

From the Department of Women's and Children's Health
Karolinska Institutet, Stockholm, Sweden

EDUCATIONAL INCLUSION FOR STUDENTS WITH NEURODEVELOPMENTAL CONDITIONS

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EDUCATIONAL INCLUSION FOR STUDENTS WITH NEURODEVELOPMENTAL CONDITIONS THESIS FOR DOCTORAL DEGREE (Ph.D.)

By

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To my family. For the love and trust. To all children and youth. Be yourselves. You are perfect just the way you are.

POPULAR SCIENCE SUMMARY OF THE THESIS

SUMMARY IN SWEDISH/SVENSK SAMMANFATTNING

Bakgrund

Denna avhandling handlar om inkludering i skolan för elever med neuropsykiatriska funktionsnedsättningar (NPF), såsom exempelvis autismspektrumtillstånd, (AST) och ADHD. Den nya svenska skollagen (SFS 2010:800) lyfter fram att elever med stödbehov ska så långt det är möjligt undervisas i inkluderande skolmiljöer och med stödet implementerat i den reguljära undervisningen. En inkluderande skola ska vara anpassad så att alla elever kan uppnå mål och kunskaper, men även vara socialt inkluderande. En inkluderande skolmiljö tar hänsyn till alla delar av lärmiljön, den pedagogiska, den fysiska och psykosociala. Elever med NPF kan uppleva mer svårigheter i skolmiljö, de når färre kunskapskrav och är mer ofta socialt exkluderade, t.o.m. utsatta för kränkningar och mobbing. Antalet elever som mår psykiskt dåligt har ökat i både grundskolan och gymnasieskolan. Detta börjar bli ett allvarligt problem (SOU 2016:77, 2021: 30). I skoldebatten lyfts det fram att skolan ska vara likvärdig, och att så inte är fallet i Sverige idag, trots att vi borde ha goda förutsättningar att kunna erbjuda alla barn och ungdomar en likvärdig skolgång och en god hälsa. I en likvärdig skola får alla elever utvecklas utifrån egna förutsättningar, och där står lärande och kunskap i fokus. För att kunna utveckla en likvärdig skola behövs inkluderingskompetens. En kompetens där skolpersonal har förmågan att kunna anpassa lärmiljön så att den fungerar för alla elever. För att kunna förbättra behöver vi veta vad som fungerar och vad som inte fungerar för eleverna. Det är ingen lätt fråga och för att finna svar behöver vi forskning från många perspektiv. I denna studie vill vi undersöka vad eleverna själva tycker, om de är inkluderade i skolan, men även vad deras föräldrar och lärare tycker.

Skolor är sociala arenor och för att kunna vara delaktig i inlärningssituationer och aktiviteter krävs det sociala färdigheter, som hos några elever med NPF kan vara en nedsatt förmåga. Vidare kan det vara svårt med skolarbete som kräver välfungerande exekutiva förmågor, som också kan vara nedsatt hos elever med NPF. Ytterligare utmaningar som elever med NPF kan uppleva i skolmiljön är starka stimuli, mycket ljud och händelser i en samtidigt föränderlig värld. Lärare och annan skolpersonal har en viktig roll i att inkludera elever med NPF. Den förberedelse och de anpassningar som implementeras i lärmiljö behöver grundas i bred kunskap om vad som är fördelaktigt för elever med NPF när det gäller lärande och välmående. Lärarkompetens är en viktig faktor för inkludering. Det är sällsynt med röster från praktiken, dvs. att eleverna själva får skatta och utvärdera om lärmiljön upplevs som inkluderande. Skolan möter en naturlig varians av elever och en del av eleverna behöver anpassningar i undervisningen eller är i behov av särskilt stöd. För att kunna möta de krav som finns på att anpassa undervisningen utifrån varje individs förutsättningar och behov, behövs kunskaper och nya forskningsrön.

Utförande

Syftet med denna avhandling är att undersöka hur inkludering fungerar i praktiken för elever med NPF. Forskningsfrågorna och studierna är på mikro-nivå, och undersöker uppfattningar av lärmiljön samt interventioner av olika slag. De övergripande forskningsfrågorna är:

- Hur kan vi förstå inkluderande undervisning för elever med NPF i skolmiljön från olika perspektiv?
- Hur fungerar inkluderande undervisning i praktiken för elever med NPF och vilka nyckelfaktorer ser vi för utvecklandet av mer fördelaktig inkludering?
- Kan träning av sociala färdigheter öka skolpersonalens inkluderingskompetens och elevers egna möjligheter till en framgångsrik skolgång?

För att undersöka inkludering och interventioner som kan stärka inkludering har fyra delstudier genomförts. Den första studien är en systematisk litteraturoversikt som syftar till att undersöka vilka anpassningar som görs i lärmiljön för autistiska elever i reguljära skolformer. Den andra studien är en intervention där lärares självupplevda förmåga och inkluderingskompetens undersöks. Datainsamling i denna studie var enkäter före och efter interventionen som baserades på metoden lesson study. Interventionen bestod av tre cykler där lärare fick ta del av teori och evidensbaserade metoder utvecklade för elever med NPF. Frågorna i enkäten var både slutna och öppna. Lärare fick också besvara hur de skulle anpassa undervisningen för en elev som var beskriven som ett elev-case.

Den tredje studien undersöker hur lärare, elever och skolläda skattar en genomförd intervention i form av social färdighetsträning. Det vi undersöker är *social validitet*, dvs. om en intervention är acceptabel och genomförbar enligt de som deltar själva. Datainsamling i denna tredje studie var intervjuer med elever, från båda grupperna, samt med lärare och skolläda. Intervjusvar analyserades med tematisk analys. Jämförelser gjordes mellan alla grupper och även mellan träning som utfördes på plats och träning som blev virtuell på grund av Covid-19.

Den fjärde studien är en fördjupningsstudie på en tidigare storskalig enkätundersökning (Bölte et al., 2021) med olika yrkesgrupper på svenska skolor. Fördjupningsstudien genomfördes på sju olika grund- och gymnasieskolor i privat och kommunal regi. Studien undersöker lärmiljön med kartläggningsinstrumentet (INCLUSIO), som täcker in lärmiljön utifrån ett holistiskt perspektiv. INCLUSIO består av olika frågor som behandlar ämnen inom skolan som kan kopplas till inkludering och om man trivs, känner sig trygg och utvecklas i skolan. Det handlar bland annat om bemötande, studiemiljö och om man får det stöd man har rätt till. Frågorna anpassades för att fungera för elever, deras föräldrar och lärare. Det empiriska underlaget består av en sammanställning av elevers, vårdnadshavare och lärares svar på ett antal frågor som ställs strukturerat och i en särskild ordning.

Resultat

Resultatet från den systematiska översikten visar att det är sällsynt med riktade interventioner mot lärmiljön i svensk och internationell skolkontext. De interventioner som visade god

effekt på elevers lärande och hur väl de fungerar i skolmiljön var olika former av anpassningar riktade mot den sociala miljön, exempelvis skapa sociala klubbar på skolan utifrån elevers speciella intressen samt träna elevassistenter och kamrater till att inkludera elever med NPF i aktiviteter och interaktioner. Vidare visade att olika stödsystem god effekt när det gäller ökad självständighet eller för att kunna genomföra skoluppgifter mer fördelaktigt, bland annat stödstrukturer för att skriva text, belöningssystem och prompts för att kunna koncentrera sig på uppgifter, data-baserade program för att kunna arbeta självständigt och video-baserat stöd för att klara av övergångar mellan miljöer och aktiviteter. Resultaten från studie II visar att ett kortare professionsutvecklingsprogram för lärare och annan personal kan öka inkludering för elever med NPF. Lärare upplevde ökad själv-förmåga och kände till mer konkreta anpassningar efter genomförd intervention. I lärares gruppdiskussioner framkom att de värdesatte gemensam tid för att utveckla sin inkluderingskompetens. Resultaten från studie III visar att elever värdesätter att få träna på det som de tycker är svårt, och detta gärna i en naturlig miljö där de befinner sig dagligen. Eleverna som deltog beskrev utvecklade sociala förmågor och ett bättre välmående. Lärare som deltog såg också förändringen i skolans sociala klimat såväl som personlig utveckling hos enskilda elever. Lärare upplevde träningen som omfattande och rigorös, men ändå genomförbar i skolmiljö. Skolledningen såg också förbättringar i den sociala miljön och framhävde behovet av träning av detta slag på skolor för elever med sociala utmaningar. Alla tre deltagande grupper beskrev hur träningen ökade närvaron i skolan. Resultaten från den fjärde studien visar att lärare, föräldrar och elever skattar lärmiljön olika när det gäller inkludering. Lärare skattade så gott som samtliga områden som mer inkluderande än elever och föräldrar. En del områden hade mer samsyn, som t ex samverkan mellan hem- och skola och att man får visa sina förmågor med varierade metoder. De områdena med störst diskrepans var bland annat om man får individuellt stöd i klassrummet, om man förbereds på förändringar eller oförberedda sociala aktiviteter, om sociala grupperingar tar hänsyn till elevernas nedsatta sociala förmågor och om man får träna på att hantera känslor och reaktioner. När vi undersökte samband mellan variabler och vilka som har stor påverkan för inkludering, var det ett individuellt utformat stöd i klassrumskontext som hade störst korrelation med helheten, dvs. alla variabler sammanslagna (inkludering totalt).

Det sammanfattade resultatet visar att den psykosociala miljön kan utvecklas med olika former av interventioner och anpassningar. Den sociala miljön visade i samtliga studier inte vara tillräckligt anpassad och inte heller att elever fick verktyg att kunna hantera den med. Lärare behöver bredare kompetens om NPF, en specifik specialdidaktisk kompetens för att kunna genomföra anpassningar i alla delar av lärmiljön (pedagogisk, fysisk och psykosocial). Den strukturerade lärmiljön är steg ett, men är inte tillräcklig för att inkludera elever med NPF fördelaktigt. Specialpedagoger och speciallärare är en del av elevhälsan, men det är mer framgångsrikt om även all skolpersonal får mer kompetens om NPF. Interventioner, så som social färdighetsträning, ökad kompetens bland personal och evidens-baserade metoder för elever med NPF kan genomföras i reguljär skola för ökad inkludering.

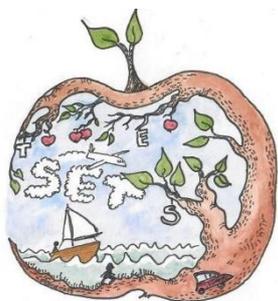
Slutsatser och förslag till åtgärder

Studierna i denna avhandling har ett värde för elever som behöver förståelse och anpassade pedagogiska, sociala och fysiska miljöer. På så sätt kan vi öka deras möjligheter till självkänsla, deras egenvärde och känslan av att vara en del i skolgemenskapen. Att vara inkluderad på riktigt. Studier har tidigare gjorts över elever med neuropsykiatriska funktionsnedsättningar som går i särskild undervisningsgrupp eller på särskilda skolor med utökad kompetens kring vad som generellt fungerar bra i lärmiljön, men det är inte lika vanligt förekommande att man har undersökt olika aspekter av inkludering i reguljära skolmiljöer. Den psykosociala miljön i reguljär skola kan förbättras genom olika interventioner, här kan ökad fokus på styrdokumentens del 1 och 2 vara ett sätt för skolutveckling, där gemenskap, solidaritet och empati lyfts fram. Lärare i studie III beskrev hur mycket utav skolans demokratiuppdrag som försvinner och få komma sekundärt, efter att man har undervisat om det gedigna innehållet till olika kurser. De såg att social färdighetsträning kan bidra till individer som fungerar bättre i samhället och är mer inkluderade. De reflekterade över skolans uppdrag och vilka förmågor som får ta utrymme. Detta kan även kopplas till välmående och hur unga människor klarar av samhällets krav. Studie I visade inga studier som undersökte eller hade välmående som utfall. Studie II visade att lärare blev mer medvetna om hur de bekräftar elever som upplevs som mer utmanande. Här reflekterade de över självbild och identitetsutveckling hos eleverna. Reflekterande lärare kan göra skillnad, och en intervention med mer specifik NPF kompetens kan vara ett första steg mot ett bättre bemötande av elever som behöver få växa, trivas och tillåtas vara sig själva. Lärare i studie II och III uttryckte alla hur viktigt det var att få tid till att öka sin kompetens och utveckla sin förståelse för elevers olikheter. Elever i studie III och studie IV uttryckte att de gärna hade tränat mer på självständighet och det de tycker är svårt. Här kan vi bli bättre i Sverige, på att utveckla elevers agentskap och förmågor som är bristfälliga. För att kunna göra det behöver vi veta i detalj vad som behövs och hur elever fungerar för att kunna genomföra riktade insatser.

Denna avhandling fokuserar på hur man kan ta tillvara och inkludera mångfalden bland individer, här unika elever i den obligatoriska grundskolan och frivilliga gymnasium. Genom att undersöka och belysa olika perspektiv kan elever i behov av stöd, som går i reguljär skola få dela med sig av vad som fungerar för dem. Det är även intressant att undersöka om vårdnadshavare och lärare delar bilden som eleverna har av skolan och skolsituationen, som vi har gjort i den fjärde studien. Resultatet visar att man skattar inkludering olika, och det är en viktig förståelse inför att vi ska anpassa lärmiljön, annars kan villfarelsen vara att det fungerar väl. Den sista studien visar att en del områden på skolor är mer välutvecklade och upplevs som mer inkluderande, medan andra har brister, särskilt den psykosociala miljön som också framkom som ett viktigt utvecklingsområde i alla de övriga delstudierna. Skolan har ett kompensatoriskt uppdrag och behöver stärkas vad det gäller att tillgodose alla elevers olika behov för att minska segregation och utanförskap.

Skolor som organisationer behöver också vara mer flexibla och följsamma. Det visar sig fortfarande att undervisning genomförs lika för alla elever, trots att det i våra styrdokument särskilt lyfts fram att undervisningen ska anpassas till varje elevs förutsättningar och behov

och att en likvärdig utbildning inte är synonymt med att undervisningen ska utformas på samma sätt. Det poängteras samtidigt att det finns olika vägar att nå målen och att undervisningen inte kan vara lika för alla. Mina studier visar att i dagens skola är det fortfarande mycket som är och görs lika. Slutsatsen blir att det inte är tillräckligt med undervisning som visserligen är av god kvalitet och innehåller för elever värdefulla delar så som en strukturerad lärmiljö, goda ledarskapsförmågor hos lärare och undanröjande av eventuella hinder i lärmiljön. Det behövs en inkluderingskompetens, som innehåller förmågan att kunna anpassa för elevers bredd i olikheter, en form av specialdidaktisk kompetens. Forskningen blir således viktig för att göra begreppet ”en skola för alla” mer trovärdigt. Ett sekundärt mål med forskningen har varit att synliggöra individer, som kanske vanligen inte får göra sina röster hörda så ofta, och öka förståelsen för vad just dessa elever behöver. För att kunna mäta inkludering i praktiken, behöver vi inkludera de personer som berörs mest för att öka trovärdigheten i det vi mäter. Framtida forskning kan i större utsträckning inkludera eleverna själva i forskning, ett sätt för att kunna leva upp till vikten av *nothing about us, without us* (Oliver, 2007, s. 112).



