Paper IV’s results indicate that responsive digital citizenship education requires institutional initiatives beyond simply reorganizing teaching responsibilities. At some of these TEIs, one department (or discipline) is responsible for subject courses where digital citizenship content suitably could be addressed, while elsewhere TEDs contribute from across such organizational boundaries. Neither approach showed significant effects on digital citizenship education, although the data do not allow examinations of the degree of coordination. Thus, rather than assuming structural changes alone will resolve the challenges Paper IV identifies—reflecting results from Papers II–III—the key question is how different TEI orchestrations *can enable* TEDs with varied professional characteristics to collaboratively enrich student teachers’ preparation.

# Analysis and discussion

With democracy under pressure globally, including democratic backsliding, rapid sociotechnical shifts like AI, and eroding boundaries between digital technologies and democratic life, teacher preparation for digital citizenship has arguably not been more critical. In such postdigital contexts, TEDs face urgent challenges in preparing student teachers for digital citizenship education. As social science education holds particular responsibility for developing young people's citizenship capabilities, TEDs' preparation of student teachers in social science TE is crucial for how schools support young people's democratic participation. This responsibility intensifies as policy shifts in countries like Sweden risk diminishing digital citizenship education across TE and schools. Understanding how TEDs approach teaching to teach for digital citizenship amid these challenges is critical, yet such systematic knowledge remains limited. This is particularly acute given that they must navigate both evolving subject content responsive to these sociotechnical shifts, and the dual-didactic translation of that content into pedagogies supporting student teachers' future practices in schools. Swedish TE's decentralized governance means substantial interpretative space for how TEDs approach this work, where professional characteristics and institutional arrangements that shape their approaches remain poorly understood. This thesis contributes knowledge on how TEDs in social science TE approach teaching to teach for digital citizenship within these institutional arrangements, with attention to content, professional roles and responsibilities, and capabilities for teaching that content.

Against this backdrop, I examine three interrelated RQs in this thesis:

1. How do conceptualizations of digital citizenship, as part of teacher educators' professional digital competence, engage with the postdigital contexts in which social science teaching and learning is situated?
2. How are teacher educators' professional characteristics and institutional arrangements associated with their approaches to teaching for digital citizenship in postdigital contexts?
3. What are the implications for developing professional digital competence to teach for digital citizenship in social science teacher education in postdigital contexts?

Answering these RQs requires synthesis across conceptual, professional, and institutional dimensions. This reflects a core premise of the thesis: understanding the enacted pedagogy of social science TE requires establishing what digital citizenship entails conceptually, how TEDs navigate this work professionally and institutionally, and what these patterns signal about developmental needs for individual TEDs and institutional arrangements across TEIs. The analysis proceeds through four main sections. Three sections each address one RQ and related conclusions. First, I focus on how conceptualizations of digital citizenship engage with postdigital contexts, addressing tensions within theoretical frameworks and TEDs' PDC (RQ1). Second, I focus on how professional characteristics and institutional arrangements shape TEDs' approaches to teaching for digital citizenship, with attention to roles, responsibilities, and capabilities (RQ2). Third, I focus on implications for developing PDC that is responsive to postdigital contexts (RQ3). Finally, I synthesize contributions across the RQs and situate them within current developments affecting Swedish TE, with implications for policy and practice.

Throughout these sections, I integrate analysis and discussion rather than separating them, as synthesizing across papers generates insights beyond individual contributions. This synthesis is enabled by the thesis's emergent design, from small-scale qualitative depth to national-level corroboration and nuancing, making this the first comprehensive study of digital citizenship in Swedish social science TE, with relevance for Swedish TE more broadly and implications extending to international TE contexts.

## Engaging postdigital contexts: between concepts and pedagogies

RQ1 focused on how conceptualizations of digital citizenship, as part of TEDs' PDC, engage with the postdigital contexts in which social science teaching and learning is situated. Addressing RQ1, this thesis demonstrates that while conceptualizations of digital citizenship have different philosophical underpinnings with varying degrees of postdigital awareness (Papers I–IV), TEDs' approaches to translating conceptual understanding into pedagogical practices vary (Papers II–IV).

### Theoretical conceptualizations of digital citizenship

PDC supports TEDs' dual-didactic task—teaching others how to teach related to digital technologies—an area of TEDs' profession requiring

more research (Arstorp et al., 2024; Lindfors et al., 2021; Uerz et al., 2018). Results from paper I's analysis of theoretical conceptualizations of digital citizenship demonstrate a wide spectrum of approaches, where not all align with postdigital understandings. Echoing the studies by Heath (2018) and Richardson et al. (2021), the conceptualizations examined range from static to "always-in-the-making" (cf. Biesta & Lawy, 2006). Each emphasizes different digital citizenship subject content. Discursively, these framings convey different understandings of human–technology relations, from technological determinism and instrumentalism to entangled understandings of sociotechnical environments (Jandrić & Knox, 2022). Given their status, these conceptualizations could shape TEDs' PDC and practice (Paper I; cf. Almås et al., 2021). The potential influence of such framings becomes particularly tangible in social science subject content's in-flux responsiveness to societal contexts (Campbell et al., 2012; Sandahl, 2018). With generative AI reconfiguring how young people act and engage with information (Swedish Internet Foundation, 2025a), TEDs must prepare student teachers for contexts where instrumental approaches risk what Johnson and Verdicchio (2017) describe as "sociotechnical blindness" (p. 2268). As Swedish TEDs report uncertainty about their own PDC to address AI (Velandar et al., 2024), this blindness risks obscuring how AI entangles education, climate impact, corporate interest, low wage labor predominantly in the Global South, and its broader relations to societal structures of power and injustice (Emejulu & McGregor, 2019; Mishra et al., 2025; Selwyn, 2022). How these conceptualizations inform TEDs' PDC shapes what preparation student teachers receive for supporting young people's entangled democratic–digital capabilities.

### Teacher educators' conceptualizations of digital citizenship

The variation in theoretical approaches is reflected in how TEDs approach digital citizenship, though with important differences in how conceptual understanding translates into pedagogies. TEDs largely default to source criticism both broadly (Papers II–III) and when considering AI (Paper IV). This pattern persists despite common postdigital acknowledgment that digital technologies are embedded in people's lives. While important, such emphasis risks limiting digital citizenship to responsible use approaches that scholars critique as conceptually narrow (Heath, 2018; McCosker et al., 2016). Source criticism's prevalence is unsurprising in subject courses given its strong historical presence in social science education (Bronås & Selander, 2002). TEDs teaching Core Education Subjects shared this focus but emphasized different dimensions, such as ethical considerations (Paper II). TEDs teaching subject courses generally

expressed more holistic understandings of digital citizenship, such as entanglements of AI, society, and democratic participation. This result echoes Hjukse et al. (2020), who found that TEDs engage more with PDC in social science TE than other programs. However, conceptual variation exists among TEDs within this multidisciplinary group (Papers III–IV), and I explore this variation further in RQ2. These conceptual differences in PDC warrant program-wide discussions to ensure integration, progression, and shared responsibility across the TEI—a coordination approach emphasized in recent TE research (Gudmundsdottir et al., 2020; Pedersen et al., 2024; Tondeur et al., 2025).

This variation also highlights how sociotechnical understandings underpinning TEDs’ PDC engage with the postdigital contexts for their dual-didactic task. Small groups of TEDs in different program areas (Papers II–III) acknowledged digital technologies’ role for democracy yet argued these phenomena lack digitally-related implications for citizenship education. Such conceptual understandings likely shape how these TEDs approach role-modeling teaching for digital citizenship in ways that are variously responsive to postdigital contexts. In line with Adnan et al. (2024), skepticism about digitally-related implications can influence TEDs’ perceived relevance of addressing digital technologies in different subject areas and, consequently, their capabilities of role-modeling teaching, which is crucial for student teachers. According to Loughran (2007), even non-engagement models practice, in this case counterproductively for digital citizenship education in postdigital contexts. As TEDs’ sociotechnical understandings inform PDC development (Tondeur et al., 2019; Uerz et al., 2018), supporting epistemic dimensions of TEDs’ PDC is particularly important (Aagaard et al., 2024; Nagel, 2023), including conceptual understanding of how technology and society interact, and what this means for responsive pedagogies. Papers I–IV align with general scholarly acknowledgment that TEDs’ PDC must extend beyond instrumental approaches (Lund & Aagaard, 2020; Tondeur et al., 2025). As Farjon et al. (2019) and Fischer et al. (2023) observe, instrumental approaches typically treat the digital as separate, a separation that proves particularly inadequate for AI and other societal issues (cf. Sperling et al., 2024). Student teachers often require particular support to move beyond instrumentalism (Almås et al., 2021; Kruskopf et al., 2024). Papers I–IV demonstrate that TEDs’ PDC must include a deep conceptual understanding of digital citizenship education reflecting postdigital contexts of schools and society—understanding that is contingent on institutional arrangements, not solely located within individual TEDs (Carpenter et al., 2024; Fawns, 2022). This empirically grounds and extends arguments by Krumsvik (2014),

Jandrić et al. (2018), and Rapanta et al. (2025) by demonstrating how AI specifically demands such contingent understanding. The urgency intensifies as AI's entanglement with democracy requires holistic understanding of its implications (Bozkurt et al., 2024; Innerarity, 2024) for which TE plays a key role in preparing teachers (Ayanwale et al., 2024; Sperling et al., 2024). How TE professionals, such as TEDs, program coordinators, and others with key responsibilities, approach this role conceptually matters, given local TEI autonomy that risks inconsistent program enactment (Swedish National Agency for Higher Education, 2006; Swedish Higher Education Authority, 2020; cf. Prop. 1992/93:1). However, even when TEDs provide relevant, conceptually-rich learning opportunities, these will not automatically translate into future schoolteacher practices (Wilson et al., 2020). Such integration requires cycles of practical experience and reflection. Here, the theoretical depth of TEDs' enacted learning opportunities for student teachers is essential (Lunenberg & Korthagen, 2009).

### RQ1: Summary

Some theoretical frameworks and TEDs' PDC demonstrate engagement with postdigital contexts. However, substantial gaps remain in how conceptualizations engage specifically with the entangled, evolving character of postdigital contexts. These gaps are particularly evident in TEDs' PDC for their dual-didactic task, translating content into responsive pedagogies.

## Navigating postdigital contexts: roles, responsibilities, and influencing factors

Building on these conceptual insights, RQ2 focused on how TEDs' professional characteristics and institutional arrangements are associated with their approaches to teaching for digital citizenship in postdigital contexts. Addressing this RQ through empirical results across Papers II–IV, this thesis demonstrates that professional characteristics shape these approaches. Particularly, disciplinary background and schoolteacher experience emerge as influential for TEDs' PDC and how they interpret their roles, responsibilities, and capabilities. These individual characteristics operate within broader institutional arrangements that promote or challenge responsive pedagogies. First, I focus on how professional characteristics shape approaches to digital citizenship education in social science TE, then on the institutional arrangements with which these characteristics are entangled. Finally, I examine how such entanglements create systematic variation in TEDs' approaches.