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ABSTRACT

Introduction: Inclusive education is the response to the human rights movement that requested equal rights to general education for all students, independent of their prerequisites and/or disabilities. Inclusion is different from integration, which concentrates on the capacities of an individual to adapt to a given mainstream. Inclusion demands that we change the existing educational environment in order to respond to the diverse needs of all learners. Inclusive education focuses on multiple aspects, such as participation, belonging and academic achievement. Teachers' attitudes, as well as their experience of working with children having neurodevelopmental conditions (NDC), is well described in the literature as crucial for creating and believing in inclusive values. The prerequisites for general teachers (e.g., professional development, supervision and resources) in mainstream school settings are poor. As the number of children on the autism spectrum and with attention deficit hyperactivity disorder in inclusive settings is increasing, the need for evidence-based strategies to facilitate inclusion has become urgent. Autism spectrum disorder (ASD) and Attention-Deficit/Hyperactivity Disorder (ADHD) are neurodevelopmental conditions associated with deficits that can make life in school harder, e.g., executive dysfunctions or social impairments. Little is known about the practical dimensions of inclusive education from different angles. Furthermore, there is a lack of views and perspectives from the students themselves, whose environment we are aiming to improve. Theoretical frameworks used for the design and interpretation of studies in this thesis are the bio-ecological model by Bronfenbrenner, the bio-psychological framework from the World Health Organization (WHO), the International Classification of Functioning, Disability and Health, the ICF Core Sets and the Human Environment Interaction model (HEI).

Objectives: This research examines inclusive practice for students with neurodevelopmental conditions. The overall aim of this thesis is to explore educational inclusion for students with NDC, focusing on how it works in practice and what key elements are essential for the development of more powerful inclusive agendas. For this purpose, four studies were conducted: a systematic literature review (study I), an intervention study for teachers' learning (study II), an exploratory study of social validity from social skills training (study III) and a multi-perspective study of lived experiences of educational inclusion (study IV).

Methods: Study II-IV consisted of a mixed methods design, with qualitative and quantitative methods, including participants with ADHD and ASD (adolescents), their caregivers and professionals (teachers and school management). Participants were recruited from mainstream high and secondary schools. Two of the studies are multi-responder studies. In study III, the responders are students, teachers and school management and in study IV, students, parents and teachers. The triangulation increases the validity through the convergence of information from different participants. Data collection tools are the literature search (study I), questionnaires (study II) and semi-structured interviews and structured surveys conducted through interviews based on the instrument INCLUSIO (study IV). The sample size in study II is $n = 26$, in study III, $n = 20$ (students $n = 13$, teachers $n = 5$ and

school management $n = 2$) and in study IV, $n = 56$ (students $n = 19$, caregivers $n = 17$ and teachers $n = 17$). Quantitative data in study II and IV was handled and analyzed with the SPSS (Version 27) and analyzed by descriptive and inference statistics. The interviews in study III were audio-recorded and transcribed verbatim with meaningful concepts extracted from the transcriptions and linked to social validity categories from the work by Wolf (1978) and analyzed through thematic analysis.

Results: The results based on the completed data collection show supporting and hindering areas in the school environment. Accommodations in the learning environment is a promising but understudied approach. Effective accommodations for enhancing learning for students on the autism spectrum found in study I are didactical accommodations for completing tasks and assignments, prompting procedures for on-task behavior, social interventions for better functioning and social inclusion and video-modeling for understanding and preparing for different situations in school. Professional development for teachers' learning towards improved self-efficacy and inclusive skills are effective, despite the lack of long-term perspectives. Training teachers in implementing evidence-based methods in practice can be done by lesson study cycles. Teachers' knowledge of concrete accommodations rose from the initial phase where assumptions about an improved learning environment can be made. Social skills group training is feasible in naturalistic settings, such as the school environment. There were generalizations of teachers' as well as students' skills. Moreover, the whole school's social environment was developed and improved. Results from study IV demonstrate large discrepancy in some of the areas significant for inclusion in school, e.g., direct instructions and individual support, available resources, the social environment and the responsibility for achievement. Parents and students express lack of sufficient support in the explicit classroom situation, e.g., with tasks and assignments. The teachers evaluated the learning environment as more inclusive than students and parents in most of the examined areas. Similar views and agreements were in the lack of competence among staff. For educational inclusion, most valuable was individual support, followed by functional response to behavioral characteristics and a structured learning environment.

Conclusions: As more students on the autism spectrum and other developmental conditions are attending inclusive environments, exploring and evaluating practice from multiple perspectives can ascertain what is working well and what is not. Furthermore, this research indicates how to improve inclusive education and contributes with evidence of how to enhance participation for students with NDC, e.g., by professional development for teachers and social skills group training for students. Our findings show that the students themselves are still regarded as the owners of the problem and the learning environment is not accommodating enough, where especially the psychosocial domain is neglected. In order to adjust the learning environment sufficiently to provide inclusive education, there is a need for further and more extensive competence regarding learners' characteristics and conditions associated with NDC. In order to provide an equal learning environment for all students, there is a need for inclusive special didactics. This study contributes to stakeholders and

educators as well as to the society as a whole in order to further strengthen the inclusive agenda.

LIST OF SCIENTIFIC PAPERS

- I. Leifler, E., Carpelan, G., Zakrevska, A., Bölte, S., & Jonsson, U. (2020). Does the learning environment “make the grade?” A systematic review of accommodations for children on the autism spectrum in mainstream school. *Scandinavian Journal of Occupational Therapy*, 28(8), 582–597.
- II. Leifler, E. (2020). Teachers’ capacity to create inclusive learning environments. *International Journal for Lesson and Learning Studies*, 9(3), 221–244.
- III. Leifler, E., Coco, C., Fridell, A., Borg, A., & Bölte, S. (2022). Social skills group training for students with neurodevelopmental disorders in senior high school: A qualitative multi-perspective study of social validity. *International Journal of Environmental Research and Public Health*, 19(1487).
- IV. Leifler, E., Borg, A., & Bölte, S. (submitted manuscript). A multi-perspective study of perceived inclusive education for students with neurodevelopmental disorders. Submitted to *Journal of Autism and Developmental Disorders*.

Scientific papers not included in the thesis, but relevant to the field:

Bölte, S., Leifler, E., Berggren, S., & Borg, A. (2021). Inclusive practice for students with neurodevelopmental disorders in Sweden. *Scandinavian Journal of Child and Adolescent Psychiatry and Psychology*, 9, 9–15.

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LIST OF ABBREVIATIONS

ABA	Applied Behavioral Analysis
ADHD	Attention Deficit/Hyperactivity Disorder
APA	American Psychiatric Association
AS	Asperger Syndrome
ASC	Autism Spectrum Condition
ASD	Autism Spectrum Disorder
CBI	Computer-based Interventions
CBT	Cognitive-Behavioral Therapy
DSM	Diagnostic and Statistical Manual of Mental Disorders
EBP	Evidence Based Practice
HEI	Human Environment Interaction model
ICD-10	International Classification of Diseases and Related Health Problems, 10th Revision
ID	Intellectual Disability
IEP	Individual Educational Plan
NDC	Neurodevelopmental Condition
NDC AI	Neurodevelopmental Conditions Awareness Intervention
NDD	Neurodevelopmental Disorder
PICO	Population, Intervention, Comparison, Outcome
PDD	Pervasive Developmental Disorder
PDD-NOS	Pervasive Developmental Disorder-Not Otherwise Specified
PECS	Picture Exchange Communication System
PMI	Peer-mediated Interventions
PRT	Pivotal Response Training
RCT	Randomized Controlled Trial
SENCOs	Special Education Needs Coordinators
SEN	Special Education Needs
SEND	Special Education Needs and Disabilities
SSGT	Social Skills Group Training
SSI	Social Skills Interventions

TEACCH	Treatment and Education of Autistic and Related Communication-Handicapped Children
UDL	Universal Design for Learning
WHO	World Health Organization
WWC	What Works Clearinghouse

1 INTRODUCTION

Education plays a significant role in improving many aspects of the quality of life, well-being and health for the individual. Educational equality and equity have two perspectives. First, they are a matter of fairness and ensuring the right of maximizing educational potential for all individuals (OECD, 2007). Personal or social circumstances should not be an obstacle. Second, they are about inclusion and good standard education for all. Equity is about ensuring that the education of all learners is seen as having equal importance (UNESCO, 2017). Since the declaration of Salamanca (UNESCO, 1994), the quest for inclusion has become an essential topic of education. Inclusion in schools stands at the center of attention in most high-income countries. According to the European Agency for Special Needs and Inclusive Education, “Inclusive education involves a systematic change that requires transformation in the way teachers and other education professionals are educated in terms of competence and ethical values” (2012, p. 19).

Making children more visible and moving their participation from marginal to central within schools provides more equal opportunities to belong, achieve and participate (UN, 2016). Philosophy, theory, ideology, visions and the pursuit for equity and equality in education is the ground to reflection and action. However, there is still a lot of work to be done in practice. Inclusion is an act, not just a statement. Far too long, researchers have discussed, analyzed or argued for inclusion with different perspectives, e.g., how theory can come into practice, investigating attitudes of inclusion, appropriately measuring quality of inclusive programs or focusing solidly on the discourse and terminology. All these aspects are essential and form a platform for how to design research within the field of inclusive education, but nevertheless, there is an urgent need for implementation and improvement science (Amor et al., 2019). The next step is to guide and develop the practice in action, make changes, and only then it is possible to build capacity in education systems and improve learning for all students.

Unfortunately, there are groups of students with poor academic outcomes. One specific group at risk for academic failure are students with neurodevelopmental conditions (NDC). For instance, there is a rich literature showing that students with autism (Ashburner, Ziviani, & Rodger, 2010; Jangmo et al., 2019; Stark et al., 2021) and with ADHD (Harrison et al., 2020; Holmberg & Bölte, 2014; Trout et al., 2007) are more likely than their typically developing peers to demonstrate low academic outcomes. Commonly, academic challenges increase as students with NDC advance from elementary to middle school (Harrison et al., 2020). Many of these challenges continue to secondary school, post-secondary education and employment. Inclusive school settings offer qualitative school settings and better academic achievement for students with special educational needs and disabilities, SEND (Florian, 2014). The way forward for societies and school systems is the inclusive way. However, inclusion cannot happen without the right support for students as well as teachers, at least not in practice. Autistic students who grow up without support or understanding are at high risk of having experiences that lead to mental health problems (Mandy, 2022). Research for how to implement and develop inclusive practices have made little advancement (Nilholm, 2020).

Now the next step is no child and no teacher left behind. There are many individuals who are diagnosed in adolescence or adulthood who have developed mental health problems (Simonoff, Pickles, Charman, Chandler, Loucas & Baird, 2008). The needs of students with NDC need to be identified early and efforts should be aimed at those in primary education. The support in practice should first be based on the acknowledgement of the role of the learning environment, which moves away from the medically oriented paradigm. Students with NDC are expected to live and function in a school environment that is unaccommodated to them, where the environment can misalign with their capacities and values. To explore educational inclusion from a micro-perspective, where the environment and the individual are in equal focus, is one way to develop interventions built on evidence and broaden the understanding of individual needs as well as the influence of the environment (Bronfenbrenner & Evans, 2000; Mandy, 2022).

At present, there is a discrepancy between inclusion goals and education inclusion reality (Nilholm, 2019; Persson & Persson, 2012), not at least for children with NDC (Stark et al., 2021; Pellicano, Bölte, & Stahmer, 2018). Closing the disadvantage gap means finding better ways to support students with NDC. In order to increase our understanding of factors in the school environment affecting educational inclusion, one step forward is to find effective approaches for prevention and intervention. This project sought to address and identify limitations, gaps and promising approaches in the learning environment for inclusive education. A multi-informant measurement design will give several perspectives of this complex phenomenon. This mixed methods design aims to contribute to the research field, where particularly the voice of the students themselves is a research gap (Falkmer, Granlund, Nilholm, & Falkmer, 2012; Humphrey & Lewis, 2008; Pettersson-Bloom & Bölte, 2022). The significance of the project is to contribute to stakeholders, educators and pre- and in-service teachers by exploring the current situation for students with NDC in Swedish mainstream school settings. The proposed studies in this thesis relate to school settings, improvement of practice, teacher education curriculum and society as a whole. This thesis makes a case for going beyond the advocacy of inclusive education to consider ways to promote inclusive teaching of students with NDC. This research argues for an integrated approach, where values from inclusive education are combined with traditions and methods from special education that serve inclusive purposes.

1.1 DISPOSITION

The compilation thesis has two parts; the first section is an introduction to the research area, the aim, research questions, the theoretical framework, methods and methodological aspects and details from all four studies. The first section also includes a summary of the articles and the results. Furthermore, the first part of the thesis evaluates and discusses the results of the four articles in relation to the overall research questions and aim of the research. The second section includes the four articles. The first study, “ Does the learning environment make the grade? A systematic review of accommodations for children on the autism spectrum in mainstream school”, reviews and synthesizes previous research on how the learning

environment is prepared in meeting the needs of students with NDC. The second and third study explore two different interventions in a school setting aiming to enhance inclusion. The first intervention, here described in study two, is an intervention aiming to investigate teachers' learning and capacity to create inclusive learning environments. The second intervention described in study three evaluates the social validity of social skills group training. The fourth study is an exploratory study that examines inclusive practice for students with neurodevelopmental conditions from a multi-informant perspective.

1.2 RESEARCH DESIGN

See Figure 1 for an overview of research designs in this thesis. Applications of educational inclusion are explored through a multi-stakeholder perspective with emphasis on students' voices. Children's and adolescents' voices are substantially underrepresented in research with focus on disabilities (Warren, Buckingham, & Parsons, 2020). Schools and classroom contexts, examined in this study, are part of the micro-systems (Bronfenbrenner & Ceci, 1994), where processes in the learning environment and the child's development are influenced by several factors, e.g., teacher responsiveness, peer interaction, available resources and teachers' self-efficacy. There is also a comparative analysis in the thesis from several standpoints, i.e., in the first study there are indirect comparisons between accommodations implemented in segregated or inclusive settings, in clinical versus naturalistic setting. In the third study, there are comparisons between participants in an active training group and a control group, between real life training and virtual training and between the three different groups of participants. In the fourth study, there are comparisons between the three participating groups for exploring discrepancy or similarity, in order to analyze the strengths and weaknesses in the learning environment according to inclusive education measurements.