## Professional characteristics shaping digital competence

### ***The role of disciplinary background***

Through the thesis's emergent design, disciplinary background became a key analytical focus. Initial patterns noticed in Paper II's exploratory study led to more explicit attention in Paper III, culminating in Paper IV's national survey that tested these patterns across Swedish TEIs. This methodological progression, from qualitative depth to quantitative corroboration at the national level, is a distinctive contribution of this thesis. Comparable TE research has focused either tacitly on digital citizenship aspects like AI and society (e.g., Nagel, 2023; Velandar et al., 2024) or on particular digital citizenship conceptualizations, primarily in the US (e.g., Lindsey, 2015; von Gillern et al., 2024; cf. Heath, 2018). Such research also exists to some degree in other contexts, such as Norway (e.g., Gudmundsdottir & Hatlevik, 2020; Gudmundsdottir et al., 2020).

Paper IV showed that while TEDs from educational science and TEDs from political science largely agreed on what content social science TE should address (pp. 11–12), there were statistically significant differences, echoed by TEDs' qualitative free-text answers. TEDs from educational science reported higher PDC both for digital citizenship content and the dual-didactic task of addressing such content, including examples of holistic, postdigital understandings of digital citizenship. In contrast, TEDs from political science reported lower PDC across these two areas, with explanations such as digital citizenship content being secondary to their core content areas (cf. Adnan et al., 2024; Vajen et al., 2023). Disciplinary variation thus reflects how multidisciplinary social science TE, in Sweden and other countries, functions as a site of negotiating disciplinary epistemologies and traditions (Barton & Avery, 2016; Davies & Dunnill, 2006; Eklund & Larsson, 2009). Different disciplines bring varying understandings of how humans, technology, and democracy are entangled in postdigital contexts—understandings that, as Fawns (2022) and Markauskaite et al. (2023) argue, higher education institutions themselves embody (cf. Lamb et al., 2022). The patterns align with previous studies on disciplinary backgrounds' influence on TEDs' PDC (Hjukse et al., 2020; Tondeur et al., 2019). Attitudes, beliefs, and disciplinary backgrounds consistently emerge as important factors for PDC across national contexts (Aagaard et al., 2024; Adnan et al., 2024; Tondeur et al., 2019). Such patterns shape how TEDs approach their roles and responsibilities for preparing student teachers for digital citizenship, and their PDC for this dual-didactic task. Echoing Herro et al. (2021), self-efficacy shapes TEDs' PDC for pedagogical approaches.

Papers III and IV demonstrate that teaching to teach for digital citizenship in social science TE is a dynamic entanglement between individuals and institutional arrangements. Strandler (2023) observes a similar pattern in Swedish TE more broadly as does Bussesund et al. (2025) in Norwegian PDC policy enactment (cf. Bombardelli et al., 2021). The implications of this specific entanglement for digital citizenship education cannot be understood by accounting for TEDs' disciplinary backgrounds alone, yet it emerges as a key factor influencing their approaches. This becomes particularly evident when considering TEDs from political science and their current role nationally in teaching subject courses on citizenship, democracy, or digital technologies (66% of the interviewees were from political science in Paper III and 49% of the respondents in Paper IV; cf. Johansson, 2017). Importantly, these patterns reflect how institutional structures channel expertise differently across disciplines. The multidisciplinary character of social science TE, from democratic theory and sociological perspectives to political-economic relations, represents a potential strength when institutional arrangements support cross-disciplinary collaboration rather than fragmentation—an integration Barton (2024) and Mishra et al. (2025) emphasize for addressing contemporary challenges like AI. Institutional arrangements shape TEDs' roles in the courses examined in this thesis, including departmental responsibility distribution and tensions between meaning and purpose of social science TE versus social science education, tensions that vary how they are interpreted and emphasized. These arrangements shape how TEDs approach digital citizenship education (Papers II–III), which are dynamics previously identified in social science education in Sweden (Bronäs, 2003; Larsson & Ledman, 2023) and internationally (Castro & Knowles, 2015). Given the disciplinary representation nationally in subject courses with primary relevance for digital citizenship, the broader implications for student teachers' preparation warrant attention. This concern is particularly acute given how multidisciplinary perspectives must be integrated when addressing social science teaching and learning (Sandahl, 2018). For example, certain perspectives may be privileged since each discipline has its own codified knowledge and paradigms (Castro & Knowles, 2015; Davies & Dunnill, 2006). As Barton (2024) warns, this fragmentation risks “the extent to which they are disconnected from the needs of students, schools, and a troubled world” (p. 9).

### ***Schoolteacher experience as influencing factor for PDC***

TEDs approach their dual-didactic task differently in how they draw on their PDC, regardless of disciplinary background. As Goodwin et al. (2014) demonstrate, competence in teaching does not automatically translate to

competence in dual-didactic teaching. Even for TEDs who express postdigital understandings of digital citizenship, translating such understandings into responsive pedagogies remains a challenge (Papers II–IV). As shown in Paper IV, TEDs’ self-reported PDC dropped significantly from content knowledge (83%) to PDC for their dual-didactic task (61.4%), with even steeper drops for AI aspects (48.9%). Since this pattern appeared across disciplinary backgrounds, it suggests that while disciplines conceptually influence approaches to digital citizenship education, additional professional characteristics influence the translation from understanding to pedagogical practice.

Among these additional characteristics, schoolteacher experience emerges as an important influencing factor for PDC. While Eklund and Larsson (2009) argue that TEDs from educational science may have education-related disciplinary training that supports their dual-didactic task compared to TEDs from other disciplines, Paper IV both corroborated this and showed how schoolteacher experience may be even more important to consider than discipline, in this case for shaping TEDs’ approaches to teaching for digital citizenship. This contrasts with Nelson et al. (2019), who found schoolteacher experience played a limited role in US TEDs’ PDC. This result aligns with Hjukse et al. (2020) on the limited role of TED experience for PDC and with Lunenberg et al. (2007) on its effects for dual-didactic task more broadly. These results warrant further studies as argued in the paper, but they indicate how practical experience may make TEDs better equipped to navigate the in-flux character of citizenship-related social science subject content in TE (Eklund & Larsson, 2009; cf. Campbell et al., 2012). Such experience could therefore help bridge the foundational theory–practice gaps that Bombardelli et al. (2021) identify in social science TE (cf. Darling-Hammond, 2017) and that Richardson et al. (2021) highlight for digital citizenship education specifically.

### ***Professional characteristics shaping responsibility boundaries***

Differences in disciplinary and schoolteacher backgrounds also shape how TEDs approach the boundaries of their responsibilities within social science TE. Papers II–III show that TEDs from different backgrounds make different assumptions about whose responsibility it is to address digital citizenship content, such as their own (particularly among former social science teachers), or colleagues from other disciplines or program areas. Such variation contributes to fragmented approaches where digital citizenship content risks becoming an institutional blind spot. As Røkenes

et al. (2022) emphasize, clear responsibility distribution is essential to ensure TEDs' beliefs align with their dual-didactic task, yet such clarity appears elusive (Papers II–IV). For example, some TEDs teaching subject courses assumed that digital citizenship is addressed in Core Education Subjects and vice versa (cf. Lindfors et al., 2021). Assumed responsibility patterns echo Velander et al.'s (2024) survey of Swedish TEDs, who often located responsibility for digital citizenship with social science TE.

Considering the variation in conceptualizations of digital citizenship and responsibility boundaries synthesized across Papers II–IV, citizenship education in social science TE can be understood as what Star and Griesmer (1989) term a boundary object. Citizenship education is coherent enough to enable TEDs across the TEI, disciplines, and social science TE program areas to come together around citizenship education content, yet flexible enough to be interpreted differently, in this case with attention to the digital dimension. In postdigital contexts, this boundary object quality becomes particularly complex as the very boundaries that such objects typically help coordinate are themselves in flux. These boundaries span multidisciplinary social science TE, responsive citizenship education content, PDC, responsibilities, and institutional program coordination (cf. Biesta & Lawy, 2006; Johannesen et al., 2014). As argued in Paper I drawing on Fawns (2022), Lamb et al. (2022), and Markauskaite et al. (2023), these boundaries are:

*contingent on the shifting entanglements in which pedagogical activities are situated and orchestrated ... [which] extend beyond immediate classroom contexts and pedagogy to include, for example, the broader mesh of relations between human and non-human entities, social practices, teaching goals, university policy, and global issues (p. 4256)*

Tension between coherence and flexibility leads to coordination challenges when different understandings interact without sufficient negotiation: understandings of postdigital contexts for digital citizenship education, TEDs' roles and responsibilities, and approaches to addressing such content in social science TE. Papers II–III both report how TEDs rely on colleagues or coordinators because, according to them, digital citizenship content must be addressed in social science TE and if they themselves do not do it, someone else must. Here, social science TE's multidisciplinary character, while offering rich perspectives, may in fact amplify variation in how TEDs interpret digital citizenship content and their roles, as shown in this thesis. TEDs also represent different academic ranks and experience as TEDs and schoolteachers. As Paper IV

demonstrates, while TED experience shows limited influence on PDC (Hjukse et al., 2020; Nelson et al., 2019), schoolteacher experience emerges as a more important factor at least for digital citizenship education—a distinction requiring more attention in the literature. Consequently, TEDs’ assumptions about responsibility boundaries interact with institutional arrangements in ways that either support coordinated approaches or, more commonly, lead to fragmentation.

As shown above, professional characteristics, such as disciplinary background and teaching experience, create distinctive patterns in TEDs’ approaches to digital citizenship education. In postdigital contexts, supporting TEDs to move from concepts to pedagogies for their dual-didactic task remains a key challenge across professional characteristics. Results from Papers II–IV show that it is one thing to teach how AI reconfigures democratic participation through algorithmic curation and deep-fakes, but quite another to teach student teachers how to teach that content. The gap demonstrates how TEDs need well-rounded PDC across various dimensions as argued by Tondeur et al. (2025). For digital citizenship education specifically, well-rounded PDC includes conceptual understanding that moves beyond mere content delivery. Importantly, TEDs’ PDC for their dual-didactic task needs to be developed deliberately, as it is not there by default. Foundational TE research establishes this principle (Korthagen et al., 2005; Loughran, 2007), with recent scholarship reinforcing it both broadly (Loughran & Menter, 2019) and for PDC specifically (Nelson et al., 2019).