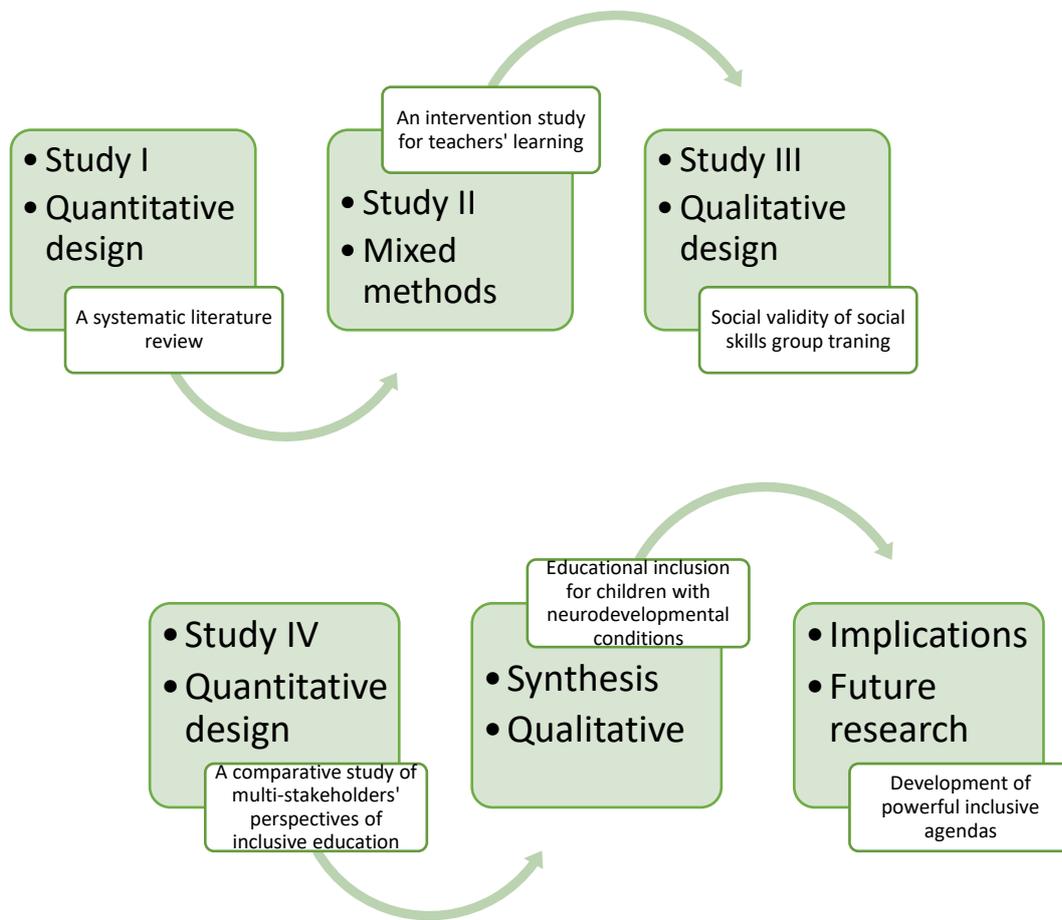


Figure 1. The research design.

There are many research approaches in inclusive education as well as in disability research. In this thesis, a few areas of interest regarding neurodevelopmental conditions have been excluded, and they are as follows: gender differences, socio-economical background, ethnicity and comorbidity with other diagnoses, e.g., intellectual disability. I do not treat or discuss the terminology regarding diagnoses and the person-first or identity-first perspectives. I use diverse terms as found and understood from the literature. Regarding the broad and multifaceted term “inclusive education”, there is no explicit focus in this thesis on the discourse itself, the history, the policy, the philosophy or full versus partial inclusion. However, some of these perspectives are included and treated briefly because they are needed for the state of the art. The research focus in this thesis is on applications in practice for educational inclusion for students with NDC.

The aim of this research is to explore inclusive education through the lens of students with neurodevelopmental conditions with an additional multi-stakeholder perspective. In the light of inclusion goals compared with inclusion reality, inclusive education for students with NDC is investigated and evaluated.

2 LITERATURE REVIEW

This section provides relevant conceptualizations and previous research. The theoretical framework will be presented at the end of the section. The concepts and terms discussed cater an overview of the object of knowledge, *Educational inclusion of children with neurodevelopmental conditions*. In the thesis, I use the concepts inclusive education and educational inclusion as synonyms. Inclusive education is open to different interpretations and more frequently used in the literature, where in this thesis the concept of educational inclusion is an attempt to reflect what we are aiming to explore. Inclusion, exclusion, diversity, special education and labeling learners have been in great focus of school debates in Sweden as well as internationally. There is an agreement and conviction for inclusive education. Nevertheless implementing, measuring or ensuring aspects of inclusion in practice is challenging and without a clear solution. The sections below start with inclusion from philosophical and theoretical perspectives and then move to shortly treat inclusion in policy. Thereafter, all further sections and perspectives of educational inclusion are aligned with aspects from practice, the micro-perspective, which is the main focus of the research area of this work.

Human rights, equal opportunities and social justice are core components in the heart of *Inclusive Education* (Armstrong, Armstrong, & Spandagou, 2009). A great body of literature has attempted to define and create consensus over Inclusive Education. A key point from this discussion and debate is that there is a variety of ways in which inclusion is used in both practice and discourse (Florian, 2014b; Nilholm and Göransson, 2014). “Education for All” and preparing schools for diversity are goals for the inclusive education system. The deficit- and labeling-oriented approach has been questioned. The inclusive school system, aligned with its philosophy, can accommodate all students no matter their prerequisites or disabilities, and principles for the learning environment should be the least restrictive to avoid stigma and marginalization (European Agency, 2018; UNESCO, 2005). Educational inclusion is a broad, multifaceted phenomenon, and not without its challenges. The full inclusion philosophy means educating all children in mainstream schools. The current trend is that more children with special educational needs and disabilities (SEND) attend mainstream schools (Florian 2014a). This educational change requires school systems that are flexible, knowledgeable enough about diverse learners and professionals with positive attitudes towards inclusion (Ainscow, 1999; Booth & Ainscow, 2002; UNESCO, 2022). For this purpose, all aspects of inclusive education have to be taken into account and where the micro-perspective is an essential part, in which inclusion is supposed to happen in reality.

Support for inclusive schooling is an increasingly significant act in international education policies (UNESCO, 2017). Inclusivity means respecting students from all backgrounds and cultures with different prerequisites and abilities. This is in line with international educational policy, where the Salamanca statement (UNESCO, 1994) is frequently highlighted as an important guideline for the educational system and how to improve inclusion.

Thus, developing more inclusive schools is a complicated and long-term process (Ainscow, 2006). In order to provide true inclusiveness, there is a need for qualitative assessments and interpretation of philosophy, policy and practice. Clearly, much progress has been made towards more inclusive schools where the focus has shifted and more attention is paid to teachers' responsibility and students' learning (Ferguson, 2008). Nevertheless, there are still poor areas and a need for further improvement, e.g., in didactics and overall adjustments in the learning environment (Stahmer, Rieth, Lee, Reisinger, Mandell, & Connell, 2015; Odom et al., 2013). This lack of adjustments of practice for several SEND students, e.g., students with NDC, is also well-known in the field of education research and evidence-based practices (Hume et al., 2021), even though there has been some progress and improvement. In this thesis, there is an explicit focus on inclusive education for students with NDC, e.g., ASD and ADHD.

Policy and documents have a clear vision of inclusion goals, however schools struggle to keep pace with these statements, acts and guidelines (Humphrey & Symes, 2013; Pellicano et al., 2018). The United Nations Convention on the Rights of Persons with Disabilities (2006) further sheds light on the importance of receiving the support required within the general education system to facilitate effective education. Pointing to implementation and evaluation of inclusive values and ideal educational settings for all requires a unit of analysis of policy and the individuals supposed to carry out policy in reality. There is a practical focus, mainly on the micro-level in this work, where the learning environments are being explored and compared from a bottom-up perspective by listening to multi-perspective voices from practice.

2.1 INCLUSIVE EDUCATION IN PHILOSOPHY, POLICY AND PRACTICE

The field of inclusive education is marked by a number of conceptual confusions and which organizational approach the researchers describe in their work (Göransson & Nilholm, 2014; Magnússon, 2020). According to Magnússon (2022, p. 3) there are four ways of how to view inclusive education:

- As a matter of bureaucratic organization—where the prerequisites for different students' education are regulated.
- As a matter of teaching and practical choices of teachers.
- As a matter of philosophy regarding definitions of equity.
- As a matter of activism and ambition to improve conditions for all students or for a specific group of students.

All these perspectives are essential in my work, where I believe in democratic rights, the right to belong to society no matter ability or disability—in other words, social justice for all individuals. Since there is a strong focus on the practical level in my research, the view of teaching and practical choices of teachers from the description of Magnússon (2022) is most central. Additionally, I see inclusive education in line with Wahlström and Sundbergs (2018, p. 171), much depending on how school-level and classroom-level practices are formatted

and shaped by individual teachers, principals, special educators, paraprofessionals, parents and students.

2.1.1 Inclusive education in philosophy

Educational inclusion, as well as the synonym inclusive education, are abstract concepts, difficult to define and understood differently regarding in which context the concepts are presented. The variations depend on different historical, geographical and theoretical contexts, even if they share the same basis and fundamental aspects as equity and social justice (Florian, Black-Hawkins, & Rouse, 2017). According to UNESCO (2022, p. 10), inclusion is a process that helps overcome barriers limiting the presence, participation and achievement of learners. Inclusive education is based on principles of equity, where equity is about ensuring fairness, where the education of all learners matters and matters equally.

Further, the recent report by UNESCO (2022) highlights the complexity of how to turn this principle into action, where it includes changes in thinking and practice within education systems.

It is important to distinguish inclusion from integration, where integration is a physical placement description of where the child with SEND is placed in mainstream school with little or no additional support and is expected to adapt to the curriculum and classroom environment (Batten, 2005). Educational inclusion is addressing issues of inequality by broadening access and participation for all children no matter prerequisites or disabilities. It has its focus on the environment and the responsibility of schools as organizations in reducing barriers for participation and learning. During the last decades, governments of many countries have promoted more inclusive education systems. The intention is, among others, to close the achievement gap between the highest performing students and those who do not perform so well. High-quality teaching can narrow the disadvantage gap; it is therefore encouraging that there are new reforms that recognize the importance of teacher quality (Slater, Davies, & Burgess, 2012). Despite changes to national policies, there seem to be issues in transforming theory and ideology into practice (Black-Hawkins, 2010). Debates about inclusive education and how the school system can arrange an education for all children have frequently included concerns with several dilemmas and tensions, e.g., social efficacy and measures of effective schools, full inclusion or part-time inclusion, celebrating diversity or creating segregated specialist settings, all children or children in need of support (Magnússon, 2022).

A good quality basic education is not only about physical placement; the learners have to be able to participate in a full range of educational experiences. Equitable education improves social cohesion and creates inclusive societies (Florian, 2010). However, inclusion and equality are a challenge for many school systems. The educational paradigm with a more market-driven school system can lead to implication problems for inclusive education. There are the ideologies of the market on one hand and concerns for human rights and equality on the other. In the neo-liberalism era, the government has an interest in school and requires

schools to work socially efficiently (Artiles, Kozleski, Dorn, & Christensen, 2006). The tension is between standardized achievement and results of a successful school and the access for disabled children. Pressures created by national policies lead to strategic dilemmas where schools feel obliged to rapidly increase in test and examination scores (Ainscow, Dyson, Goldrick, & West, 2012).

External factors limit the possibilities for developing equitable schools and might enhance hesitation towards including students with disabilities in mainstream settings. Skrtic (1991), known as arguing for a radical change according to inclusion, describes educational equity as a precondition for excellence in the post-industrial era. He claims equity is about learning collaboratively with and from persons with varying interests, abilities, skills and cultural perspectives. Furthermore, it is about taking responsibility for one's own learning and that of others. Ability grouping and tracking have no place in inclusive settings, and unity and cooperation are the norm. A successful school is a school that prepares young people to work together and develop a sense of social responsibility (Skrtic, 1991). Inclusive education is based on human rights and social justice and who has the right to belong and participate in a community or society. Inclusive education is an act aiming to serve and provide high-quality education for all learners (UN, 2016).

There is evidence that students with disabilities academically outperform their segregated peers (Fisher, Roach & Frey, 2010; Florian et al., 2017), which is a paramount quest for inclusion, where social justice, belonging and education of high quality is a priority and justifies educational inclusion. There are also studies showing fewer benefits for students with NDC in mainstream settings (Gindi, 2020; Stark et al., 2021). Due to difficulties in the mainstream school system in meeting unique needs, children and youth with NDC are at-risk for school failure (Evans, Roberts, & Habib, 2021; Gindi, 2020). Educational inclusion is not only academic achievement, it is as well development of positive identities and a society where all individuals belong and can be educated in the same setting. That setting for all students should nevertheless be organized with extra resources, by being flexible, adequate and by providing sufficient support. For this reason, and in order to understand educational inclusion in practice, there is a need to explore the exact situation of included students with NDC.

Inclusive education models have to be grounded in ideology as well as in the everyday experiences of regular education from different angles. Research in inclusive education brings together a broad range of interests and perspectives, i.e., critical theory, postmodernism and disability studies (Allan, 2008). This research of the educational inclusion of students with NDC is grounded in democracy, focusing on a specific group of students. A group which nonetheless is included in the larger body all students and which therefore also has the right to belong to all settings organized for schooling.

2.1.2 Inclusive education in policy

There are numerous acts and historic events that have formed the development of inclusive education as an economic, social and cultural policy internationally and nationally. The development of inclusive education values was first raised from the human rights-based perspective (Operti, Brady, & Duncombe, 2009), as indicated in the United Nations Declaration of Human Rights in 1948. A brief recollection of historic key events and documents of the progress of inclusive education are presented in chronological order in Table 1 below:

Table 1. International key elements and documents of inclusive education.

1989	Convention on the Rights of the Child
1990	World Conference on Education for All
1994	The Salamanca Statement and Framework for Action on Special Needs Education
2000	Dakar Framework for Action
2006	UNESCO Guidelines for Inclusion
2006	United Nations Convention on the Rights of Persons with Disabilities (Article 24)
2009	UNESCO Policy Guidelines on Inclusion
2015	United Nations Agenda 2030, Goal 4, Quality Education
2016	United Nations Convention on the Rights of Persons with Disabilities, General comment No. 4: The right to inclusive education
2022	UNESCO Reaching out to all learners

Several international legal acts and frameworks for inclusive education have been derived from the actions and documents above, where the Salamanca declaration is seen as the catalyst for more inclusive school settings worldwide. An inclusive school system has several aspects to take into consideration, where the inclusive direction starts with philosophy and

theory and what follows thereafter is the transformation of values into practice, to the micro-level, e.g., classrooms, teaching content and the surrounding environment. The Salamanca declaration (United Nations, 1994) stated that the education system must be designed to meet the needs of all children. Children with special education needs and disabilities should be educated in mainstream settings to best develop their potential. Furthermore, the United Nations *Convention of the Rights of Persons with Disabilities* (2006), Article 24, highlights the importance of no discrimination of students with disabilities and the right to access in mainstream schools. In the UK, *the Special Education Needs and Disability Act* from 2001 was established to ensure the legal rights of disabled students. In the USA, the *Individuals with Disabilities Education Improvement Act* (IDEA) from 2004 and the *Every Student Succeeds Act* (ESSA) from 2015 set the agenda in the education system. Many of these legislations require that students have the right to access general education curricula and environments (Ferguson, 2008), as well as high-quality education. There is no precise act or expressed legislation for students in need of additional support in Sweden. There are more general descriptions of how to reach out to all students no matter the prerequisites. Magnússon et al. (2019) argue for the necessity to analyze the context of the national educational policy in order to interpret and measure inclusive education. This is in line with Vislie (2003), who claims tensions and a different understanding of inclusive education are threats to the inclusion process and the further development of inclusive agendas. Holmqvist and Balli (2021) examined definitions of inclusion and captured four different categories found in literature: *classroom inclusion*, *basic inclusion*, *general inclusion* and *content inclusion*. Content inclusion is aligned with the broader knowledge of student diversity in order to avoid school failures by identifying risks in advance, similar to the definitions of inclusion used in this thesis.

There are no clear definitions of inclusive education in Swedish policy documents for compulsory school. In the existing documents, students in need of special support are supposed to be identified and investigated early by personnel in the school. The students in need of special support are not further specified or defined, e.g., no descriptions of medical or psychological diagnoses (Magnússon et al., 2019). The Swedish Education Act (SFS, 2010:800) states that students in need of additional support or with disabilities should receive their education within the regular classes. The support should be given within mainstream settings and should only be provided outside the regular classroom if there are special reasons for that. Since 2020, the Convention of the Right of the Child (UN, 1989) is a Swedish law.

Previous school investigations shed light upon the insufficient support (SOU, 2016:94; Swedish School Inspectorate, 2012; Bartonek et al., 2018) for groups of students, which presumably lead to the new goal in teacher education curricular (UD, U2020/00176/UH), with specific descriptions of how teachers are going to be more prepared in meeting the needs of students with NDC. Teachers of today are supposed to be able to identify and, in collaboration with others, cater to students' need of special education, including special education efforts for students with NDC. The new goal is thus a step towards a better

working inclusion agenda. However, there are future challenges in how this goal will be implemented and how it competes with other content in the teacher education curricula.

2.1.2.1 Lens on the Swedish context

Access to equivalent education for all is the basic principle guiding Swedish schools. The Swedish school system has long been internationally known as having an equitable and inclusive education system (Arnesen & Lundahl, 2006). Education acts and regulatory documents state that the Swedish school system is for all students (SFS, 2010:800). Students in need of special support are not to be treated differently and should receive the support needed in the regular school setting. Special education support should strive to be as much integrated as possible. The curriculum for compulsory schooling promotes all student attending regular classes if possible. In order to meet the needs of the students included in a regular setting, there should be inter-professional collaboration among staff with specific knowledge, i.e., a student health team. In the health team, there are, for example, a special education teacher, a special needs coordinator, a school nurse, a school psychologist and a school doctor. Sweden has taken legislative decisions towards inclusion of children without intellectual disabilities in mainstream school settings (Göransson, Nilholm, & Karlsson, 2011). Most countries, Sweden included, still have some form of separate special provision for students in need of support. The figure of Swedish students educated in segregated settings is 1.3 %. In-depth analyses of the Swedish school system and inclusion show a different picture (ibid.). The number of students who receive support in special or segregated forms fluctuates locally (Giota & Emanuelsson, 2011). There are segregated settings, the number of which increases in higher grades. However, many schools work in systematic ways in order to change the view that the student with learning difficulties should be taught somewhere else. Moreover, it also happens vice versa, and some schools start self-contained settings after failures in preparing and removing obstacles in the learning environment. Despite the endeavor for inclusion, literature shows increased levels of segregation of students in need of special education (Magnússon, 2022; Tah, 2019).

The Swedish Schools Inspectorate determined that it is the rule rather than the exception that schools have established adequate support systems for children with special needs in order to achieve inclusion in their natural educational environments (Swedish School Inspectorate, 2012; SOU, 2016:94). Swedish National Agency for Education and the National Agency for Special Education and Schools provide teachers in Sweden with support and guidelines according to inclusion and how to prepare the learning environment. The student health services have the overall student-in-needs' perspective on the micro-level, and they are responsible for guaranteeing that the schools maintain a good environment for all students. In order to achieve a good learning environment for all, there is a need for a high degree of collaboration between the teaching staff and the student health personnel. The latest documentation of students in need of educational support demonstrates shortages where support is given too late and is insufficient (SNAE, 2022).

One model with the attempt to improve the learning context and inclusion is the *Participation Model* (Delaktighetsmodellen). Participation is a concept highly linked to inclusion. In the participation model, all aspects of the learning environment are taken into consideration and adjustments are made in the physical, educational and psychosocial environment. This is in line with the arguments from several researchers about inclusion just as a placement matter, where educational inclusion includes more aspects than just where the students are educated (Magnússon, 2020). Nevertheless, the participation model is abstract and without practical guidance for teachers. Moreover, in Sweden, to promote inclusion and student achievement, there are special educational needs coordinators in the student health team, who have the overall responsibility and are in charge of coordinating the support to students and supervising school staff. Furthermore, it is the principal's duty to be aware of, map and provide individual education plans for students with special educational needs. On the classroom level, teachers have a great responsibility in adjusting the teaching and tasks. Teachers in mainstream Swedish schools are supposed to be knowledgeable enough to meet all students, however with the possibility of consulting the special educational needs coordinators or special needs teachers. There is a limited body of research in Sweden on practical levels of inclusion and even fewer with the perspectives of students with NDC and inclusive education (Linton, 2015).

In 2012, a large-scale longitudinal research development program on inclusive learning environments in school was initiated and conducted in 12 municipalities and 31 schools (Öhman & Schad, 2017). The results from the project summarized success factors for improving inclusion, such as that inclusion is a process and each school must undergo that process, starting at the position and conditions of that specific school to be able to build a common value ground for inclusion. The teachers in the process were able to go from ideology to practice, which previous literature features as particularly challenging. As the teachers gained more knowledge, their views on inclusion transformed and thus on what is problematic, the student or the environment.

In a scoping review, Kessel et al. (2019) explored the right to education for autistic children in Denmark, Finland and Sweden. All countries have incorporated the values of the Universal Declaration of Human Rights and the Convention on the Rights of Persons with Disabilities in the education system. In 2010, there was a new Education Act implemented in Sweden, in which autism was no longer treated identically to intellectual disabilities. According to the new act, inclusive education and placement in mainstream settings are the recommended placement. Segregated settings should be used only as a last resort. Special educational needs coordinators' support should be addressed in the mainstream setting. Teachers are trained in all levels of Higher Teacher Education, however the explicit content of autism training or overall NDC knowledge is scarce. This is an area of improvement in training pre-service teachers and research, where the new goal for teacher education might properly address these issues for reducing the gap between students' learning and attainment.

The differences among students' learning and educational inclusion in Sweden are mainly a between school phenomenon, along with a within school problem, where resources might be poor and SEND children's different needs concurrent with each other. Furthermore, the correlation between the rise of school choice and decreased equity and increased social segregation is a threat to educational inclusion (Magnússon, 2020). Another threat to equal education is the decentralized education system, which has disadvantages for inclusion and special education, where support for children must be financed within the regular school budget. This economic aspect jeopardizes inclusive education and the support for students in need of more support (Meijer & Watkins, 2019). During the past two decades, internationally standardized assessments, e.g., the PISA report, show a continuous decline in the performance of Swedish students (Swedish National Agency for Education, 2011). National goals, set by the government on the macro-level, are supposed to be fulfilled by the local schools on the micro-level, however with funding cuts and small budgets. The responsibility mandated by the Education Act that all students should be guaranteed an individually adjusted education is remarkably very much left to the school management and the teachers themselves. Currently there is a discrepancy between inclusion goals and educational inclusion reality (Nilholm, 2019; Persson & Persson, 2012), not at least for children with NDC (Pellicano et al., 2018). This is also true for Sweden (Bartonek, Borg, Hammar, Berggren, & Bölte, 2018), although it has long been one of the pioneers for inclusive education along with the United States, Canada and the UK (Artiles et al., 2011). In a recent study by Stark et al. (2021), comparing academic achievement among autistic students and their peers, only 57 % (neurotypical 86 %) of the students were qualified for upper secondary education. The exploratory studies of educational inclusion described and presented in this thesis are conducted within Swedish mainstream school settings.

2.1.3 Inclusive education in practice

In this section, inclusive education is aligned with stakeholders in practice. The section starts with teachers, followed by parents and students. School management is excluded, even though inclusive education is much formed and developed by inclusive management and leadership. All following sections in the background chapter hereafter are aligned with inclusive education in practice and aspects of educational inclusion.

Teachers are key policy-makers in practice, and their decisions in the classroom determine what students experience and learn. Teachers make a difference, no matter the school setting. It is the quality of teaching that makes the biggest difference to students' learning (Mitchell & Sutherland, 2020). The basis and values of inclusive education are starting points which have to be further transformed into practice, and this is achieved through teachers and other personnel in the school environment. However, teachers cannot transform a new paradigm, such as educational inclusion, into practice for the school system if no teacher education curricula enhance their competence towards teaching all students in the class and maintaining classroom diversity. Forlin (2010) highlights two elements as significant for the development of an inclusive pedagogy in teacher education, and they are: responding to teacher needs and

strengthening pre-service teachers' self-esteem regarding their work and future teaching in multicultural contexts that are becoming increasingly diverse, as well as encouraging that teacher students represent that diversity themselves.

Educational inclusion for students with NDC is not only a matter of the placement where teaching and learning take place, but it is also a more holistic approach where spatial, social and didactical aspects are core components. The most effective approach for optimizing learning and well-being could be the mainstream school setting if the setting provides adequate and sufficient support (Hornby, 2021). Inclusive didactics is a curriculum adapted to students' different needs and individuality. According to the Swedish Agency for Education (2011), a challenge for Swedish teachers is handling the aspects of social and didactic inclusion (SNAE, 2011). Teachers are the ones to realize inclusive didactics and transform policy into practice, but this is not without its challenges and obstacles (Florian & Black-Hawkins, 2011). Details of evidence-based methods for the inclusive classroom that are valuable for students with NDC are further presented in the section after the description and umbrella view of neurodevelopmental conditions.

2.1.3.1 Teachers and inclusion

Some literature shows positive teacher attitudes towards inclusion. However, they see several barriers, e.g., inadequate resources and lack of teacher preparation (Avramidis & Norwich, 2002; Humphrey & Symes, 2013), where some needs and disabilities are described as more challenging than others (de Boer, Pijl, & Minnaert, 2011). Undeniably, there is not enough teacher training for meeting diversity in the classroom (Alexander, Ayres, & Smith, 2015; Bartonek et al., 2018; Forlin, 2010). In the move towards inclusive education, teachers are core factors and in the center of change in schools, with the capability of meeting all children, with or without disabilities. Overall, there are major concerns regarding the practical implementation of inclusive education, where teachers and other professionals are main implementers and where the "how to do it" needs further investigation.

For a more inclusive approach, teachers need support of their own as well as extensive knowledge to be able to respond to all different learners and have the sensibility to avoid marginalization (Florian 2014b; Norwich et al., 2021). Pre-service teacher training programs seldom provide education about NDC (Bölte et al., 2021a; Goldman & Gilmour, 2021) despite the prevalence of NDCs being approximately 10 to 15 % (Boyle et al., 2011). Hence, there is a new goal for teacher education programs in Sweden (U2020/00176/UH), where all teacher education programs from pre-school to secondary and occupational school cover content regarding NDCs, aiming to improve inclusive education for a vulnerable group of students. Teacher education reforms have an important role in supporting teachers and the development of inclusive education (UNESCO, 2017).

Internationally, there seems to be the same issue with a lack of adequate knowledge among teachers in meeting the needs of the classroom diversity (Pazey, Gevarter, Hamrick, & Rojeksi, 2014), where teacher training and experience of teaching children with NDC grant

more positive attitudes towards inclusion (de Boer et al., 2011; Toyle, Wilson, & Wardle, 2019). Teachers have a significant role in the successful inclusion of students with NDC and lack of sufficient training or experiences can successfully include or exclude students. The challenge with inclusive education has recently been more frequently addressed by teacher educators (Florian & Camedda, 2020). The focus is now on the narrow perspective of inclusion, highlighting the needs of specific learners, i.e., SEND children. However, at the same time, the focus is also on a broader perspective of educational inclusion and incorporating the different needs and backgrounds of the students. Undoubtedly, teachers need broad competence to meet classroom diversity. Hummerstone and Parsons (2021) have compared autistic students' perspectives with their teachers on how to improve learning and inclusion. In the responses, there were similar areas of weakness, such as teachers having issues in focusing on both the needs of the group and the needs of individual students. The students expressed a wish for more understanding from teachers regarding difficulties, e.g., sensory issues and how the environment could be adjusted to provide effective support. The study by Hummerstone and Parsons (2021) is in line with Bartonek et al. (2018), reporting teachers' lack confidence in teaching students with NDC. This aligns with Ravet's (2011) integrative position, where teachers need a good understanding of the condition, here autism, in order to be able to respond effectively to the specific needs of every child. Teachers' attitudes can however be affected by discourses of the psycho-medical perspective and belief they are not qualified to teach classroom diversity. If teachers see students as the owners of their problem, there is a risk that the teachers will feel insufficient to handle the task (Thomas & Loxley, 2007). Thus, teachers with more experience of teaching diversity gain more positive attitudes towards the inclusion of all students (de Boer et al., 2011). Resistance to inclusion among teachers is reduced when obtaining special education qualifications (Avramidid & Norwich, 2002; Sharma, Forlin, & Loreman, 2008).

There are frameworks for inclusive teachers and teaching (UNESCO, 2022). The European Agency for Special Needs and Inclusive Education (EASNIE) has developed a framework with core values and areas of competence for teachers. The framework was developed to assure that Universal Design for Learning (UDL) principles could be applied. Inclusive skills for teachers are described as follows (EASNIE, 2012, p. 19):

- *Valuing Learner Diversity*—learner difference is an asset to education
- *Supporting All Learners*—having high expectations for all learners' achievements
- *Working With Others*—collaboration and teamwork are essential approaches for all teachers
- *Personal Professional Development*—teachers take responsibility for their lifelong learning

Clearly, it is imperative that teachers in today's inclusive classrooms need to gain, maintain and develop an extensive knowledge of the individuals within their diverse cohort of learners. The question for teachers remains: who am I teaching and how can the pedagogical content, the physical environment and social environment be available for all? Literature demonstrates

challenges in inclusive education in practice, and this project aims to explore more in-depth what these challenges, as well as opportunities, are in practice.

2.1.3.2 Parents and inclusion

School-choice and selecting the best environment for your child with special needs is a parent concern. Among parents' perceived threats for inclusive settings are inadequate teacher knowledge and insufficient adjustments in the learning environment (Andersson, 2020). Parents' perspectives and worries regarding school inclusion have been explored by Falkmer, Andersson, Joosten and Falkmer (2015). In their review, they ascertain several key factors for inclusion according to parents, e.g., relations with teachers and the teachers' ability and flexibility to implement strategies that promote an inclusive classroom. Furthermore, leadership played an important role in creating a school ethos with positive attitudes and removing barriers. Collaboration strategies as well as social support, transition planning and specific ASD knowledge were further significant success factors for inclusion possibilities and fulfillment.

Literature shows a poor picture of certain areas for students with NDC in inclusive settings e.g., lower participation (Falkmer et al., 2012), social exclusion (Humphrey & Lewis, 2008; Humphrey & Symes, 2013) and higher levels of anxiety and development of mental health difficulties (Andersson, 2020). In a large study, Andersson (2020) reports reasons for school absenteeism among Swedish students with ASD, where the absenteeism was a consequence of lack of teacher competence and inadequate adaption of teaching towards students' special needs. Andersson found that approximately 50 % of the students did not achieve approved grades in core subjects. When mainstream school has difficulties in meeting the needs of students, parents prefer resource- and special schools. Holcombe and Plunkett (2016) support this picture, where teachers have great difficulties in implementing accommodations and appropriate supporting strategies, despite some knowledge of student diversity. This brings importance to further examining and analyzing inclusive education in practice to avoid inclusion as an illusion in mainstream school settings (Pellicano et al., 2018). There is good evidence both internationally and nationally that parents value provision where their child's needs specifically related to their diagnosis are well understood and supported (Warren, Buckingham, & Parsons, 2020). In a large-scale study, Paseka and Schwab (2020) examined parents' attitudes towards inclusive education and which children could be taught together. Children with physical or learning disabilities were most seen as possible and positive to include, where there were fewer positive responses towards including students with behavioral disorders or with mental disabilities. Moreover, when it comes to parents and inclusion, reasons for parents to choose mainstream schools are the right for equal chances, the opportunity of integration, the interpersonal relationships that the children may establish and the assimilation of the typical way of life (Salceanu, 2020).