Particularly, PDC must maintain an in-flux character to remain responsive to evolving postdigital contexts for digital citizenship (as explicitly argued in Papers I, III, and IV). The need for responsiveness aligns with calls by Almås et al. (2021) and Johannesen et al. (2014) for plasticity and temporality, extended by Markauskaite et al. (2023) to postdigital contingency. In such postdigital contexts, relationships are continuously renegotiated, co-constitutively, across dimensions such as human–technology, individual–collective, local–global, agency, and how these are entangled with democracy, social justice, and politics (Jandrić & Ford, 2022; Jandrić & Knox, 2022). Otherwise, limited conceptual understandings of postdigital contexts and limited PDC qualities of temporality and plasticity (Papers III–IV) risk undermining TEDs’ translation of postdigital conceptual awareness to responsive pedagogies that student teachers can adapt to their own practices (cf. Lunenberg et al., 2007). Ultimately, this influences how social science education can support young people to deal with the messy postdigital realities of democratic life (Campbell et al., 2012; cf. Örtengren, 2024a).

Professional characteristics thus create systematic variation in how TEDs approach digital citizenship education and the PDC this requires. Yet Papers II–IV demonstrate that these characteristics operate within broader institutional arrangements—an ecological, context-sensitive perspective that aligns with Carpenter et al.’s (2024) international TED survey and Cochran-Smith et al.’s (2015) call to move beyond individual-focused approaches.

## Institutional arrangements: roles and responsibilities

### ***Challenging conditions—fragmented approaches***

As highlighted above, institutional arrangements shape how TEDs approach their roles and responsibilities regarding digital citizenship education, with TEDs exercising agency differently against the backdrop of limited guidance (cf. Dinkelman, 2011). Course documents analyzed in Papers II–III show that social science TE, across program areas and across TEIs, rarely address digital citizenship by explicitly linking, for example, schools’ democratic role, digital technologies, or PDC requirements. This observation reflects a broader pattern of less explicit PDC obligations in Swedish TE curricula and degree objectives (Lisborg et al., 2021). Such ambiguity may explain why TEDs generally acknowledge digital citizenship’s importance but often highlighted policy’s limited practical guidance. For example, some TEDs argued that such support was unclear or inadequate, others how it was adequate but not helpful.

In addition, TEDs report three challenging institutional arrangements. First, heavy teaching loads and limited time with student teachers creates difficulties to cover comprehensive subject content (Papers II–III)—a challenge documented across Swedish higher education (Hauschildt, 2024; Karlsson et al., 2017). These constraints reflect structural funding inequalities, with social science TE operating in two of the lowest-funded higher education areas (Swedish Association of University Teachers and Researchers, 2024; Swedish Higher Education Authority, 2024). Second, professional development is insufficient, which is a challenge broadly for TEDs (Cochran-Smith et al., 2020; Goodwin et al., 2014) and particularly for PDC. This is a recurring issue across national contexts (Andreasen et al., 2022; Lindfors et al., 2021; Voithofer et al., 2019), with 68.1% of TEDs requesting workshops and collegial support in Paper IV’s national survey (see also Papers II–III; cf. Pedersen et al., 2024). These challenges reflect broader institutional tensions in Swedish TE documented by Angervall et al. (2020) and Strandler (2023), including organizational culture and

career structures. Third, uncertainty about responsibility distribution: 51.1% of TEDs reported uncertainty about which department or program area has responsibility for digital citizenship in Paper IV (see also Papers II–III). Particularly regarding the latter, Tondeur et al. (2025) and scholars across contexts emphasize TEIs’ key role for TEDs’ PDC and program-wide integration of related teaching and learning activities for student teachers (Andreasen et al., 2022; Foulger et al., 2017). Yet institutional support proves complex rather than straightforwardly beneficial (Bussesund et al., 2025; Carpenter et al., 2024; Instefjord & Munthe, 2017). For example, TEDs may individually disengage from addressing digital technologies, with collective structures diffusing responsibility and thereby protecting professional identity (Viberg et al., 2023). The combined effect is fragmented approaches, within and across TEIs (cf. Swedish Higher Education Authority, 2020), where TEDs rely on program coordinators, colleagues, and others to ensure digital citizenship content is covered, i.e., they themselves do not address such content, or they address it but in ways that need systematization within the TEI (Papers II–IV). In this sense, social science TE appears to reflect what Löfström and Grammes (2020) observe about democratic fostering in schools: if this indeed is everybody’s responsibility, it becomes nobody’s responsibility.

Regarding this fragmentation in social science TE demonstrated in Papers II–IV, the variation which the Swedish model of deregulated governance allows across TEIs warrants attention. TEIs design social science TE based on national degree objectives, while TEDs enact this program through their teaching. To coordinate the program, some TEIs have a cohesive social science TE unit, and it may exist as an academic subject in which TEDs are hired (Sw. *anställningsämne*). As Tryggvason (2012) observes in Finnish TE, such organizational cohesion can facilitate mutual exchange and professional socialization among TEDs. Elsewhere, a specific discipline (e.g., political science) or function at the faculty level coordinates the program, with shared teaching responsibilities across few or many departments. While national policy matters for enacted PDC in TE, Johannesen and Øgrim (2024) emphasize how local, material TEI structures ultimately shape how PDC is addressed, a pattern echoed in this thesis. Acknowledging the potential importance of these local forms of program coordination, the data included in this thesis provide limited opportunities to explore further how each local form supports or constrains teaching to teach for digital citizenship.

### ***Street-level bureaucracy in enacting social science TE***

TEDs must navigate these institutional arrangements by making professional decisions where professional characteristics demonstrably become important (see next sub-section), leading to systematic differences in how TEDs approach roles and responsibilities. Paper III draws on Lipsky's (2010) street-level bureaucracy concept as an analytical heuristic: TEDs bridge policy and enactment through their professional decisions in encounters with student teachers. As Bussesund et al. (2025) observe, such professional decisions may lead to varying PDC approaches even among TEDs implementing PDC policy based on their roles, identities, and institutional arrangements. Existing Swedish policy and governance structures for TE enable this interpretative space. For example, across the included studies, some TEDs (particularly from educational science) tended to interpret such structures as including digital citizenship, whereas others (often from political science) suggested this was outside their responsibilities and instead referred to institutional coordination that may or may not exist (Papers II–IV).

How TEDs interpret and approach their roles reflect deeper disciplinary differences that extend beyond TEDs' professional decisions to how they frame institutional challenges themselves. Paper IV documents how TEDs from political science backgrounds tended to frame some of the core challenges in policy terms, whereas TEDs from educational science framed them as practical resource needs. This shows how national TE degree objectives can contribute toward a vision for social science TE, but their ambiguity allows TEDs agentic space to “make choices that contribute to what it means to be a teacher educator ‘kind of person . . . in a given kind of context’” (Dinkelman, 2011, p. 314). Hence, either approach is likely to have markedly different implications for the enacted pedagogy of social science TE (Loughran, 2007). Lipsky (2010) terms this “performed policy” (p. xvii): the actual enactment that emerges from street-level professional decisions.

As demonstrated in Papers II–IV, institutional arrangements create barriers rather than support for digital citizenship in social science TE. In other words, the variation in TEDs' approaches does not seem to stem from an unwillingness to engage with digital citizenship or insufficient PDC. These are TEDs with valuable knowledge, skills, and disciplinary perspectives that could enrich student teachers' PDC development, and who believe digital citizenship belongs in social science education, both in TE and schools (cf. Johannesen et al., 2024; Mishra et al., 2025). Rather, as Fawns et al. (2023) argue, the institutional structures themselves, often

designed for pre-digital educational contexts with more stable disciplinary boundaries and content, struggle to remain responsive to postdigital contexts (cf. Barton, 2024). The struggle intensifies when such structures encounter the responsive character of social science subject content (Campbell et al., 2012; Sandahl, 2018). In the absence of stronger cross-disciplinary coordination, the variation in approaches risks exacerbating existing incongruence between social science TE and the school subject (Davies & Dunnill, 2006; Eklund & Larsson, 2009; cf. Christensen, 2011). Such theory–practice gaps are not unique to social science TE. As Lund et al. (2014) observed more than a decade ago, this incongruence is particularly evident in “the digital challenges that newly qualified teachers meet in their profession and the preparations they have received” (p. 282).

## RQ2: Summary

In sum, this analysis identifies distinctive patterns in how TEDs approach digital citizenship education, and the dynamics involved in the entanglement between professional characteristics and institutional arrangements. Disciplinary background and schoolteacher experience emerge as critical factors that influence not only TEDs’ PDC and role interpretations but how they navigate institutional arrangements and conceptualize solutions, such as policy needs or resource allocation. These professional characteristics are entangled with institutional arrangements that either promote or constrain responsive approaches to digital citizenship education. Ultimately, the resulting variation in approaches has crucial implications for student teachers’ preparation to support young people’s digital citizenship in postdigital contexts. These results highlight the need for systematic approaches to developing PDC that engage with the dynamic characteristics specific to multidisciplinary social science TE.

## Developing professional digital competence for digital citizenship in social science teacher education

RQ3 focused on the implications for developing PDC to teach for digital citizenship in social science TE in postdigital contexts. Addressing this RQ by drawing on the results from Papers I–IV, the thesis shows that PDC for digital citizenship education must maintain an in-flux, responsive character rather than representing fixed competencies. This requires both individual TEDs’ capabilities to navigate digital citizenship in evolving

sociotechnical environments and institutional arrangements that support coordinated, adaptive approaches across social science TE program areas.

### Toward reframing professional digital competence

Democracy's meaning and related practices emerge from specific temporal and spatial contexts, shaped by the messiness of past and current sociopolitical trajectories and sociotechnical conditions—a postdigital democracy (Örtengren, 2024a). Yet democracy is dynamic, continuously evolving in ways not yet determined. TEDs' PDC to teach teaching for digital citizenship must be grounded in this understanding (Paper III). Considering this point, the results have several implications for developing PDC to teach for digital citizenship in social science TE, both for TEDs and student teachers.

Given the evolving character of social science citizenship content (Larsson & Ledman, 2023; cf. Campbell et al., 2012), what emerges as a key challenge across Papers I–IV is developing PDC that is, as Starkey (2020) emphasizes, responsive to the contexts in which pedagogical activities are situated, sociotechnical environments included. As argued in Paper III drawing on Almås et al. (2021) and Olofsson et al. (2021), “to be responsive to societal changes, social science education may require, perhaps more than other school subjects, PDC with substantial degrees of *plasticity and temporality*” (p. 540, added emphasis). These are key qualities when addressing how AI reconfigures democratic environments from algorithmic curation of information to generative capacities that challenge established approaches to source criticism and epistemic authority (Paper IV; cf. Coeckelbergh, 2025; Hintz et al., 2019; Innerarity, 2024). Such sociotechnical shifts exemplify why treating PDC as static competencies proves inadequate. PDC must remain responsive to evolving contexts.