In Sweden, parents can choose the school for their child, where an independent school is an option. Independent schools have increased in number during the last decade, and there are independent schools, also called special schools, with the profile of teaching students with,

e.g., NDC. Recently, there was a new political decision, enhancing the possibilities parents have for choosing a school with additional resources for SEND students (Regeringskansliet, 2022). The regular school system has difficulties in including all students, and therefore there is a need for more resource schools.

2.1.3.3 Students and inclusion

Inclusive education provides all students with access to flexible learning choices and the best paths for achieving educational goals as well as a sense of belonging and well-being.

Listening to the students themselves is crucial in order to provide sufficient support in school and measure inclusive education in practice. Furthermore, it is a question of human rights, as the UN Convention on the Rights of the Child (1989), Article 12, assumes children's right to express their views on matters affecting them. Even though schools are designed for children and young people, their voices are seldom heard regarding what works or not in the school environment. Moreover, there are even fewer voices from vocal minority groups, e.g., autistic students from most age groups (Warren et al., 2020; Petersson-Bloom & Bölte, 2022).

Saggers, Hwang and Mercer (2011) examined autistic high school students' perspective of the key factors of successful inclusion. An important aspect for the students was a supportive school culture, where friendships played a critical role in creating a safe environment. This is in line with the recommendations from Morewood, Symes and Humphrey (2011), where school values, peer education and awareness are preventative dimensions of effective inclusion. Moreover, clear instructions from teachers and understanding of individual needs were particularly essential. Experiences of bullying existed even though the psychosocial environment was described as safe, which highlights the importance of social and peer support. Measuring values of inclusion and how optimal learning takes place in reality for groups of students is challenging. However, the students' voice can contribute to the science of improvement and therefore transform knowledge into action. The students' voices need space, audience and influence, as well as opportunities to contribute to the education discourse (Saggers et al., 2011). This might even be more essential for SEND students.

Inclusive values and an equal learning environment can be explored through the students' lived experiences, and thus an additional objective of this study is to provide the opportunity for a minority group to express what is working well in the mainstream learning environment without comparison with other school-forms and what needs further attention and improvement. The responses from the students are compared with the responses from caregivers and the teachers teaching the participants.

2.2 SPECIAL EDUCATION

This section includes a brief discussion of the frames of reference that are related to schools and children's learning in relation to special education and special educational needs. One way of understanding special education needs is that it refers to difficulties in learning that require special education provision. The label "special education needs" tells us nothing specific about the student and his or her learning or prerequisites for teaching them. Florian (2014) conceptualizes the concept of SEN with the broad definition, extending beyond

categories of disability, to include all children who are in need of additional support in the school system.

The definition of special education as provided by Salend (2011, p. 7):

Special education involves delivering and monitoring a specially designed and coordinated set of comprehensive, research-based instructional and assessment practices and related services to students with learning, behavioral, emotional, physical, health or sensory disabilities. These instructional practices and services are tailored to identify and address individual strengths and challenges of students to enhance their educational, social, behavioral and physical development and to foster equity and access to all aspects of schooling, the community and the society.

It is important to understand what the frame of reference brings when we judge the learning and behavior of students identified as having special education needs, and if we allow for and understand these students in the same way as others. Frames of reference associated with the SEN label may carry positive or negative connections in relation to the individual students (Wearmouth, 2012). When using the label SEN, teachers and other personnel might see the child as the owner of the problem. Moreover, there is a question about appropriate expectations of children identified as having SEN, since there is a strong relationship between teachers' expectations and students' achievement and development (Mitchell & Sutherland, 2020). When students are classified as with SEN, there is a risk for them to become marginalized within the school, where the still ongoing challenge remains as to how to manage and bring attention to students in need of additional support without enhancing stigmatization and otherness.

Identifying learners with SEN is a subtle and complex process, including the fact that it is some sort of categorization with pros and cons for the child. However, in order to communicate efficiently and effectively, a common language is needed for reflection and deeper learning, e.g., for teachers and other professionals. Riddick (2012) suggests further thinking of the advantages and disadvantages of identifying the needs of an individual child at a given time in a given context. Identifying children should not be seen in black and white terms, and the categorization is part of the process and how to understand the needs of the child. According to Riddick, advantages for the child are acknowledging and accurately understanding the learning difficulties and knowing what type of support can be adequate and sufficient. Identifying the needs and naming them can lead to greater self-awareness for the child (Cann, 2007), and at the same time, to further acceptance of the child's behavior in the community, which creates greater tolerance and a friendlier environment (HM Government, 2021). Disadvantages of labeling can lead to less focus on the poor learning environment and the child is seen as the one owning the problem and as the one who should change in order to fit in. Moreover, some labels are viewed more negatively and can lead to further stigmatization (Riddick, 2012). In Sweden, as well as internationally, there is an ongoing debate among scholars about the language in use, and there have been changes in the discourse and terminology, e.g., from students *with* NDC to, for example, neurodiversity and

autistic students. In addition, there have been ambitions to reduce segregated settings and to provide and organize the special education in mainstream settings.

There are scholars (Hacking, 2007; Persson, 2019; Tomlinson, 2012) who argue that too much focus on disability and disadvantage will manifest and stigmatize difficulties and differences. This sheds light on the importance of how labeling children might influence teachers and their surroundings in general. Parents' and teachers' ratings indicate that behavioral problems are associated with stress (Lecavalier, Leone & Wiltz, 2006), where considerations of how the environment can prevent and hinder problematic behavior without adding a stigma have to be taken into account. On the other hand, there is a need for a discourse and a shared conceptual platform to understand disadvantages and to discuss what needs to be done in the learning environment. The common language or discourse is necessary to be able to learn, transform and make progress. The focus on a group of learners, e.g., students with neurodevelopmental conditions, can lead to narrowly focused effects where the student is supposed to adjust and try to fit in to the environment (Ainscow, Dyson, Goldrick & West, 2012). The question is how to change the fact that some children are still categorized as "special" and therefore "different" and viewed as being in need of specialists or education outside of mainstream school, respectively. Nevertheless, if we do not raise awareness about students at risk for underachievement, changes are hard to introduce and evaluate. Research shows that paying attention to specific groups of learners and implementing evidence-based practices around their education will improve their behavior and performance, but there is also spin-off to the school staff and procedures, making the school a better learning environment for all students (Ainscow et al., 2012). It is insufficient to focus solely on one perspective, i.e., either the environment or the individual.

Within the education system, the move towards schools with enhanced knowledge about explicit diagnoses and specific learning difficulties is part of changing practices to become more inclusive. A broad literature shows enhanced NDC knowledge among school staff impacts the ability to solve problems and plan well educationally (Tobias, 2009; Rusell, Schriney & Smyth, 2022) as well as more positive attitudes for inclusive settings for the students (Russell et al., 2022). In this sense, labeling or identifying children has an educative function, aiming to draw attention to misunderstood and marginalized children for improved learning and belonging in the community. Diversity agendas must focus on general characteristics of learners as well as on certain categories of impairment to provide learning for all. This is essential in inclusive education and a core commission for the education system, and in practice, teachers and other professionals are the ones that shall fulfill education policy. For deeper reflection and gaining knowledge, our language is a well-known prerequisite, and without a common language and the neuropsychiatric discourse, vulnerable learners will remain invisible. Inclusive education systems going beyond the focus on impairments, difficulties or disabilities have not been realized. This is also true for Sweden (The Swedish school inspectorate, 2012; SOU, 2016:94, 2021:30), where schools have hardly been shown to be conducive to educational excellence or equity for children with NDC.

Traditions of Inclusive Education and Special Education are often described as contrasting philosophies. Special Education derives from the presumption that there is something additional or different with learners, whereas Inclusive Education traditions argue that all children are part of the normality and differences among students are part of human development (Florian, 2014b). In Inclusive Education there are no categories of children, whereas Special Education identifies children as special. As such, there is a dilemma that arises from the positive and negative conceptions of human differences. The negative is the risk of stigmatization and otherness, whereas the positive is highlighting diversity. To sum up, recognizing differences as a tradition of Special Education can lead to different provision. However, not recognizing differences can lead to insufficient or deficient support. The inclusive education scholars highlight the shift from “some” to all students, but nevertheless at the same time use the term *celebrating diversity*, where diversity is then all students no matter the prerequisites, abilities or disabilities. Celebrating and embracing diversity, where there is responsiveness to individual strengths and challenges, will provide all learners with qualitative education according to inclusive scholars (Thomas & Moxley, 2007). Inclusive education focuses on the learning environment, school curriculum, school climate and barriers to learning (Norwich, Benham-Clarke & Goei, 2021). Nonetheless, including students with SEND in mainstream classroom requires adjusted didactics (Bruun, 2017; Hornby, 2015), and providing inclusive education means responsiveness towards individual needs, where special education provision prevents students’ difficulties in learning. In the section below, there is a presentation of a synthesis where two traditions, seen as contradictions, are combined.

2.2.1 Inclusive Special Education—a new lens

2.2.1.1 Inclusive Special Education

As we approach the 21st century, there are still divergent views concerning the mission and culture of the educational system and the discourse about inclusive education. How the educational system and schools address the needs of students with SEND differ based on context, country and culture. Inclusive education and special education approaches are based on contrasting philosophies and provide alternative views and settings for children with SEND (Hornby, 2015). In Hornby’s description of combining inclusive education with special education, *inclusive special education*, understanding and teaching children with SEND requires a synthesis of inclusive education and special education to encompass optimal learning for children in need of more support. This is in line with Opertti et al. (2014), where they suggest an approach above the key policy dilemmas and tensions around inclusive education and special needs education. They promote how the core ideas of inclusive education, special needs education and marginalized learners can create fruitful guiding principles towards inclusion. This happens by, according to the authors, recognizing and combining positive initiatives and achievements of the different traditions, all within the rights-based perspective.

Inclusive education, as mentioned before, is a multidimensional concept that includes the celebration and valuing of difference and considers human rights, social justice and equity issues (Skrtc, 1991). It also encompasses focus on children's entitlement and access to education to participate in society (Artiles et al., 2011). The broad definition of inclusive education supports acceptance of all individuals and the right to belong to a community. Moreover, it is about the right to high-quality education, with flexibility and the ability to respond to all different needs of all children. Combining the two fields, inclusive education and special education, can contribute to further understanding of how to meet all the different needs in the classroom. All different needs are met by providing sufficient and adequate support, where evidence-based methods originally derived from the field of special education are implemented in the school setting. Looking at it with this lens, diversity is celebrated and met in different ways.

Central to the discourse by Hornby (2014) is the adoption of evidence-based methods for teaching students with special needs in an environment built with and based on the philosophies of inclusive education. This approach is similar to the integrative position as taken by Ravet (2011), where elements from inclusion values can be combined with elements from special education. The necessity for developing and interpreting the integration model will provide professionals in the field of education with tools to facilitate the provision of effective education for all students. Additionally, the inclusive special education discourse can provide a new philosophy and guidelines for policies and practice and therefore create a bridge among contradictory views. This can further focus on and establish an avenue of how to close the gap between the highest and lowest achievers in the school system and fulfill the goals of inclusion. The way we conceptualize inclusion will affect the education system and its educational content. Inclusive special education combines two fields and can thereby develop new approaches for children with NDC in the Swedish school context. A key component of inclusive special education is the provision of training and support for mainstream classroom teachers in order to provide teacher confidence and self-efficacy in teaching children with a wide range of SEND (Hornby, 2015).

To conclude, this approach, *inclusive special education*, welcomes diversity where all children belong. However, in order to reach everyone's full potential, interventions and strategies from traditions of special education are integrated into the inclusive environment as a natural part of pedagogy and didactics. Interventions, methods and strategies originally from special education, the effectiveness of which is supported by strong bases of research evidence, are prerequisites for creating powerful inclusive agendas. Schools and the education system are not without challenges and dilemmas. Using inclusive special education as a starting point can help stakeholders to overlook contradictions and begin to act. This project approaches this new perspective, where educational inclusion for students with NDC starts with the right to belong and participate in mainstream schools. However, the students should not be left without adequate support and adjustments in the learning environment. Some inclusive education researchers may see the merger as difficult or impossible, and thus the way forward might be the art of special didactics.

2.2.2 Special Didactics

The term special didactics is not frequently used in the literature, however the origin of the term, didactics, is broadly represented. Mårtensson (2017) describes the term as linked to students with special education needs and the art of teaching. In special didactics, the didactical questions of what, why and how have an additional, more explicit focus on who is being taught and the learners' characteristics. However, supporting or teaching students with special educational needs should be part of a proactive approach, not an add-on, and barriers in the learning environment should be identified and prevented in advance. This means that in teacher preparations and for teaching students with diverse needs, an extensive knowledge of the special didactic difficulties that can occur in ordinary education is needed (Holmqvist, 2020). Teaching that reaches out to all learners is not instrumental, and the teachers of today need relational competence, communicative competence and competence to develop and enhance students' self-efficacy and self-image (Bruun, 2017). Special didactics is defined by Bruun (2017) as a combination of general didactics, special didactics and process didactics, and which helps the planning of teaching that meets the needs of diverse students. In this approach, the philosophy of inclusion where all students belong and have the right to qualitative education can be combined with the theories from special didactics, where teaching needs well thought out planning, in advance, to meet all learners. To plan and teach for diversity requires broad skills, and the SEND Code of Practice (Department for Education, 2015) highlights four significant areas of knowledge: cognition and learning, communication and interaction, social, emotional and mental health and sensory and physical needs. Considering these areas is the first step towards a more nuanced understanding of the students' needs and their relationship with the learning environment. This aligns with the aim of the ICF framework (WHO, 2001), a system that can describe and understand the health-related functioning of students with a holistic view. The ICF allows for and exemplifies several aspects of the child's life, where the contextual factors have importance for the functioning of the child and where adjustments, differentiation and adequate treatment are core components. If students require special and individualized support, the didactics can and should be adjusted in order to meet the needs.

2.3 NEURODEVELOPMENTAL CONDITIONS

This section provides overall descriptions of the neurodevelopmental conditions that are the explicit focus of the four studies, but where I exclude the detailed description of some of the diagnoses, e.g., motor disorders, intellectual disability and other diagnoses categorized as neurodevelopmental conditions, due to them not being the specific focus of the studies in this thesis.

Neurodevelopmental conditions (NDCs), sometimes called neurodevelopmental disorders (NDDs), is an umbrella term for different types of conditions that cause social and adaptive impairment (APA, 2013). Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD) are conditions that are included in NDC according to DSM-5 and are the two diagnoses in the central focus of this thesis. The concept of

neurodevelopmental conditions includes various types of conditions that emerge in early childhood and cause persistent impairment in cognitive, social, academic and/or occupational functioning (Bölte, Girdler & Marschik, 2019). NDC is an umbrella term including ASD, ADHD, specific learning disorders and motor disorders (APA, 2013). About 10 to 15 % of schoolchildren are diagnosed with an NDC, with an estimated prevalence of between 3 and 7 % of ADHD (Thomas, Sanders, Doust, Beller & Glasziou, 2015) and 1 to 2 % of autism (Boyle et al., 2011; Centers for Disease Control and Prevention, 2016). However, the prevalence varies considerably. The increase in ADHD and ASD diagnoses is frequently discussed in the literature and the explanations vary, e.g., it is due to greater awareness and knowledge, the use of more robust diagnostic tools and greater expectations from society to manage different activities in life or school (Mahdi, 2019).

NDCs are characterized by cognitive difficulties that significantly affect students' management of daily routines in school (Mahdi et al., 2018). An important cognitive construct are executive difficulties which are often reported in children with NDC (Lukito, Jones, Pickles, Baird, Happé, Charman & Simonoff, 2017), where impairments in working memory and self-regulation are especially associated with ADHD (Kasper, Alderson & Hudec, 2012). *Executive function* impairments are characteristics of both ADHD and autism while *weak central coherence* and difficulties with *theory of mind* are characteristics for autistic students. Weak central coherence refers to a detail-focused processing style with difficulties in processing incoming information and gestalt (global) form as well as with paying more attention to details or parts of objects (Happé & Frith, 2006). Theory of mind is described as an inability to comprehend what beliefs others hold and understanding that other's beliefs can be different from one's own beliefs (Isaksson, Neufeld & Bölte, 2021). Interactions between students involve representations about the other's mental states on several levels, e.g., beliefs, desires, intention and emotions (Bauminger-Zviely, 2013). The ability to mentally depict the thoughts of others, understand feelings and predict behaviors are all necessary skills for the school setting.

Students with NDC have different needs, and the same diagnosis can lead to different educational needs. The diagnosis can have benefits and provide information of what the needs are likely to be. Nevertheless, for teaching and learning, the educational needs of the students and students' experiences are important steps in order to prepare the learning environment adequately. The NDC diagnosis can be seen as a condition with a natural variety in development (Baron-Cohen, 2017; Miranda Ojeda & San-Juan, 2022).

2.3.1 Autism spectrum disorder (ASD)

Autism is defined as a developmental disability significantly affecting verbal and nonverbal communication and social interaction (APA, 2013). The term Autism Spectrum Conditions (ASC) has recently been more frequently used by researchers (Baron-Cohen et al., 2009). In this thesis, I use the terms ASD, ASC, autistic and autism as synonyms. Autism is usually evident before the age of 3 years. Autism is a spectrum disorder with a wide span of diverse strengths and needs. Children and youth with ASD have different communication skills, from

relatively good verbal skills to no spoken language (Pierangelo & Giuliani, 2008). There are many variations in symptoms and behavioral characteristics in ASD. Some or all of the characteristics associated with ASD may be observed in a range from mild to very severe forms. The term high-functioning autism is sometimes used for mild forms, associated with an IQ of above 70. The term autism is now used to refer to all individuals on the autism spectrum (i.e., earlier autism, atypical autism, Asperger syndrome, pervasive developmental disorder not otherwise specified) (APA, 2013, DSM-5). In DSM-5 and ICD-11, ASD is defined by impairments in three behavioral parts, social reciprocity, communication and behavior and interests. An ASD diagnosis implies:

- Qualitative impairments in social interaction
- Qualitative impairments in communication
- Restricted repetitive and stereotyped patterns of behavior

In general education classrooms, the majority of students with ASD have mild or moderate symptoms. More than half of the total sample of students with ASD (57 %) in USA are educated in self-contained classrooms or in special schools (U.S. Department of Education, 2004). ASD is often associated with comorbid conditions, e.g., ADHD, ID, dyslexia and mental health problems like anxiety, depression and sleep disorders (Lai et al., 2014). The prevalence of autism varies between countries and studies. In Sweden, Gillberg, Cererlund, Lamberg and Zeijlon (2016) found prevalence of autism estimated to be 7–11 per 10.000. The prevalence rate of ASD in males is about four times higher than in females (Constantino, 2011). Although there is debate whether males are simply discovered and assessed for diagnostic criteria more often. Furthermore, autistic females have more coping and camouflaging strategies, e.g., managing demands from the social environment (Lundin et al., 2021) and advantages in cognitive flexibility as well as less repetitive behaviors (Bölte, Duketis, Poustka & Holtmann, 2011). Comorbidity in ASD is common, e.g., dyslexia, anxiety, intellectual disability and depression (Mahdi, 2019). The relationship between symptom severity and functioning in life or school is not fully explored (Howlin et al., 2013). Students with ADHD and ASD express less quality of life than their typically developed peers (Jonsson et al., 2017). Children and youth with ASD can have limited adaptive functioning, where the necessary skills for school and further education can be less developed and lead to dropping out of school (Fredriksen et al., 2014).

2.3.2 Attention Deficit/Hyperactivity Disorder (ADHD)

ADHD is a neurodevelopmental condition characterized by inattention and hyperactivity (APA, 2013). Co-morbidity is high, including ASD, intellectual disability, dyslexia and communication disorders (Thapar & Cooper, 2016). ADHD arises in childhood and most individuals will continue to have symptoms up to adulthood (Faraone & Larsson, 2019). Figures of prevalence vary considerably worldwide between 5.3–7.2 % (Thomas, Sanders, Doust, Beller, & Glasziou, 2015). For Sweden, the prevalence among adolescents is 7.7 % (Kosidou, Edwin, Magnusson, & Dalman, 2017). There are multiple genetic variants that are associated with increased risk for ADHD (Faraone & Larsson, 2018). Studies also show the

impact of environmental factors (e.g., prematurity and exposure to toxins) in development of the condition (Thapar & Cooper, 2016). Children and young people with ADHD are at high risk for a wide range of psychiatric outcomes including anxiety and often suffer from impairment in school performance. This can lead to poor health and low quality of life (Svanborg, Thernlund, Gustafsson, Hägglöf, Poole, & Kadesjö, 2009). Current treatments and interventions for individuals with ADHD include pharmacotherapy and behavioral and psychosocial interventions. As mentioned earlier, executive functioning impairments are characteristic for students with ADHD, which in turn make functioning in a school setting more challenging. Executive function is an umbrella term describing processes required for purposeful, goal-directed activity (Hughes, Ensor, Wilson, & Graham, 2010). In this goal-directed activity, several distinct skills are included, e.g., attentional control, cognitive flexibility, self-regulation, working memory, strategic planning, inhibition and impulse control (Xu, Han, Sabbagh, Wang, Ren, & Li, 2013).

Findings indicate that among students with ADHD, teacher–student relationships work less adequately, with more conflicts and less co-operation (Plantin Ewe, 2019), which can lead to school failure, more loneliness or low self-esteem for the student. Plantin Ewe and Aspelin (2021) explored how teachers’ relational competence, according to meeting students with ADHD, was developed through a video-based intervention. The researchers found that the relational competence was developed, and at post-test the teachers used a more nuanced relational language, had a better adopted student perspective as well as improved sensitivity and responsiveness.

2.3.3 Bridges and barriers for children with NDC in mainstream school settings

Educational inclusion should not be treated naively or ideologically, as its implementation comes with multiple challenges. While inclusion philosophy aims at educating all children in mainstream schools (Ainscow et al., 2006), the current trend is to achieve that more children can attend mainstream schools (Florian, 2014b; Norwich et al., 2021), including those with a wide range of diverse needs, such as an NDC. There is a tendency to focus more on procedural skills and behavioral outcomes in non-inclusion settings for students with ASD than on academic skills (Kurth & Mastergeorge, 2010), which is similar to educating students with ADHD in special settings (DuPaul & Weyandt, 2006). Previous studies show that when teaching students with ADHD in small groups, designed only for meeting that particular group, the teaching often consists of reducing disruptive activity and control of behavior (Hjörne, 2011). Preliminary goals seem to be to foster adaptive social behavior or what is considered appropriate in a school setting rather than pedagogical content knowledge and academic performance (Hjörne, 2011; Kos, Richdale, & Hay, 2006). This is also recognized by parents, and when expressing benefits with inclusion, the general education classroom provides students with NDC the opportunity to engage more in academic tasks (Roberts & Simpson, 2016) and to have a better chance at a normal life (Waddington & Reed, 2006). Recent literature, however, demonstrates several obstacles and fewer opportunities for equity

and learning for students in mainstream settings (Stark et al., 2021; Zweers, Tick, Bijstra, & Van De Schoot, 2020). In fact, when children with NDC are enrolled in a mainstream school, parents are concerned with significant cases where it does not work well and where student exclusion or underachievement is the outcome (Andersson, 2020; Roberts & Simpson, 2016). Therefore, while inclusion is a paramount goal in education, without systematic implementation of interventions and sufficient support, the educational inclusion will not fulfill its ambition and philosophy (Pellicano et al., 2018). The inclusive education philosophy guides schools towards a system where all children grow and develop side by side, no matter what prerequisites exist, This philosophy promotes taking care of and celebrating diversity. The paradox is when schools celebrate diverse learners and at the same time are being measured in terms of achievement among students and rankings of standards both internationally and nationally (Hornby, 2015).

Children with moderate and severe disabilities have impairments that need to be addressed from several perspectives. In this case, there is a huge need for a full continuum of services and support. Support from teachers is one of the key strategies for accommodating students with NDC in the mainstream classroom. There is a great body of literature supporting and highlighting the importance of teachers' knowledge, attitudes and awareness in providing excellent education to students with NDC (Roberts & Simpson, 2016; Parsons, Guldberg, MacLeod, Jones, Prunty, & Balfe, 2011). Unfortunately, there are fewer attempts to build up this knowledge. Principals and school management express enough service and knowledge among their staff (Bartonek et al., 2018) and themselves (Roberts & Simpson, 2016). This picture is not shared among general education teachers (Bartonek et al., 2018; Humphrey & Symes, 2013).

A serious problem for educationally included students is that despite attempts of students with NDC achieving educational goals, there are still challenges of academic achievement and participation that are not met in a satisfactory manner (Ashburner, Ziviani, & Roger, 2008). Moreover, as a consequence of the shortage in knowledge among teachers and school staff, students with ASD are more at risk of being excluded from school (Roberts & Simpson, 2016). Parents express that there is a lack of academic accommodations and pedagogical support from teachers in mainstream settings (Tamm et al., 2019; Andersson, 2020). This is in line with the investigation performed by the Swedish School Inspectorate (2012). They found a limited amount of sufficient support for students with NDC, and the support was seldom evaluated or adapted to the individual's needs. With inappropriate support and inclusion, it is not questionable that many parents search for and prefer specialized placements for their children (Barnard, Prior, & Potter, 2000; Kurth & Mastergeorge, 2010; Linton, 2015). The public school system is required to provide educational services for students with ASD and ADHD, but are often unequipped for this mission. Growing numbers of students with ASD now attend mainstream schools and increasing numbers of teacher assistants or paraprofessionals are being employed to support them (Symes & Humphrey, 2011). A risk factor with this support is that students receive less attention from the class teacher and are being further isolated from their peers. Furthermore, there are issues with the

competence of and the relationship with the class teachers. Many teacher assistants and paraprofessionals have no formal training of ASD or other students' needs (Lindqvist, Östergren, & Holme, 2020; Symes & Humphrey, 2011).

Inclusion of students with ASD to increase participation, presence and achievement is not trivial and requires extensive knowledge and sensitivity by all staff that meet and teach the student. Symes and Humphrey (2011) examined factors in inclusive settings that facilitated or hindered teaching assistants in effectively supporting students with ASD. Prerequisites for success were access to expertise and teacher awareness of ASD. The expertise would preferably be in-house to provide opportunities for this expertise to be shared. Teacher assistants found it particularly challenging to support a child if the given teacher did not help to create an inclusive atmosphere. Lack of teacher awareness of ASD was difficult in many ways, ranging from teachers not understanding or addressing the needs of the learner to not being able to adjust the work or tasks. Lack of teacher awareness and ability to include students with ASD may lead to social exclusion or students being completely assigned to their teacher assistants and with activities that are significantly different from that of their classmates (Schwab, Sharma, & Loreman, 2018). Other important components for inclusive education and cooperation found by Symes and Humphrey (2011) were positive attitudes towards students with special educational needs, school leadership support for inclusion, collaboration and respect. To conclude, teacher assistants/paraprofessionals can facilitate inclusion under optimal circumstances and hinder inclusion under less advantageous conditions. A shared vision for the change in school must include several professions, otherwise those shared values and principles will not come alive (Booth & Ainscow, 2002). The whole-school inclusive culture requires all staff to have an understanding of the expectation of inclusion within their school (Symes & Humphrey, 2011).

Social skills difficulties and communication limitations are major concerns for students with ASD in school (Falkmer, 2013; Hebron & Humphrey, 2014; Linton, 2015). Students with more advanced language skills can still have difficulties with abstraction, imagination and pragmatic language. The limited ability to have a back-and-forth conversation or only paying attention to certain areas of interest are particularly challenging in mainstream settings (Pierangelo & Giuliani, 2008). There are several activities during the school day that consist of interaction with peers and social gatherings. Social skills that children can typically learn by watching others or through imitation may need to be explicitly taught to students with ASD and ADHD. All these social challenges affect school functioning to a high degree. Studies have shown that students with autism have an increased risk of low participation and exclusion in school (Ashburner et al., 2010). The limitation of participation could lead to more barriers and social exclusion (Linton, 2015). Students with autism experience the social arena and social interactions as particularly stressful (Roberts & Simpson, 2016). Bullying and teasing are major concerns for students with autism (Barnard, Prior, & Potter, 2000; Humphrey & Symes; Williams, Gleeson, & Jones, 2018) and ADHD (Holmberg & Bölte 2008), elevating the risk for psychiatric issues such as anxiety and depression (Hebron &

Humphrey, 2014). Social skills training is often neglected by schools (Barnard et al., 2000) and autism awareness is low (Pellicano, Dinsmore, & Charman, 2014).

Problematic absenteeism is a problem of inclusion failure. An increasing number of students with ASD drop out of school (Parson & Lewis, 2010), which is also seen in the Swedish context (School Inspectorate, 2012). This is similar in ADHD, where adolescents with ADHD are eight times more likely than adolescents without ADHD to drop out of high school (Kent et al., 2011). Students who have good mental health, high self-esteem and positive academic experiences are less absent during the academic year (Kent et al., 2011). Adolescence can be a particularly difficult developmental period for students with NDC (Jacobson, Williford, & Pianta, 2011). Students with NDC often exhibit a specific deficit in the academic setting, and since school is more complex and demanding over the years and grades, there is an urgent need for interventions for adolescents with NDC in school settings.

Executive functioning skills play an important role in students' cognitive functioning in school. Students with weaker executive functioning skills have more behavioral problems and less regulatory control, which affects academic achievement (Jacobson et al., 2011).

Transitions from elementary school to middle/high school are particularly challenging since the change is both physical from one school building to another as well as psychosocial, e.g., increases in number of teachers, class size, expectations and decreases in perceived teacher support (Hughes et al., 2010). The expectancy of more independence is an issue, and in a mainstream setting, there might even be more expectations of students' autonomy and working skills and motivation. Traditional instructional strategies such as complex verbal instructions and demonstrations may be distracters rather than focus of attention for students with NDC. Integrating multiple items of information or managing to know where and how to begin with a task is another challenging situation in mainstream schools (Hume, Plavnick, & Odom, 2012). Executive function impairments have been addressed by school-based interventions, e.g., the Challenging Horizons Program (Evans, Langberg, Schultz, Vaughn, Altaye, Marshall, & Zoromski, 2016) for adolescents and Individual Work Systems (Hume et al., 2012) for younger students. However, medical treatment is still the most common treatment, even though no evidence for better academic achievement is found (Young & Amarasinghe, 2010). Another approach to meet complex needs among students are special settings with additional support and resources.