To achieve such responsiveness, transformative agency may be a key PDC dimension (Paper I), supporting TEDs to make pedagogically responsive decisions that support student teachers' learning in unpredictable situations (Brevik et al., 2019). This becomes particularly evident in shifting postdigital contexts, echoing what Biesta (2020) characterizes as the uncertainty inherent in citizenship education. Transformative agency, however, requires substantial knowledge, skills, and experience across other PDC dimensions, illustrating what Nagel (2023) describes as their entangled character. Central to this entanglement is, as shown empirically in the thesis, the critical role of TEDs' conceptual understanding of digital citizenship, including how this needs to be deliberately connected to their

dual-didactic task (Papers I–IV). This challenge is evident in RQ2, where TEDs often struggle with translating content into responsive pedagogies, which may stem from various factors. Insufficiently adaptive PDC may be one factor, with TEDs reporting few formal opportunities to develop PDC (Papers II–IV). This indicates that TEDs develop PDC and other profession-specific characteristics in their day-to-day work but need more support, or else they plateau or fall back on previous knowledge bases not necessarily specific to their dual-didactic task (Izadinia, 2014; Lunenberg et al., 2007). As TE research has long established, teaching to teach requires second-order teaching that TEDs themselves have not experienced as learners (Darling-Hammond, 2005; Murray & Male, 2005) and, without relevant preparation, they teach in ways they themselves have been taught as first-order learners (Goodwin et al., 2014; Russell, 2002). These dual-didactic challenges apply equally to teaching for digital citizenship.

Another possible factor for insufficiently adaptive PDC is how TEDs self-identify, which Izadinia (2014) highlights as crucial for TED development. Social science TE is diverse, and those TEDs represent different conceptualizations of program enactment (Barton & Avery, 2016; Davies & Dunnill, 2006; Eklund & Larsson, 2009), tensions which are compounded by the TED profession’s lack of a common knowledge base (Cochran-Smith et al., 2020; Goodwin et al., 2014). This creates challenges to the formation of a common democratic vision of social science TE and a common TED identity (Bombardelli et al., 2021; Dinkelman, 2011; cf. Darling-Hammond, 2005). As one TED stated, a foundational priority for any digital citizenship education initiative in TE should be “that they [TEDs] actually focus on TE” in the first place (Paper II, p. 482), reflecting the responsibility boundaries drawn across professional characteristics. Several interviews (Papers II–III) and survey answers (Paper IV) included TEDs’ explanations of how their characteristics made them expected to have PDC (or not) for digital citizenship education. Examples included age, interests, and schoolteacher experience, but more often disciplinary background.

If TEDs self-identify primarily as representatives of disciplinary knowledge, their approaches to the dual-didactic task become, as Goodwin et al. (2014) observe, one of content rather than pedagogies: telling instead of teaching to teach in ways that let student teachers “see into the thinking like a teacher of experienced others” (Loughran, 2007, p. 5). And it is here that part of the content–pedagogy translation challenges could be, i.e., the bridging of theory and practice in social science TE (Bombardelli et al., 2021; cf. Darling-Hammond, 2017; la

Velle, 2023; Lunenberg et al., 2007), as this translation is anchored not primarily in responsive PDC for TEDs' dual-didactic task, but in disciplinary, more stable knowledge bases, including institutional structures (cf. Barton, 2024; Bombardelli et al., 2021; Fawns et al., 2023; Markauskaite et al., 2023). This echoes how PDC development must focus on developing adaptive, entangled democratic–digital capabilities rather than instrumental mastery of certain digital technologies or pedagogical approaches—a marked contrast to what TEDs across various backgrounds find missing, such as specific apps, physical infrastructure, or teaching time for “yet another thing to cover” (Paper III, p. 538).

These challenges, related to TED identity and translation difficulties, point to the need for a reframing of PDC itself. The results across Papers I–IV signal that instrumental approaches to PDC for digital citizenship education, which treat digital technologies as separate tools to be applied to existing practices, are inadequate for postdigital contexts. Critiquing instrumental approaches, Skantz-Åberg et al. (2022) call for critical approaches to PDC. As shown in the RQ1 section above, digital citizenship conceptualizations that maintain boundaries between “digital skills” and citizenship are ill-equipped to engage with how society and digital technologies are entangled in postdigital contexts, and how social science education is bound up with these entanglements (Fawns et al., 2023; Jandrić & Ford, 2022; Jandrić & Knox, 2022). To engage with such dynamics, TEDs and TEIs must move beyond simply adding the digital to existing student teacher preparation for citizenship education (cf. Farjon et al., 2019; Fischer et al., 2023). As shown in Papers II–III, TEDs believe digital citizenship education needs to be an integrated part. Here, TEDs can contribute with important perspectives across disciplines (cf. Barton, 2024; Mishra et al., 2025), provided that the broader TEI approach to social science TE program enactment is done by teams rather than individual TEDs (European Commission, 2013).

One important step is to recognize that these TEDs' PDC is important, yet depends on entanglements that transcend the immediate pedagogical setting, requiring a broader ecological perspective on PDC (cf. Cochran-Smith et al., 2015). As Markauskaite et al. (2023) argue, “digital technologies and competencies cannot be understood in isolation from a larger mix of tools, practices, goals, people, etc. that constitute teaching” (p. 194). This step means approaching PDC within broader contexts, from classrooms to societal structures. Among these, the basic framing for TEDs' work are the immediate institutional arrangements, with social science TE program-relevant policies, departmental configurations within

the TEI, and stakeholder action across multiple levels shaping conditions for social science TE (Dinkelman, 2011; Goodwin et al., 2014).

### Coordinated multi-level institutional action for practice

As demonstrated in the RQ2 section, TEDs' professional characteristics are important, but so are the institutional structures within which they work. Building on Mirra et al. (2022), the results across Papers I–IV point to the need for multi-level institutional responses for digital citizenship education, specifically supporting TEDs' PDC to teach teaching for digital citizenship. Paper I signaled the importance of deep conceptual understanding underpinning TEDs' PDC, while Papers II–IV showed how practical skills must bridge that understanding for TEDs' dual-didactic task. TEDs' professional role and development therefore emerge as key foci for PDC support.

Development initiatives in PDC must move beyond one-size-fits-all approaches to consider TEDs' varying professional characteristics, from discipline to experience (Papers II–IV), echoing broader acknowledgment in the literature (Adnan et al., 2024; Lindfors et al., 2021; Pedersen et al., 2024). As Uerz et al. (2018) highlight, developing technology-related beliefs and attitudes is critical. For TEDs from political science, for example, professional development might focus on PDC that connects democratic theory to sociotechnical analysis and vice versa for TEDs from educational science, bridging disciplinary strengths with postdigital understandings. Beyond formal professional development, role-modeling by experienced TEDs can support PDC peer-learning within TEIs (Amhag et al., 2019; Gudmundsdottir & Hatlevik, 2018). Again, TEIs must consider whether TEDs work primarily as individuals or as teams (European Commission, 2013). TEIs' strategic vision is essential which, as this thesis shows, must promote coordinating dialogues among TEDs particularly in multidisciplinary social science TE. Acknowledging that institutional support is not enough to understand TEDs' PDC given the role of professional characteristics (Bussesund et al., 2025; Instefjord & Munthe, 2017; cf. Papers II–IV), it is crucial that TEIs anchor a vision of social science TE where PDC for digital citizenship is integrated (cf. Foulger et al., 2017; Tondeur et al., 2025). Anchoring such a vision includes promoting TEDs' self-identification as *social science* TEDs, for example, by organizing and creating incentives for program-related teaching and research that mutually support program and TED development (Dinkelman, 2011; Goodwin et al., 2014; Izadinia, 2014).

Aside from establishing such a vision, the multidisciplinary character of social science TE may also require TEIs to consider the distribution of responsibilities for program areas across disciplines and departments to ensure that PDC for digital citizenship education is not addressed ad-hoc (Paper II–IV; cf. Hjukse et al., 2020). An important question concerns the academic structures within which TEDs and student teachers engage in social science teaching and learning. Particularly, the question concerns how current structures—sometimes appearing as disciplinary siloes or otherwise poorly connected (Papers II–IV)—support program responsiveness to ever-evolving understandings and practices of citizenship in postdigital contexts. Responsiveness may require epistemic changes in PDC as argued above, and reconsideration of social science TE’s organizational structures, particularly program coordinators, directors of studies, and other people with organizational responsibilities. This leads back to organizational structures: do they primarily consider TEDs as working in teams or as individual contributors to program enactment? How do different disciplinary (Papers III–IV) and schoolteacher insights (Paper IV) combine to enrich student teachers’ preparation for digital citizenship education? To promote such combinations, what are the resources for program coordination (Paper II), and are these adequate?

In this thesis, facilitating coordinative efforts emerges not merely a meso-level challenge at the institutional level, however, but also at the macro-level in terms of national policy. Complicating policy coordination is the contested nature of digital citizenship itself (McCosker et al., 2016). As Paper I shows, different conceptual approaches carry substantially different implications for what content to teach and how to support democratic participation. Across Papers II–III, this contestation manifested in TEDs approaching national policy support for digital citizenship education in different ways, particularly national TE degree objectives. Some TEDs appear to see them as separate goals to be translated one by one into student learning outcomes at the course level. Others appear to see these objectives more connectedly. For example, instilling in young people democratic values and developing digital competence are separate objectives, but these require knowledge and skills regarding subject content and teaching and learning, which also are separate degree objectives. This has implications for the design and enactment of social science TE within and across TEIs.

At the national level, then, policy frameworks could to a larger degree clarify how TEDs should consider the relationships between and translation of TE degree objectives, particularly given their role as street-

level bureaucrats where professional decisions matter (Paper III). The interpretative space inherent in existing TE policy and governance creates ambiguity, which TEDs fill differently based on their professional characteristics (cf. la Velle, 2023). The ambiguity risks leading to systematic inconsistencies in whether and how digital citizenship is addressed (cf. Swedish Higher Education Authority, 2020), particularly the imbalance between content delivery and TEDs' approaches to their dual-didactic task. Like with the inconsistencies in TEDs' professional development in digital citizenship education, these institutional questions are too important to be left to chance (Cochran-Smith et al., 2020). Systematic lack of institutional coordination across multiple levels has implications for social science TE program enactment. However, while institutions provide structural conditions, it is ultimately TEDs who plan and enact teaching and learning activities. As Loughran (2007) observes:

*the way teacher education programs are conceptualized, structured and organized does matter; and does influence the ways in which a pedagogy of teacher education might be enacted ... [and yet] no matter how well a teacher education program might be structured, organized or conceptualized (or not), the need for teacher educators to have rich understandings and practices of teaching and learning about teaching is vital (pp. 11–12)*

### RQ3: Summary

Developing PDC for teaching for digital citizenship in postdigital contexts requires an ecological understanding that recognizes in-flux qualities including plasticity, temporality, and transformative agency, which challenges instrumental approaches that treat PDC as static competencies residing solely within individuals. This demands institutional arrangements supporting ongoing professional learning, not just more training or resources. TEIs should consider organizing for team-based approaches where disciplinary diversity enriches preparation. This includes coordination mechanisms, professional development addressing epistemic dimensions of PDC, and structures enabling responsive adaptation to developments like generative AI. Ultimately, this requires reconsidering what social science student teacher preparation for citizenship education means in postdigital contexts.