Further challenges in mainstream settings are sensory hyper- and hypo-processing of information. Students might be very sensitive to sounds, textiles, tastes or smells (Leader, Tuohy, Chen, Mannion, & Gilroy, 2020), or with food selectivity. In the school area, there are many locations that can cause stressful situations, such as the cantina, school yard or gymnasium. As a large number of students with autism experience difficulties in sensory processing (Volkmar, Paul, Klin, & Cohen, 2005), the classroom and other facilities in school can therefore be problematic. The overload of stimuli in several contexts and the inability to filter background noise or hypersensitivity to certain sounds will make the mainstream environment hard and tiring. There are barriers in the psychosocial, the

pedagogical/didactical and the physical environment that need consideration and preparation for students with NDC in inclusive settings (Tufvesson & Tufvesson, 2009).

2.4 INTERVENTIONS—EVIDENCE-BASED PRACTICE FOR SUPPORT IN THE CLASSROOM

This section provides an overview of research-based support and educational strategies for students with NDC in order to provide learning occasions. There is a variety of evidence-based interventions to choose from when implementing classroom-based strategies for students with NDC. Despite the rigorous research base, teachers and other personnel have difficulties in implementing evidence-based methods in schools (Parsons et al., 2011), where examining the practice and how it is done seem urgent. There are interventions and accommodations designed to remove barriers to learning. Internationally, the terms accommodations and interventions are used in practice and are implemented as support. In order to provide a clear definition and look at the differences among the two concepts, Harrison, Bunford, Evans and Owens (2013) explain accommodations as primarily focusing on the environment and interventions as targeting improvement in the competence of the students. In Sweden, the tradition of supporting children and youth with NDC in mainstream settings mainly focuses on accommodations. In a large RCT, Harrison et al. (2020) compared the effects of interventions and accommodations for students with ADHD and found better academic engagement and advantages in independent work for the intervention group. There are school-related difficulties and challenges associated with NDC, and to build up capacity and inclusiveness, there is a need for a broad repertoire of either accommodations or interventions or both. To support students with NDC in mainstream settings, the support should completely depend on the individual needs of the child and youth. In this research project, several of the approaches below were represented among the preparations for the learning environment presented for teachers in study II, the neurodevelopmental conditions awareness intervention.

2.4.1 Interventions for students with neurodevelopmental conditions

Children and youth with NDC are a heterogeneous group (Baron-Cohen, 2017). Therefore, it is unlikely that one approach or model will support and work out for the diversity of and different needs among students. There has been considerable research regarding the effectiveness of early interventions for young children (National Research Council, 2001). There are strong opinions regarding what is most appropriate, effective and the right approach (Pierangelo & Giuliani, 2008). Each system has its own tradition and philosophies regarding supporting children with disabilities. Systematic literature reviews and high-quality research can provide guidelines for educators. There are several themes for support and interventions in school inclusion and details in day-to-day practice and the classroom environment, e.g., differentiating the curriculum, specific interventions, adjustments of assessments and environmental accommodations. Furthermore, beyond practical classroom practice, impact on inclusion has also many other factors, such as management and leadership, school organization, school culture, staff development and cooperation with

specialist organizations that support health and well-being. With the holistic approach, there are several factors to consider when planning for change and improvements for groups of learners. Using accurate data and evidence-based practices effectively to help identify and support students who are underachieving is significant to improve achievement for all.

There is a rich body of intervention research from pre-school to college for students with NDC, with the majority linked to ASD and fewer studies on ADHD. Currently, the most common intervention strategy with children with ADHD is psychostimulant medication (Trout et al., 2007). There are established guidelines and interventions for ASD and ADHD as independent conditions. Understanding and interventions for co-existing ASD and ADHD are less established (Young & Amor, 2020). The increased diagnosis rates of ASD are seen as the main reason as to why intervention science is now providing evidence about which practices are effective (Wong et al., 2014). Most studies cover early interventions, which is from a young age until about 10 to 12 years of age. This transition from grade 6 to 7 is critical (Gindi, 2020), and after the age of 12, there are fewer students in inclusive settings. There is a lack of research body for adolescents (Kurth & Mastergeorge, 2010; Wong et al., 2014). This is problematic because demands and curriculum become more abstract and inferential in middle and high school. Adolescents are also expected to work more independently and demonstrate organizational skills (Mastropieri & Scruggs, 2001). Furthermore, many interventions take place in clinical settings, special schools or self-contained settings (Trout, Lienemann, Reid, & Epstein, 2007), which might not lead to generalization. Wong et al. (2014) have identified and classified interventions into two main areas, *comprehensive treatment models* and *focused intervention practices*. Comprehensive treatment models are practices designed to achieve a broad learning and developmental impact on core deficits of ASD, while focused intervention practices are designed to address a single skill or goal of a student with ASD. Comprehensive treatment models are often based on evidence-based practice, EBP. However, the whole program or approach is seldom measured and evaluated. Focused interventions, on the other hand, are often measured and operationally defined with learning outcomes. In the USA there are about 30 different programs for students with autism (Odom, Boyd, Hall, & Hume, 2010), while in Sweden there are none, as far as the author has been able to discern. The criteria for qualification as an evidence-based practice set by Wong et al. (2014, p. 15) is:

- at least two high-quality experimental or quasi-experimental group designs conducted by at least two different researchers or research groups, or
- at least five high-quality single case designs conducted by at least three different researchers or research groups having a total of at least 20 participants across studies or a combination of at least one high-quality experimental, or
- a quasi-experimental design and at least three high-quality single case designs conducted by at least two different research groups.

These qualification criteria are similar as in *What Works Clearinghouse* (WWC).

2.4.2 Behavioral Approaches

Many evidence-based practices apply behavior analysis techniques to address a specific behavioral problem or goal for the participant. Applied Behavior Analysis (ABA) is a systematic approach aiming to increase desired behaviors and decrease undesired behaviors. ABA is grounded in learning theory and in that behavior is influenced by environmental events (Pierangelo & Giuliani, 2008). ABA has empirical support for its effectiveness for addressing several areas affected by ASD (National Research Council, 2001). Reinforcement is used to teach new skills and to increase desired behavior. The reinforcement can be both positive and negative. Positive reinforcement is something that the student gains access to after performing the right skill or behavior. Negative reinforcement is relief of some kind, e.g., taking a break or removal of an object or activity (Wong et al., 2014). Prompting is defined as a physical or verbal cue that is used to help the student pay attention to the task. Prompting may include hand-over-hand, gestural prompts, e.g., calling the student's name or giving reminders (Hume et al., 2012). Typical teacher instructions or modeling is not categorized as prompting. Pivotal response training is to teach central behaviors needed for daily life at home or in school. The training includes, for example, motivation training, self-initiation, empathy, responsiveness to multiple cues and social interaction (Pierangelo & Giuliani, 2012). Time Delay is a practice used to gradually fade the use of prompts during instructional activity (Wong et al., 2014). There is a brief delay between the instruction and the prompt. The delay is used in conjunction with a prompting procedure, and when the learner becomes more proficient at using the new skill, prompting is used less. Cognitive behavioral intervention is based on the belief that behavior is mediated by cognitive processes (Wong et al., 2014). The intervention includes directions and learning of how to examine and regulate thoughts and emotions. This intervention is used for learners who have difficulties in handling feelings, e.g., anxiety or anger.

2.4.3 Skills-Based Interventions

There is a great body of research of social skills training (Jonsson et al., 2019; Watkins et al., 2019). Social skills are especially important in school settings, where students are involved in several social interactions during the school day. Social skills are described as a process where an individual interacts with the environment and knows which tools to use to initiate and maintain interpersonal relations (Afsharnejad et al., 2022). Looking at that definition, social skills interventions should address the individual and the environment. At present, the focus is mainly on the individual and skills training. Early interventions are crucial in order for the learner to have fewer difficulties when reaching adolescence and adulthood. There is a variety of social skills training and interventions used to enhance social skills. Individual needs can be approached from several entry points, where individual social skills training is one and accommodations and adjustments in the surrounding environment is another. Social skills training involves group or individual instruction designed to teach learners how to interact and communicate with peers (Wong et al., 2014). The training or intervention can be designed differently, but most programs include instruction on basic concepts, role-playing, feedback and play. Wong et al. (2014) identified six specific beneficial skills interventions in

their meta-analysis and review of evidence-based practices. These six approaches are social narratives/stories, peer-mediated interventions, video-modeling, prompting, social skills training and self-management. Self-management focuses on identifying appropriate and inappropriate behaviors and the intervention strengthens the individual's ability to monitor, evaluate and effectively regulate their own behaviors across contexts and settings (Bellini, Garder, & Markoff, 2014). Social skills group training has demonstrated both effects and participants' satisfaction (Afsharnejad et al., 2022; Jonsson et al., 2017), where long-term training is seen as most beneficial (Jonsson et al., 2019).

Individual work systems are a central component of structured teaching developed by TEACCH and can be considered as a single intervention (Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). In general education settings, there are expectations of student's self-management and an intervention designed to address that challenge among students with NDC is the individual work system. It is a visual step-by-step guide for the students with four steps, including (1) the task the student is supposed to do, (2) how much work there is to be completed, (3) how the student knows they are finished and (4) what to do when they are finished (Hume, Plavnick, & Odom, 2012). Social narratives are interventions describing social situations in detail and aim to help learners understand the cues of social situations and develop social skills or behaviors (Wong et al., 2014). One of the most well-known methods is social stories, a strategy developed by Carol Gray (ibid.). Discrete trial teaching is another skills-based intervention. The aim is to teach skills in a planned, controlled and systematic manner (Wong et al., 2014).

Video-modeling is another model of enacting desired behavior. The appropriate behavior is recorded and shown to the student. The recordings are videos of adults, peers or the students themselves performing an identified skill or task. The student will watch and imitate the behavior. The student is provided opportunities to practice the skill. According to Ayers and Langone (2005), video-modeling is a promising tool for teaching social and functional skills for students with ASD. Psychoeducation is helpful for improving the experience for students with ADHD and ASD (Young et al., 2020). Psychoeducation is delivered in various formats. The content and form may preferably differ between the target groups, e.g., children or adolescents. The aim of psychoeducation is to provide information about the condition. PEGASUS groups are cognitive behavior therapy-based psychoeducational groups for individuals with ADHD (Hirvikoski, Waaler, Lindström, Bölte, & Jokinen, 2015) and for individuals with ASD (Gordon, Murin, Baykaner, Roughan, Livermore-Hardy, Skuse, & Mandy, 2015).

2.4.4 Environmental interventions

Computer-assisted technology has become particularly useful for students with autism and related disabilities to promote social and academic skills and independence. Technology has become an integral part of everyday life inside and outside school and is therefore a promising environmental accommodation. Assistive technology is any item, piece of equipment or product system that is used to increase, maintain or improve the functional

capabilities of the student (IDEA, 1988, p. 136). Technology has long been known to improve students' experience in several domains of the school environment. Technology, such as communication devices, can have a great impact on the quality of life for students with ASD (Gillespie, Best, & O'Neill, 2012). Furthermore, iPads and smartphones with applications that can facilitate autonomy, e.g., calendars or schedules, can help the individual to manage and prepare for the school setting and activities. There are also software programs and applications aiming to assist in daily organization of routines, prompts for activities and task completion (Gillespie et al., 2012).

Visual support and visual schedules are concrete cues that provide information about an activity, routine, expectation or support skill demonstration (Wong et al., 2014). The support can provide support in many areas and activities in the school setting. Visual support is commonly used to organize the learning environment and provide cues and reminders to the child, which enhances autonomy. Peer-mediated interventions is a method where typically developed peers are trained and/or involved in an intervention. Peer-mediated instruction and interventions are used to teach typically developing peers how to interact and help learners with ASD behavior, communication or social skills (Wong et al., 2014). Structured play groups are interventions using small groups to teach a broad range of skills (Wong et al., 2014). Structured play groups include an activity and typically developed peers. The skill is developed in collaboration with peers and instructions, prompting and scaffolding by teachers. With a learner-centered approach, the discussion is about how to meet not only the academic but also the physical, social and emotional needs of learners.

Traditionally, the biomedical approach to understand and develop interventions for children with NDC has been dominant in early-trained teachers, where the student has a disability and has to adopt and adjust to the school and the environment. However, there is a tendency to view the environment as increasingly important (Linton, 2015). Recently, awareness has been growing in regards to how neurodevelopmental conditions impact and are largely influenced and related to the environment (Parsons et al., 2011). The Department for Children, Schools and Families in the UK was a pioneer when publishing *Designing for Disabled Children and Children with Special Educational Needs* (2009). The publication brought awareness about the importance of the classroom and the whole school design. Internationally there are several attempts in creating more inclusive learning environments for children with needs. The National Research Council (2001) in the US identified ten different programs, e.g., the UCLA Early Intensive Behavioral Interventions, the treatment and education of autistic and related communication handicapped children—TEACCH, the NEST and HORIZON ASD-specialized programs developed for strengthening academic and social skills and serving students in different types of classes, the learning experiences and alternate program for preschoolers and their parents—the LEAP model and the Denver model. In a follow-up, Odom, Boyd, Hall and Hume (2010) identified 30 comprehensive treatment models within the US. In several of the programs and models, there are components of focused intervention practices, e.g., in the LEAP model there are peer-mediated instructions and intervention (Wong et al., 2014).

In Sweden, there is no tradition of comprehension treatment models for students in mainstream schools or focused intervention treatments. Reasons for this might be the fear of marginalizing or resistance towards training of individual skills. There is also a lack of statistics over students with disabilities and in need of more support (SOU, 2021:30), and how effective different kinds of support is as well as how it is implemented. Instead, schools are working with analyzing the learning environment in two steps. First, analysis of the educational, psychosocial and physical environment (SPSM, 2018), and second, analysis of where support is needed on three levels, the organization, the class/group and the individual, and after evaluation if support is not sufficient, an individual educational plan (IEP) is formatted. This approach has not been sufficient (SOU, 2021:30), and there is clearly much progress to be made in Swedish school settings.

2.4.5 Teacher training for inclusion of students with NDC

Teacher training is a form of environmental intervention. If values from the philosophy of inclusive education are supposed to create real change, the general teacher needs more knowledge of SEND students. In an inclusive classroom, the teachers have the knowledge and tools to teach all children. It is a quest for democracy because the access to special needs teachers and coordinators is not equivalent in and around schools (Magnússon, 2020). Professional guidance from special needs teachers and coordinators are one way to address inclusion, while more professional development targeting all personnel and general teachers is another. The next section discusses teacher training for enhanced inclusion. Furthermore, there are aspects of whether specialist expert knowledge for special needs teachers is the recommendation or if overall broad special education knowledge among all teachers is possible.