## Conclusions and implications

The aim of this thesis was to contribute knowledge on how university-based social science TEDs approach teaching to teach for digital citizenship in postdigital contexts. I have explored, analyzed, and discussed how TEDs approach this dual-didactic task within institutional arrangements, with attention to content, professional roles, and teaching capabilities. Ultimately, the thesis discusses implications for the enacted pedagogy of social science TE and its responsivity to the broader societal and educational postdigital contexts in which it is situated. How these TEDs prepare student teachers to foster democratic citizens in responsive ways arguably belongs among the key education challenges facing democratic societies in the 2020s. This urgency stems from accelerating democratic backsliding, AI-scaled erosion of shared epistemic foundations, and blurred boundaries between humans and digital technologies, all having implications for how democracy plays out in postdigital contexts. Against this backdrop, alarming reports in Sweden and beyond observe growing achievement gaps across young people's democratic and digital competence (Fraillon, 2024; Schulz et al., 2024). Notably, while the international ICCS 2022 framework explicitly included digital citizenship, Swedish national reports largely omitted this focus (Arensmeier, 2024; Swedish National Agency for Education, 2023), mirroring the 2022 government's pushback against digital technologies in education. As stated in the Introduction chapter, TEDs' preparation of student teachers to support young people's digital citizenship has possibly not been more important, and the key focus of this thesis has been how TEDs approach this task.

What this thesis has showed is, despite TEDs' general acknowledgment of digital citizenship's importance in social science TE, systematic inconsistencies in how they approach such citizenship education regarding content, professional roles, responsibilities, and capabilities—PDC—for such teaching. As shown, postdigital contexts challenge both conceptualizations of citizenship education and what it means for TEDs to prepare student teachers for citizenship education. The considerable autonomy of Swedish TEIs to design and enact TE programs also creates an interpretative space for TEDs as street-level bureaucrats between written and performed policy (Lipsky, 2010), where systematic inconsistencies show in TEDs' professional characteristics, particularly disciplinary and schoolteacher background. While agreeing on source criticism's importance, different TEDs, depending on professional characteristics, conceptualize digital citizenship content differently, from ethics to AI's role for democracy, and the degree to which digital

technologies are embedded in or separate from how citizens live out their lives in postdigital contexts. Of course, there may be characteristics other than disciplinary background and schoolteacher at play which the studies have not considered, but TED experience does not appear to be one of them.

Variation in conceptualizations extends to TEDs' approaches to their professional roles and responsibilities. Some reportedly have PDC to teach teaching for digital citizenship, but many TEDs view the shift from teaching content to teaching *to teach* that content as challenging. A background in educational science with schoolteacher experience emerges as an important predictor of TEDs' PDC for their dual-didactic task in this regard, and yet in the courses on citizenship, democracy, or digital technologies in Swedish social science TE, about half or more of the TEDs come from political science whose background negatively predicts such PDC.

While TEDs' individual approaches to digital citizenship education are important, they approach it within multi-level institutional arrangements. Institutional arrangements that have implications for TEDs' approaches are situated both at the departmental level (e.g., teaching load, program responsibility distribution and coordination, professional development opportunities) and the national level (e.g., TE degree objectives, steering documents that TEDs need to consider such as national school curricula). Given these multi-level dynamics, TEDs' varying approaches to digital citizenship education and related PDC are not necessarily issues as much as strengths, provided that TEIs organize for TEDs to work in teams where their diverse disciplinary expertise and experience can enrich student teachers' preparation. Team-based approaches require coordination at the institutional level, integrating a vision of social science TE, including digital citizenship education's role, with relevant PDC and structures conducive to TEDs' coming together as team members of the TED profession.

## Empirical, methodological, and theoretical contributions

This thesis makes several interconnected contributions to TE research on TEDs' work, roles, responsibilities, and influencing factors (Menter, 2023), particularly how these unfold in postdigital contexts where digital and democratic dimensions are entangled. *Empirically*, it provides the first comprehensive study of digital citizenship in Swedish social science TE, and among the first systematic investigations of digital citizenship in Swedish education broadly. It demonstrates systematic patterns in how

TEDs' professional characteristics, especially disciplinary background and schoolteacher experience, are associated with their approaches to teaching for digital citizenship and related PDC within institutional arrangements. Comparable research has either focused tacitly on digital citizenship aspects or examined particular conceptualizations primarily in the US and, to some degree, other national contexts such as Norway. *Methodologically*, the emergent design enabled moving from small-scale qualitative depth in Papers II–III to national-level understanding in Paper IV, with the mixed method survey corroborating and nuancing the qualitative patterns at scale across Swedish TEIs. The progression from exploratory insights to systematic national patterns represents a distinctive approach to studying digital citizenship education in TE, contrasting with single-study designs common in research on TEDs and digital technologies. *Theoretically*, the thesis advances understanding of PDC for digital citizenship education through a postdigital lens. By analyzing conceptualizations of digital citizenship, in the literature and among TEDs, it challenges instrumental framings of digital technologies in favor of ecological understandings that recognize how human–technology relations are entangled with democratic participation. The thesis conceptualizes PDC as requiring in-flux qualities, including plasticity, temporality, and transformative agency, to remain responsive to evolving postdigital contexts. The empirical, methodological, and theoretical contributions speak to international TE challenges, as systems worldwide grapple with preparing teachers for digital citizenship education amid democratic pressures and rapid sociotechnical change.

Challenges such as multidisciplinary coordination, dual-didactic role-modeling, resource constraints, and unclear responsibility distribution are not new to TE (Bombardelli et al., 2021; Korthagen et al., 2005). What this thesis shows is how these structural tensions manifest when TEDs address citizenship education in postdigital contexts. As reflected in Swedish history, relationships between education and technologies shift in policy and discourse (Rensfeldt & Player-Koro, 2020), where many discussions in the 2020s revolve around generative AI (Giannakos et al., 2024). Yet the fundamental challenge persists: ensuring coherent student teacher preparation for citizenship education in ways that are responsive to evolving societal contexts, which in Sweden and countries with similar governance structures means within decentralized education systems.

Policy shifts in Sweden and beyond threaten to weaken preparation for digital citizenship which demonstrably TEDs already find challenging within existing institutional arrangements. Understanding these dynamics is therefore urgent because, as Menter (2023) observes, TE is:

*a key site for determining what it is that societies value in their visions of the future ... the ways in which teachers are prepared for and supported in their work can reveal a great deal concerning the aspirations for citizens of the future, as well as the present (p. 26)*

A key question then is what the aspirations are for young citizens, future and present, and how social science TE organizes for student teacher preparation accordingly. While these contributions emerge from social science TE, their relevance extends across Swedish TE contexts. The institutional dynamics documented here, such as decentralized governance creating interpretative space, responsibility distribution challenges, multi-level coordination needs, and street-level bureaucratic enactment, operate across all Swedish TE programs. Similarly, results regarding dual-didactic challenges, professional development needs, and in-flux PDC qualities apply to TEDs regardless of subject specialization given the digital infusion of education and society. However, social science TE has two distinctive features: disciplinary diversity within a single program and digital citizenship education's curricular centrality. These distinctions may diminish as policy reforms reduce emphasis on democracy and digital competence across TE and schools.

## Implications for policy

The variation documented in this thesis reflects inherent tension in Swedish TE governance. While decentralization enables local adaptation and professional autonomy, which are values well established in Swedish education governance and its grounding in European continental *Didaktik*, it also creates fragmentation and inconsistency as this thesis has demonstrated. Scholars have therefore called for increased policy support for TEDs' PDC to address digital citizenship and other societal issues (e.g., Gudmundsdottir et al., 2020; Willermark et al., 2023). However, increased centralization could risk exacerbating rather than resolving challenges of variation. As Jarl and Rönnerberg (2019) observe, Swedish education policy operates through multilevel governance, where policy emerges through negotiations across organizational levels. Multi-level governance means that more detailed national steering documents could intensify TEDs' street-level bureaucratic work, creating additional interpretative space and potentially increasing rather than decreasing variation (Lipsky, 2010). Moreover, tighter control could constrain the responsive, context-sensitive pedagogies that citizenship education requires in postdigital contexts, limiting TEDs' professional judgment about adapting to generative AI and other rapid sociotechnical developments (Paper III, p. 527; cf. Edling & Mooney Simmie, 2020).

Moving beyond a centralization–decentralization binary, the results suggest reinforcing *coordinated decentralization*. Such decentralization maintains local autonomy while providing clearer policy frameworks—not more—while supporting institutional coordination. Coordinated decentralization includes explicit articulation of how TE degree objectives relate to each other, particularly how democracy and digital competence intersect, and acknowledgment that TEIs need resources and flexibility to coordinate preparation across programs and disciplines and support TEDs in enacting coherent social science TE.

The initiatives to remove democracy from TE degree objectives and digital competence from school curricula (SOU 2024:81; SOU 2025:19) contradict this thesis’s results by exemplifying risks of weakening preparation for digital citizenship. Such policy shifts reflect ongoing struggles over who has power to define public education’s purposes (Rensfeldt & Rahm, 2023), with implications for how TEDs approach their responsibilities. The government’s exclusion of education from Sweden’s next strategy on AI exemplifies these dynamics. As shown here, TEDs already report ambiguous guidance for digital citizenship education. Removing these anchors would likely intensify the documented fragmentation, as individual differences and institutional arrangements shape how TEDs interpret responsibilities.

The consequences extend beyond TE to social science classrooms. When preparation for digital citizenship becomes contingent on institutional happenstance—coordinator priorities, TED backgrounds, departmental organization—education systems risk perpetuating rather than disrupting inequality. Young people whose future teachers received robust preparation have opportunities to develop capabilities for critical engagement with digitally-reconfigured democratic environments. Those whose teachers encountered digital citizenship only peripherally lack such opportunities. Young people already navigating multiple educational disadvantages face disproportionate impact when their social science teachers lack preparation for how digital technologies are entangled with democracy (cf. Fraillon, 2024; Schulz et al., 2024; von Davier et al., 2024). Sweden’s decentralized TE structure, with varyingly functional coordinating mechanisms, thus risks reducing the democratic cornerstone of education to institutional variables.

Moreover, many TEDs find teaching how to foster democratic citizens challenging (cf. Goodwin et al., 2014). Removing democracy from degree objectives risks making this challenge invisible in TE policy while it remains a cornerstone in national school curricula, albeit with diminished

emphasis on digital competence. Removal sends a policy signal that the relationship between digital technologies and democratic participation is not a priority, or an ambiguous one at best. Such ambiguity contradicts both documented student needs and public expectations across Europe that schoolteachers can address AI in teaching and learning (European Commission, 2025b), as well as the urgent need for TEDs' PDC to evolve with how AI and other digital technologies reconfigure democratic participation and epistemic foundations (Aagaard et al., 2024; Almås et al., 2021). The contradiction reflects what Rensfeldt and Player-Koro (2020) identify as recurring dynamics in Swedish education, where political agendas draw on sociotechnical imaginaries to leverage political reform (cf. Lindblad & Lundahl, 2026).

Regardless of how reform initiatives proceed, TEDs' professional decisions as street-level bureaucrats mean policy intent does not automatically translate to enacted practice (Menter, 2023, p. 5), creating concern but also possibility. As this thesis demonstrates, TEDs already navigate policy ambiguity in varied ways, with some addressing digital citizenship education despite limited guidance, with an eye to ensuring social science TE's responsiveness to its societal context. Their choices reflect understanding that citizenship education in postdigital contexts cannot be purposefully addressed if social science TE ignores how AI reshapes political discourse and epistemic authority. Thus, professional autonomy, however uncoordinated as documented here, reflects that pedagogical commitment, democratic preparation, and social science TE's responsivity to postdigital contexts continue. The reflection carries resonance across postdigital contexts even amid 2020s policy shifts of so-called "brain-based education" and unhelpful separation of analog versus digital education (Forsler & Guyard, 2023; Kotouza et al., 2025).

### Implications for practice

At the TEI level, the results highlight critical needs for institutional coordination regardless of policy developments. The multidisciplinary character of social science TE offers rich disciplinary perspectives for addressing democracy in evolving postdigital contexts. This requires structures for TEDs to work in teams where their diverse expertise can enrich rather than fragment student teachers' preparation. This includes establishing clear program-level visions for how digital citizenship is addressed across subject courses and Core Education Subjects, with explicit attention to progression, integration, and shared responsibility.

Professional development opportunities targeting TEDs' PDC for digital citizenship education emerge as key, with the expressed preference for workshops and collegial support. These must move beyond instrumental "tool training" to address the epistemic dimensions of PDC (Aagaard et al., 2024; Lund & Aagaard, 2020), supporting TEDs' conceptual understanding of how technology and society are entangled and what this means for responsive pedagogies. Importantly, professional development should account for TEDs' varying professional characteristics (Pedersen et al., 2024). As shown, differentiated approaches must bridge disciplinary strengths, schoolteacher experience, and postdigital understandings with institutional arrangements across traditional organizational structures in higher education (Markauskaite et al., 2023).

TEIs also need to reconsider responsibility distribution across departments and program areas. The assumption that someone else addresses digital citizenship, whether colleagues in other disciplines or other program areas, contributes to fragmentation. Clarity on shared responsibility with coordination mechanisms across disciplinary and program boundaries can prevent digital citizenship education from becoming no one's responsibility (cf. Löfström & Grammes, 2020).

With the government's December 2025 decision to implement the 2028 TE Reform (Government Offices, 2025c) and proposed school curriculum reforms under consideration (SOU 2025:19), TEIs and TEDs will need to rethink how they work to ensure democratic responsiveness of social science TE (cf. Dengerink et al., 2015). For TEIs, local coordination becomes even more critical. With fewer national policy anchors, TEIs must strengthen cross-program structures to ensure student teachers engage with TEDs who role-model digital citizenship education through coherent, gradual progression (Foulger et al., 2017; Tondeur et al., 2025). This may include developing shared course materials, coordinating cross-disciplinary lectures or workshops, and professional knowledge sharing within and across TEIs. Such sharing can support effective dual-didactic approaches through, for example, networks, conferences, or collaborative research combined with self-study (Loughran, 2010; Pedersen et al., 2024). TEDs can leverage their street-level bureaucratic agency to interpret new and remaining policy frameworks in ways that preserve space for addressing democracy and digital technologies. For example, degree objectives related to subject content knowledge and pedagogical capability can be understood as necessarily including digital citizenship in postdigital contexts, even without explicit democracy objectives. Similarly, objectives around supporting all students' learning and development can be framed as requiring attention to digital competence for democratic participation.

## Future research

Just as the overarching emergent design of this thesis has facilitated the generation of new theoretical and empirical insights into digital citizenship education and TEDs' related PDC in social science TE contexts, it has opened avenues for future research. Postdigital contexts evolve rapidly, and these results reflect the conditions of the early to mid-2020s. The prominence of AI in research, policy, and public discourse during this period is reflected in the data, highlighting the need for studies that track how this field develops as contexts shift, such as longitudinal studies. Moreover, program-wide research beyond courses addressing citizenship, democracy, or digital technologies could contribute to a fuller understanding of social science TE coordination, including whether and how TEDs come together as social science TEDs. This includes further exploration of institutional dynamics, such as responsibility distribution, coordination processes, and how academic hierarchies shape TEDs' experiences of contributing to program delivery (cf. Angervall et al., 2020; Strandler, 2023).

There is also a need for methodologically diverse research into multi-level program coordination, within and across TEIs, exploring how different coordination approaches contribute to or constrain digital citizenship education in social science TE. As Mirra et al. (2022) observe, "Systemic problems require systemwide responses ... if we want to provide quality digital citizenship education at scale, then we will need to take action on many levels at once" (p. 35). Such research could include, for example, program coordinators, international comparative studies, and TE classroom observations exploring how student teachers experience documented variation in approaches to digital citizenship education. Classroom-based research would be particularly valuable for examining the didactic dimensions of teaching for digital citizenship in postdigital contexts—how TEDs enact subject-specific pedagogies, what teaching–learning processes emerge when addressing AI's implications for democracy, and whether this requires rethinking didactic approaches. Observations are particularly important given this thesis's reliance on self-reported data, exploring TEDs' reported approaches *vis-à-vis* enacted pedagogies. This includes good examples of practice (Kelchtermans, 2015), which could inform institutional coordination and the ongoing development of PDC frameworks responsive to digital citizenship in postdigital contexts. Such efforts could ultimately shape young people's future opportunities in schools to develop capabilities to act and participate as democratic members of postdigital societies.

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# Appendices

## ***Appendix I: Paper II, Information letter (Translation)***

Interview invitation  
Alex Örtegren, PhD student  
alex.ortegren@umu.se  
090-786 74 72



March 16, 2021  
Page 1 (1)

UMEÅ UNIVERSITY

### **Interview about teacher education and digital technologies**

As a PhD student in Educational work at the Department of Applied Educational Science, I am conducting an interview study that focuses on teacher education, digital technologies, and citizenship. The purpose is to investigate teacher educators' perspectives on the role of teacher education in relation to schools' democratic mission in a society where digital technologies are omnipresent in people's everyday lives. The research principal is Umeå University.

The reason I am contacting you is that a coordinator or colleague at your institution specifically recommended you among those who have taught on the teacher program related to the democracy module in Core Education Subjects I at some point during the past three years. Based on this recommendation, I wonder if you would like to participate in the study, preferably if possible sometime during late February or in March. The results will be presented in a journal article and possibly at academic conferences.

If you choose to participate, it involves one interview session (estimated time required approximately 60 minutes). The plan is to conduct the interview via Zoom. No special preparations are required. After our conversation, which I would like to record with your permission, I will transcribe the interview. I will then send this text to you to ensure that I have understood your responses correctly.

Your participation will be coded (a pseudonymized name will be used in quotes and descriptions) in such a way that no connection can be made between the interview and you. Your participation is voluntary and you can withdraw at any time without providing a reason. You can do so by notifying me via email.

The material will be stored digitally on a locked-in hard drive to minimize the risk of unauthorized access. When the research project is completed, the material will be archived for ten years before being destroyed.

I would be grateful if you could let me know your decision as soon as possible, either via email or by phone, but **at the latest by March 30**. If you have any questions, you are of course welcome to contact me.

Hoping for your participation,

Alex Örtegren  
PhD student  
alex.ortegren@umu.se  
090-7867472

Professor Anders D. Olofsson  
Dissertation project supervisor  
anders.d.olofsson@umu.se  
090-7867809

Department of Applied Educational Science

## ***Appendix II: Paper II, Consent form (Translation)***

Consent form



March 16, 2021  
Page 1 (1)

UMEÅ UNIVERSITY

### **Consent to participate in interview study about teacher education, citizenship and digital technologies**

I have read and understood the information about the study described in the interview invitation (March 2021). I have had the opportunity to ask questions and I have received answers to them. I may keep the written information.

- I consent to participate in the study described in the interview invitation (March 2021).
- I consent to my personal data being processed in the manner described in the interview invitation (March 2021).

Place and date

Signature and printed name

.....

.....

### ***Appendix III: Paper II, Interview guide (Translation)***

The interviews analyzed and reported in Paper II focused on TEDs teaching courses addressing citizenship, democracy, or digital technologies within Core Education Subjects. All interviews were conducted in Swedish using the interview guide below, which has been translated into English for this appendix.

In addition to questions specific to the study's purpose, the interviews included background questions covering areas such as work experience prior to becoming a TED, experience as a TED, current role in teacher education, and involvement in the courses included in the study.

- If you think about society in general, what is your view of digitalization? Where are we now and where are we heading? What opportunities and challenges do you see?
- How would you describe your competence regarding:
  - the use of digital technologies in your everyday life and in your work as a teacher educator?
  - digital technologies in relation to young people's political and civic engagement? Issues such as disinformation and post-truth?
  - digital surveillance, algorithms, Big Data, and artificial intelligence?
- If you think about democracy today, what role do digital technologies play?
- What role does teacher education have in developing student teachers' democratic competence?
- What is your experience of student teachers' engagement in the democracy and education module within Core Education Subjects? Do discussions address digital technologies?
- What do you do, if anything, to promote student teachers' democratic competence when you teach? Do you address digital technologies?

- Fostering future citizens is part of schoolteachers' work. What could *digital* citizenship entail? What might this mean for schools' democratic role? What digital competence would teachers and student teachers need to develop to be able to teach about digital citizenship as you describe it? What are the reasons why this is important (or not)?
- How do you see the role of teacher education in offering student teachers this type of content? What digital competence would teacher educators need to be able to teach about this? In what ways is this currently addressed (or not) in teacher education? Beyond digital competence, what else might be needed to offer student teachers this content?
- How do you view the boundaries between face-to-face and online, offline and online, virtual and real, natural and artificial, human and technology? Do you think these boundaries have changed? If so, how?
- How do you view the relationships between technology, humans, and social change?
- What thoughts has this conversation sparked for you, if any?
- Is there anything you would like to add before we conclude the interview?

## ***Appendix IV: Paper II, Email inviting transcription comments (Translation)***

### **Subject: Transcription for approval**

Dear \_\_\_\_\_,

Thank you for our recent meeting and for an engaging conversation.

I would like to inform you that I have now transcribed the interview. For data security purposes, I have shared the document with you via OneDrive so that nothing is stored in email inboxes. You should have received a separate email. If not, you can find the document at the following address: [https://umeauniversity-my.sharepoint.com/\[link\]](https://umeauniversity-my.sharepoint.com/[link]).

You have editing rights so you can edit directly in the document so that nothing is stored in email inboxes. You can enter suggestions for changes directly in the document, but please highlight these in color in such cases and let me know. I may mention that I have deliberately retained certain colloquial features in the transcription to capture the conversational dynamics, such as shifts and additions.

Please feel free to provide feedback on the document when you have had time and opportunity to review it. The material will not be used until I have received your confirmation. Thanks again for your time!



UMEÅ UNIVERSITY

Alex Örtegren

Doctoral student / Doktorand

Department of Applied Educational Science / Institutionen för tillämpad utbildningsvetenskap

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## ***Appendix V: Paper II, Follow-up email to participants (Translation)***

**Subject: Follow-up regarding study on teacher education and digital technologies**

Dear \_\_\_\_\_,

I would like to thank you for our conversation, which contributed to the publication of my first article. An early version of the study's results section was presented at the Scuola Democratica conference *Reinventing Education* in Rome on June 2–5, 2021. After the summer, I presented the study at the University of Iceland and then at the University of Oslo. Last week, the article was finally published as open access in *Postdigital Science and Education*: <https://doi.org/10.1007/s42438-022-00291-7>.

Should you have any questions or concerns regarding the study, please do not hesitate to contact me. Once again, many thanks for your help!

Best regards,  
Alex



UMEÅ UNIVERSITY

Alex Örtengren  
Doctoral student / Doktorand  
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## ***Appendix VI: Paper III, Information letter (Translation)***

Interview invitation  
Alex Örtegren, PhD student  
alex.ortegren@umu.se  
090-786 74 72



April 1, 2022  
Page 1 (1)

UMEÅ UNIVERSITY

### **Interview about educating aspiring social science teachers and digital technologies**

As a PhD student in Educational work at the Department of Applied Educational Science, I am conducting an interview study that focuses on the education of aspiring social science teachers, digital technologies and citizenship. The purpose is to examine teacher educators' perspectives on social science teacher education's role in relation to schools' democratic mission in a society where digital technologies are omnipresent in people's everyday lives. The research principal is Umeå University.

The reason I am contacting you is that I have received information that you teach (or have taught) one or more courses whose content is relevant regarding social science teaching and questions related to democracy and citizenship. Therefore, I wonder if you would like to participate in the study, preferably if possible sometime in April or May. The results will be presented in a journal article and possibly at academic conferences.

If you choose to participate, it involves one interview session (estimated time required approximately 45 minutes). The plan is to conduct the interview via Zoom. No special preparations are required. After our conversation, which I would like to record with your permission, I will transcribe the interview. I will then send this text to you to ensure that I have understood your responses correctly.

Your participation will be coded (a pseudonymized name will be used in quotes and descriptions) in such a way that no connection can be made between the interview and you. Your participation is voluntary and you can withdraw at any time without providing a reason. You can do so by notifying me via email.

The material will be stored digitally on a locked-in hard drive to minimize the risk of unauthorized access. When the research project is completed, the material will be archived for ten years before being destroyed.

I would be grateful if you could let me know your decision as soon as possible, either via email or by phone, **at the latest by April 12**. If you have any questions, you are of course welcome to contact me.

Hoping for your participation,

Alex Örtegren  
PhD student  
alex.ortegren@umu.se  
090-7867472

Professor Anders D. Olofsson  
Dissertation project supervisor  
anders.d.olofsson@umu.se  
090-7867809

Department of Applied Educational Science

# Appendix VII: Paper III, Consent form (Translation)

Consent form



April 1, 2022  
Page 1 (1)

UMEÅ UNIVERSITY

## Consent to participate in interview study about educating social science teachers and digital technologies

I have read and understood the information about the study described in the interview invitation. I have had the opportunity to ask questions and I have received answers to them. I may keep the written information.

- I consent to participate in the study described in the interview invitation (March 2021).
- I consent to my personal data being processed in the manner described in the interview invitation.

Place and date

Signature and printed name

.....

.....

## ***Appendix VIII: Paper III, Interview guide (Translation)***

The interviews analyzed and reported in Paper III focused on TEDs teaching social science subject courses addressing citizenship, democracy, or digital technologies. All interviews were conducted in Swedish using the interview guide below, which has been translated into English for this appendix.

In addition to questions specific to the study's purpose, the interviews included background questions covering areas such as work experience prior to becoming a TED, experience as TED, and the participant's current role within social science TE broadly and in the courses included in this study.

- If you think about democracy today, what role do digital technologies play for democracy?
- Fostering and educating citizens is part of social science teachers' work in schools. What role does digitalization have for this work?
- What components could *digital* citizenship include?

[Author presents examples of components using graphic elicitation; APPENDIX IX]

- If you take a moment and look at these examples, is there anything here that you think could be included in digital citizenship? How do these examples mirror your idea of what digital citizenship could include? Is there anything that you feel is missing?
- What role does teacher education have when it comes to providing aspiring social science teachers with knowledge regarding this?
- Is this anything that you or your colleagues address today when you teach social science student teachers? If so, how?
- What do you think about the degree to which these questions are addressed? What would be necessary for these questions to be addressed to a greater degree, if anything?
- What is your impression of teacher educators' digital competence regarding teaching social science student teachers about this content?

- How would you describe the professional development that you have been offered at your teacher education institution regarding digital competence and the questions that we have discussed during this interview?
- To teach about this, is there anything else necessary aside from digital competence?
- Do you know if there are any degree objectives related to digitalization that are addressed in the area of social science teacher education where you teach? If yes, how do you address these degree objectives?
- At your teacher education institution, have you paid attention to, for example, the changes in national curricula in 2018? To government surveys that have focused on digital competence and related questions linked to democracy?
- What thoughts has this conversation sparked for you, if any?
- Is there anything you would like to add before we conclude the interview?

## ***Appendix IX: Paper III, Graphic elicitation (Original)***

Access, tillgång	Delta i demokratin	Filterbubbla, post-truth	Lagar, regler	Sociala medier
Algoritmer	Delta i samhället	Identitet	Maktkritik, utmana	Sund användning
Artificiell intelligens (AI)	Digital kompetens	Kränkningar	Medie- och informations kunnighet	Säker, trygg användning
Data, information	Etik, normer	Källkritik	On-/offline	Utanförskap

*Translation (by column):*

*Access; Algorithms; Artificial intelligence (AI); Data, information*

*Democratic participation; Societal participation; Digital competence; Ethics, norms*

*Filter bubble, post-truth; Identity; Offending (someone); Source criticism*

*Laws, rules; Critique of power, challenging; Media and information literacy; On-/offline*

*Social media; Sound use; Safe, responsible use; (Social) Exclusion*

## ***Appendix X: Paper III, Email inviting transcription comments (Translation)***

### **Subject: Transcription for approval**

Dear \_\_\_\_\_,

Thank you for our recent meeting and for an engaging conversation!

I have now transcribed the interview. For data security purposes, I have shared the document with you via Microsoft OneDrive (encrypted) so that nothing is stored in any email inbox. (You may have received a separate email from OneDrive.) You can find the document at the following address: [https://umeauniversity-my.sharepoint.com/\[link\]](https://umeauniversity-my.sharepoint.com/[link])

You have editing rights, which means that you can add comments to suggest changes directly in the document (nothing is stored in any email inbox). Please let me know if there is anything you would like us to change. I have deliberately retained certain colloquial features in the transcription, including pauses, to capture the conversational dynamics, such as shifts and additions. Please feel free to provide feedback on the document when you have had time and opportunity to review it. The material will not be used until I have received your confirmation.

Thanks again for your time, and please feel free to contact me if you have any questions or concerns!

Best regards,  
Alex



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## **Appendix XI: Paper III, Follow-up email to participants (Translation)**

### **Subject: Article published**

Dear \_\_\_\_\_,

First, I wish to thank you again for our conversation during the spring of 2022, which last week contributed to my being able to publish the third article included in my compilation thesis. I have been a participant myself in research projects and found it interesting to hear what happened afterward. Therefore, I wish to follow up with you now that the study has been published in *Teachers and Teaching* (together with my main supervisor Anders D. Olofsson): <https://doi.org/10.1080/13540602.2024.2342860> (PDF attached to this email).

The fact that I have been on leave and that the special issue in which this article was published was delayed have together pushed back publication. Despite this delay, an initial analysis of the study's results was already presented at the *ECER* conference in September 2022 (<https://eera-ecer.de/previous-ecers/ecer-2022-yerevan>). The study has also been presented at various research seminars, for example during a research visit at the University of Oslo in October 2022. Since the publication, the study has also received attention on Umeå University's website in a popular-science format (<https://www.umu.se/pedagogiska-institutionen/fem-snabba/2024-ortegren-olofsson/>).

Should you have any questions or concerns regarding the study, please do not hesitate to contact me. Once again, many thanks for your help!

Best regards,  
Alex



UMEÅ UNIVERSITY

Alex Örtegren  
Doctoral student / Doktorand  
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## **Appendix XII: Paper IV, Information letter (Translation)**

Survey invitation  
Alex Örtegren, PhD student  
alex.ortegren@umu.se  
090-786 74 72



March 3, 2025  
Page 1 (1)

UMEÅ UNIVERSITY

### **Survey study: Social science teacher education, democratic participation, and digital technologies**

As a PhD student in Educational work at the Department of Applied Educational Science, Umeå University, I am conducting the final sub-study for inclusion in my compilation thesis. The study examines the preparation of social science teachers in relation to democratic participation and digital technologies.<sup>2</sup>

The purpose is to develop a better understanding of digital competence within social science teacher education, related to schools' knowledge and democratic missions in a changing society, for example regarding phenomena such as fake news and new forms of democratic participation. The study encompasses all 16 teacher education institutions that prepare (or have recently prepared) aspiring social science teachers.

You have been recommended for this study by those at your institution who are responsible for the social science subject, the social science teacher education program, or study directors within this program. They have made this recommendation thinking that you likely teach (or have taught in the past three years) about issues related to democracy, schools' democratic mission, citizenship, or digital technologies.

The web survey takes approximately 15–25 minutes to complete, depending on your responses. The link is provided in the invitation email. No preparations are required. The results will be presented at an aggregated level in a scientific article and at conferences.

The study adheres to the guidelines in the Swedish Research Council's *Good Research Practice* (2024). The survey is anonymous and no personal data is processed. Participation is voluntary and can be discontinued at any time without providing reasons or consequences. To be able to withdraw your participation later, save a copy of your responses (possible on the survey's last page) and email this together with your request.

The study is funded by the Swedish Research Council (project number 2019-03607).

Hoping for your participation,

PhD student Alex Örtegren  
Umeå University  
Department of Applied Educational Science  
alex.ortegren@umu.se  
090-7867472

Dissertation project supervisor  
Professor Anders D. Olofsson  
Umeå University  
Department of Education  
anders.d.olofsson@umu.se  
090-7867809

The research principal is Umeå University. Contact details: Umeå University, 901 87 Umeå, [registrator@umu.se](mailto:registrator@umu.se), 090-786 50 00.

## ***Appendix XIII: Paper IV, Web survey (Translation)***

--- LANDING PAGE OF SURVEY ---

### **Survey study: Social science teacher education, democratic participation, and digital technologies**

#### **Purpose**

The purpose of this survey study is to explore social science teacher educators' views on teaching about issues related to democratic participation and digital technology in social science teacher education.

You have been recommended for this study by those responsible at your institution for the social science subject, the social science teacher program, or study directors within the program. Your help is important for understanding how social science teacher educators nationally view these types of issues.

#### **About the survey**

The survey takes approximately 15–25 minutes depending on how you respond and contains questions about:

- the role of social science teacher education regarding teaching about issues that can be connected to democratic participation and digital technology
- individual and organizational conditions for such teaching
- some background questions (e.g., employment subject, teaching experience).

The survey can be completed on both computer and cellphone, but the survey pages are best displayed on a computer screen.

#### **Ethics and data management**

- The study follows the 2024 Swedish Research Council guidelines (<https://www.vr.se/analys/rapporter/vara-rapporter/2024-10-02-god-forskningssed-2024.html>) for good research practice.
- The survey is anonymous – no personal data is processed.
- Participation is voluntary and can be discontinued at any time.
- To later be able to withdraw your participation, save a copy of your responses (the survey's last page) which you email together with your request.
- Results will be presented at an aggregated level in a scientific article and at conferences. No participants or institutions will be identifiable.
- For more information, see the invitation letter.

The study is funded by the Swedish Research Council (project number 2019-03607).

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- I have read the above and wish to continue
- Cancel

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**Background**

We begin with some background questions.

## 1. Current position

- Adjunct lecturer
- Doctoral student
- Senior lecturer
- Associate professor
- Professor
- Other, please specify: \_\_\_\_

## 2. Current employment subject

- Didactics
- Education
- Educational work
- Social science education
- Sociology
- Political science
- Other, please specify: \_\_\_\_

3. Primary disciplinary background

- Didactics
- Education
- Educational work
- Sociology
- Political science
- Other, please specify: \_\_\_\_

4. Teaching experience in teacher education (estimated number of years): \_\_\_\_

*Example: I have taught prospective teachers, to some degree and regardless of which subject they will later teach, since 2022, so approximately 3 years.*

5. Have you previously taught in compulsory or upper secondary school?

- Yes
- No

*This refers to teaching in school that you were responsible for planning and enacting. For example, a short substitute period can be counted while individual substitute occasions, planned by another teacher, do not count.*

6. Do different departments, disciplines or faculties (or similar) have responsibility for different parts of the social science subject at your teacher education institution?

- Yes
- No

*Example: At my teacher education institution, the Department of Political Science and the Department of Education are responsible for different courses within the social science subject. In other words, different departments are responsible for different parts of the social science subject.*

7. How is subject didactics for prospective social science teachers primarily taught at your teacher education institution?

- Separately (e.g., separate courses, semesters, or parts of semesters)
- Integrated into subject content studies
- Separately and integrated in equal parts

*Choose the alternative that fits best.*

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**You will answer the following questions using a four-point scale: Strongly disagree, Somewhat disagree, Somewhat agree, Strongly agree. You can also answer “Don’t know”.**

Please try to answer the questions to the best of your ability even if you may not have considered these issues previously.

Depending on how you answer, you may be asked to clarify your answer by checking different alternatives.

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**Views on democratic participation and digital technologies in the social science subject in grades 7-9 and upper secondary school**

Indicate to what extent you agree with each statement.

8. Social science teachers in school should address issues in their teaching that can be connected to democratic participation and digital technologies.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

9. Social science teachers in school should address issues in their teaching about how democratic participation, power relations, and digital technologies interact with each other in today's society.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

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## **Views on democratic participation and digital technologies in social science teacher education**

10. Social science teacher education should address subject-theoretical issues that can be connected to democratic participation and digital technologies.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

11. Social science teacher education should address subject-didactic issues that can be connected to democratic participation and digital technologies.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

12. If you answered "Somewhat agree" or "Strongly agree" to any of the questions about democratic participation and digital technologies, which aspects do you consider most important to address in social science teacher education?

Choose one or more alternatives, but maximum three.

- Ethical use of digital technologies
- Digital divides can be connected to other social divides
- The interaction between digital technologies and societal development reconfigures democratic participation
- Digital technologies can both enable and limit democratic participation
- Digital technologies place different demands on source criticism
- Digitally collected information is used to influence people
- Commercial interest steers the development of digital technologies
- Other, please specify: \_\_\_\_

13. AI technologies (e.g., ChatGPT) in society have implications for how social science teacher education prepares student teachers to teach about issues that can be connected to democratic participation.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

*The survey is based on a broad understanding of AI technologies ranging from generation of text, audio and video content to voice assistants, self-driving cars, and automated decision-making.*

14. If you answered “Somewhat agree” or “Strongly agree” to the question above, which aspects of AI technologies do you consider most important to address in social science teacher education?

Choose one or more alternatives, but maximum three.

- AI technologies' significance for society from an economic perspective
- AI technologies' significance for society from a social perspective
- AI technologies' significance for society from an environmental perspective
- AI technologies' significance for democracy
- AI technologies' significance for information flows
- AI technologies' significance for knowledge and skills that citizens need
- Ethical aspects of AI technologies in society
- Ethical aspects of AI technologies in education
- Guidelines for AI technology use in school
- Source-critical examination of content created with AI technologies
- Other, please specify: \_\_\_\_

15. Within the social science teacher education program, the responsibility for teaching about issues that can be connected to democratic participation and digital technologies should primarily lie with the social science subject (rather Core Education Subjects or the other school subject that social science student teachers specialize in).

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

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16. Issues that can be connected to democratic participation and digital technologies should be treated in a concentrated way in social science teacher education (e.g., in a single course or course module).

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

17. Issues that can be connected to democratic participation and digital technologies should permeate the entire social science teacher education program.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

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## Views on democratic participation and digital technologies in your own teaching

18. I have competence to teach social science student teachers about...

	<b>Strongly disagree</b>	<b>Somewhat disagree</b>	<b>Somewhat agree</b>	<b>Strongly agree</b>	<b>Don't know</b>
Subject-theoretical content that can be connected to issues about [school] students' democratic participation and digital technologies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Subject didactics that can be connected to issues about [school] students' democratic participation and digital technologies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AI technologies that can be connected to issues about [school] students' democratic participation and digital technologies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. I regularly address issues that can be connected to democratic participation and digital technologies in my teaching for social science student teachers.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

20. When I teach about issues that can be connected to democratic participation and digital technologies, I place greater emphasis on subject-theoretical content (the societal phenomenon) than subject-didactic content (how to teach about the societal phenomenon).

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

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21. As a social science teacher educator, staying up to date with technological development in relation to democracy issues is important.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

22. As a social science teacher educator, staying up to date with technological development in relation to democracy issues is a challenge.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

23. Social science student teachers often have better digital competence than social science teacher educators when it comes to issues that can be connected to democratic participation and digital technologies.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

24. I need professional development regarding issues that can be connected to democratic participation and digital technologies.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

25. If you answered "Somewhat agree" or "Strongly agree" to the question about professional development, what types of support would be most valuable regarding issues that can be connected to democratic participation and digital technologies?

Choose one or more alternatives, but maximum three.

- Regular updates on current research
- Workshops on practical teaching methods
- Individual mentoring from experienced colleagues
- General professional development on technologies in teaching (e.g., apps and platforms)
- Professional development on AI in society and in teaching and learning
- Time for collegial work and joint planning
- Collaboration with other teacher education institutions
- Collaboration with authorities
- Other, please specify: \_\_\_\_

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**Views on democratic participation and digital technologies in your own institution's social science teacher education program**

26. My teacher education institution offers sufficient support regarding teaching about issues that can be connected to democratic participation and digital technologies.

*Example: continuing education, sufficient time in courses.*

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

27. At my teacher education institution, it is clear which department/part of social science teacher education is responsible for teaching about content that can be connected to democratic participation and digital technologies.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

28. In our courses, there are clear expected learning outcomes that can be connected to issues concerning democratic participation and digital technologies.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

29. In my teaching, I address issues that can be connected to democratic participation and digital technologies even if such are not clearly mentioned in the courses' expected learning outcomes.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

30. I do not address issues about democratic participation and digital technologies in my teaching, but I believe that other social science teacher educators do so in their teaching.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

31. Issues about democratic participation and digital technologies are primarily addressed during social science student teachers' practicum.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Don't know

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### **Concluding Open-Ended Questions**

Below are two open-ended questions. You can write as much or as little as you want, but please use concrete examples to clarify your reasoning.

32. What significance does AI development have for how social science teacher educators need to prepare social science student teachers to teach about issues that can be connected to democratic participation and digital technology?

33. What are the main challenges that you encounter/would encounter in preparing social science student teachers to teach about issues that can be connected to democratic participation and digital technology? Please describe specific examples of challenges related to content, didactics, or personal/organizational conditions.

**NOTE! To later be able to withdraw your participation, you need to save a copy of your responses. You can download your responses on this page (the "Print" button) or on the next page (the "Download your responses" button).**

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## **Thank you!**

Your responses have been recorded. Thank you for your time and help! Your responses contribute to a better understanding of how social science teacher educators nationally view issues related to democratic participation and digital technologies in social science teacher education.

Reminder: To later be able to withdraw your participation, save a copy of your responses (the “Download your responses” button). If applicable, send the copy of your responses together with your request.

If you have any questions, please use the contact information below.

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