Many educational systems have been reorganized, with less centralization and a greater responsibility at the school level and for the individual teachers (Forlin, 2001). This has resulted in intensified expectations for teachers and greater personal involvement in overall school improvement (Fullan & Hargreaves, 1991). In addition, the education system has become overrun with new initiatives and latest pedagogical strategies and trends (Ekins & Grimes, 2009). Teachers are supposed to cater to children with disabilities in their classrooms and with that follows a need of a great deal of professional capital (Hargreaves & Fullan, 2013). More student diversity in the classroom places considerable demands on teachers. There have been fewer radical changes to teacher preparation and professional development to facilitate this (Forlin, 2010). Teaching is technically difficult, and to know and recognize signs of different needs and conditions, e.g., neurodevelopmental conditions, language impairment or learning difficulties, requires theoretical and technical knowledge. Providing a high-quality learning environment with development for all students means knowing how to differentiate instructions and provide support at certain levels in the environment, i.e., the educational, the psychosocial and the physical area.

There is a growing body of research that recognizes the lack of enough training to prepare teachers to meet the needs of all students and a wide range of SEND (Alexander et al., 2015;

Bartonek et al., 2018; Hornby, 2015; Ofsted, 2008). Many teachers and paraeducators working with autistic students do not have adequate training in evidence-based methods to teach and meet the needs of these children (Alexander, Ayres, & Smith, 2015; Kurth & Mastergeorge, 2010; Odom et al., 2013). A recent large-scale study among different school professionals in Sweden (N = 4778) shows an alarming picture of how well prepared the staff feels when it comes to teach children with neurodevelopmental conditions (Bartonek et al., 2018). Only 14 % of the staff reported that they had received formal education within this area, only 18 % applied special individual support and as little as 6 % felt they could teach children with NDC adequately (Pellicano et al., 2018). School policy and organization have to deal with not only this lack of general competence but also with neurodevelopmental conditions having a diversified nature and students with NDC having varied needs and characteristics, so the extensive knowledge shortage is a threat to inclusion. A major constraint is to handle the neurodiversity properly and go beyond “one model fits all” (Baron-Cohen, 2017). Support in the environment and interventions have to be especially designed to meet the unique needs of the student.

Training teachers for autism and other neurodevelopmental conditions has shown effectiveness (Petersson-Bloom, 2020). In a large study, Sam et al. (2020) examined the efficacy of a comprehensive program for autistic students and found significantly higher total attainment of educational goals compared with service as usual. The intervention had a holistic approach and was delivered by teachers and paraprofessionals. There were gains from pre- to post-measures in teacher EBP fidelity, use and confidence. Arthur-Kelly, Sutherland, Lyons, Macfarlane and Foreman (2013) analyzed attempts to enhance pre-service teacher education to support inclusion. They found it significant to not only enhance teacher students’ knowledge of how to plan, implement and evaluate learning programs, but also to further develop and focus on beliefs and attitudes. Knowing theoretically about instructional strategies needs to be combined with practicum experiences (Arthur-Kelly et al., 2013). However, this goal is challenging to achieve in preparation of pre-service teachers. Based on past literature, the prevailing policies on educational preparedness of educators in serving children with educational needs, e.g., autism and ADHD, appear to be constrained by several limitations.

2.4.6 Professional development for general teachers versus special educators

Training teachers to become good inclusive practitioners requires opportunities where teachers can reflect, discuss and collaborate with colleagues and experts. The leadership and management in school can take a transformational approach, where the staff is collectively responsible for and active in school development. Leadership and the school culture are important factors for school improvement (Dyson, Gallannaugh, & Millward, 2003). Progress, according to Booth and Ainscow (2002), can be made through school leadership and management that is ideologically in tune with inclusion and the inclusive practice as a core principle.

Furthermore, in inclusive practices, the whole staff should subscribe to a set of values that are the keys to inclusion. Such values include reducing barriers to learning and participation for all students, increasing the capacity of the school to respond to the diversity of students and putting the inclusive values into action in education (Ainscow et al., 2006). An important adjunct is staff who are convinced all students belong and can be educated in mainstream schools. With the broad inclusive education perspective, the support, special didactics and special education cannot completely take part in segregated settings (even within the school). Special needs teachers and coordinators need to work closely together with the regular classroom teachers, so the learning environment is properly prepared. Special needs teachers and coordinators have an umbrella responsibility: ensuring the day-to-day provision for students with special education needs alongside providing guidance and deploying staff with support (Symes & Humphrey, 2011). In this responsibility, special needs teachers and coordinators shall evaluate the efficacy of resources and make long-term plans for special needs provision.

Ashman (2010) highlights the problem with professional learning for in-service teachers. Teachers who enroll at university are generally more extrinsically motivated and eager to apply new knowledge directly in their classrooms. The bottom-up perspective is a motor for further learning. The bottom-up perspective is seen as the most promising approach when it comes to adults' learning (Dudley, 2013). However, if seriously intending to improve inclusion, education courses and programs need to reach all teachers and not only those who already have the intention to improve learning for all students. Furthermore, Ainscow (2003) argues that professional development and teachers' learning needs to be context-specific and directly linked to their practice. To improve the school culture, professional development has to be facilitated by those who strongly believe in inclusive education and can implement and spread the vision. "The whole school approach" is another major trajectory for inclusion. Professional development should be provided for all staff, especially for general teachers if the inclusive classroom is to be truly inclusive. Ensuring that teachers are provided with high-quality professional development is crucial in improving educational inclusion.

2.5 THEORETICAL FRAMEWORK

See Figure 2 for an overview of the theoretical stances of this thesis. The thesis takes its point of departure from Bronfenbrenner's Bio-Ecological Model. This thesis is driven by the problem of interest, which is how inclusion works in practice. However, all layers of society, from micro to macro, are significant in understanding and creating knowledge. The layers in this model, the social systems theory, are grounded on theoretical stances and standpoints. I have applied Bronfenbrenner's model to examine factors that support or hinder inclusive education for students with NDC. Students' development is influenced by the interactions on the classroom level, where their personal characteristics, wider environmental influences and time all affect the outcomes. The focus on the studies in the thesis are mainly in the practical perspective, the micro- and meso-level of the system. However, the macro-, exo- and chrono-systems influence decisions about access to educational inclusion and how it is supposed to

be organized for individual students and is hence used for interpretation of results. Special educational needs are part of the natural diversity in the classroom, and for developing quality, all aspects are important in understanding the diversity, such as the individual, the learning environment, the home, the wider community and time. In all studies, understanding educational inclusion and neurodiversity is seen as socially situated and influenced by the convergence of multiple social and individual factors. The theory by Bronfenbrenner can explain why relationships among social structures affect individuals and is used for understanding how inclusive education is formed and organized for students with NDC. Students with NDC have different personal characteristics (Baron-Cohen, 2017) and react differently to the same environment and special didactics provided for their needs.

Furthermore, for synthesizing and understanding the evidence, The International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) has been used as a structural framework together with a model derived from the Human Environment Interaction Model (HEI) (Küller, 1991) used for categorization of the learning environment. Figure 2 presents the theoretical framework and their connections as used in the interpretation process.

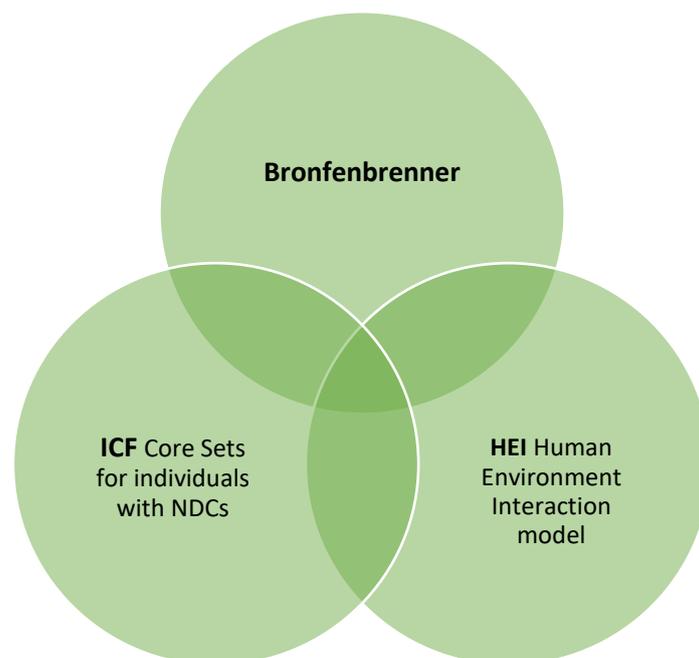


Figure 2. Venn diagram of the theoretical framework of the thesis.

2.5.1 Bronfenbrenner's Bio-ecological Model

Social theory can provide an interpretive lens for understanding complex issues in the society. Bronfenbrenner's bio-ecological model describes a system with multiple environments that surround an individual and creates an interpretative lens for examining inclusive education for schoolchildren. According to Bronfenbrenner (1994), the ecological systems theory explains how different aspects of the environment may influence the development of an individual. The development of an individual includes both its objective properties and the way the individual subjectively experiences these properties. The

environment can be divided into different levels of systems: micro-system, meso-system, exo-system, macro-system and chrono-system. The model places the student with NDC experiencing inclusive education at the center of several distinct environments, with reciprocal interactions with the factors in all levels. The factors from all levels affect the growth and development of the individual, in this case students with NDC, e.g., procedures and interventions in school, direct influence, and policies and laws, indirect influence. Human development is shaped through the process and reciprocal interactions between an individual and the immediate environment (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000). The bio-ecological model is used to better understand how the students are linked to the school environment and how effects from all systems can influence the development and outcome for students with disabilities.

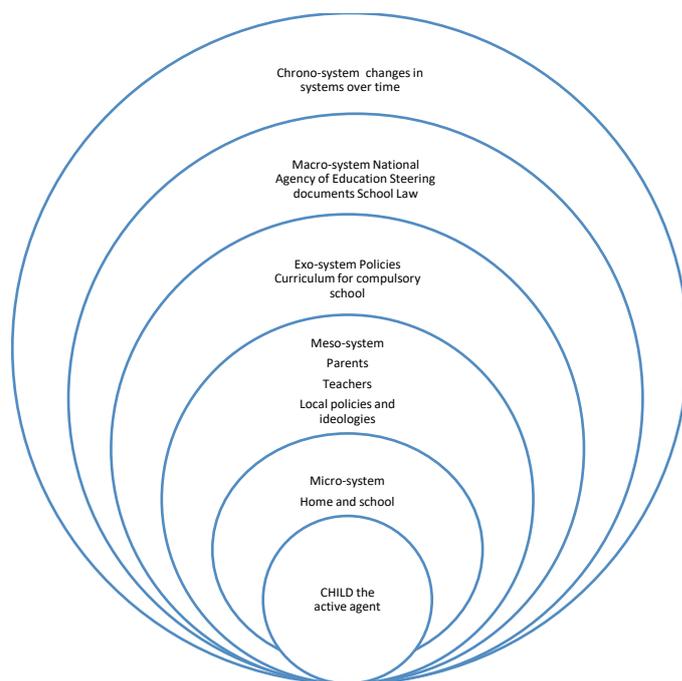


Figure 3. Bronfenbrenner’s Ecological Systems Theory (Bronfenbrenner, 2005).

Evaluation of inclusive education cannot ignore the level of process and practice in the educational system. It is necessary to involve various levels of evaluation in order to broadly understand the phenomenon and what affects the reality for students with special needs. This study takes its point of departure from Bronfenbrenner’s bio-ecological model where the child or youth is viewed through the complex layers of the environment (Bronfenbrenner, 2005), as illustrated in Fig. 3. Bronfenbrenner’s model holds a key proposition: in order to develop optimally, the child requires active participation in progressively more complex interactions with individuals, objects and symbols in the learning environment. This interaction with the environment occurs on a regular basis and over time, and the child develops. The development is dependent on the environment; however, the child is not a passive recipient but takes an active role in their own experiences and development (Bronfenbrenner, 1979). The development of students with NDC is not linear, and there are

different patterns of development over time. As students age, their needs will change and the school situation can be even more complex.

Bronfenbrenner's bio-ecological model is a multi-layered approach that is constructed into systems; the first layer is the center, where the child is at the center and an active agent, with personality traits, temperaments, motivations and genetic inheritance (Bronfenbrenner, 2005). The second layer is the micro-level that involves family but also individuals from school. The third layer, the meso-level, involves schools and contexts in which they operate, and it consists of social structures, events and processes which indirectly affect the student, e.g., teacher education and professional development for teachers. The fourth level, the exo-level, is the neighborhood, the contextual factors that also affect the child, e.g., the availability of physical surroundings or policy documents that impact the curriculum content. The fifth layer, the macro-level, refers to larger and more abstract influences on the child's opportunities to develop, such as values and attitudes and the art of the political and legal educational system. Finally, the chrono-level changes over time and refers to the time and historical period in which the child lives and develops (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006). Measurements and analysis of inclusive education in this paper has its focus on the micro- and meso-levels, and thus for interpretation all levels from the model are used.

2.5.1.1 The micro-system: home and school

The bio-ecological model incorporates both temporal concerns and biological components (Bronfenbrenner & Ceci, 1994). In this model, the child is in the center, and according to Bronfenbrenner and Morris (2006), is the active agent and interacts with the immediate environment. Students' most immediate environment is the home and the school setting, and in this context, in the students' microenvironment, relations are shaped and fostered, and the more encouraging and nurturing these relationships and places are, the better the development of a healthy life (Bronfenbrenner & Morris 2006). These phenomena, the nature of individual school and home micro-systems, are important in understanding and exploring interactions between the child and the environment. Bronfenbrenner (1979) describes the micro-system as a pattern of activities, social roles and interpersonal relations. The meso-system is described by Bronfenbrenner (1979, p. 25) as a system that comprises the interrelations among two or more settings in which the developing person actively participates, such as school, peer group or family, and acknowledging their impact on the individual. There are strengths and limitations to the theory by Bronfenbrenner, where one key strength with using the systems to access education issues is the focus on transition difficulties across contexts. A students' initial transition from home to school or moving from primary to post-primary school are dependent on whether the child or youth enters the setting in the company of one or more persons with whom he or she has participated in prior settings or alone (Bronfenbrenner, 1979). According to Bronfenbrenner (1979, p. 288), the developmental effects of a transition to another context are a function of the match between the developmental trajectory generated in the old setting and the balance between challenge and support in the new setting.

2.5.2 The ICF Framework

The ICF Framework can offer opportunities to interdisciplinary approaches and a broad understanding of an individual's functioning and their participation in the society. The explicit focus in using the ICF Framework in this context is to explore and understand inclusive education through the lens of children with NDC. The framework is used in study I and moreover as tool for understanding how contextual factors in the learning environment affect the development and functioning of the child. The biopsychosocial model is useful in this project due to its integration of both medical and social aspects of disability. Disability is a complex phenomenon and involves an interaction of the features of the individual and the features of the overall context, here the school setting. The World Health Organization (WHO) has developed tools and systems for classifying symptom complaints, disorders, diseases and external causes of injuries (Mahdi, 2019), e.g., the International Statistical Classification of Diseases (ICD). The ICD has undergone revisions, and the critique of missing out on the human experience of having a health condition resulted in applying a universal taxonomy to assess the impact of diseases, injuries or disorders on individual functioning, the International Classification of Impairments, Disabilities and Handicaps (ICIDH) (WHO, 1980). The ICIDH was further revised in meeting the desires of users, and in 2001, WHO adopted a new classification system, the International Classification of Functioning, Disability and Health (ICF) (WHO, 2001).

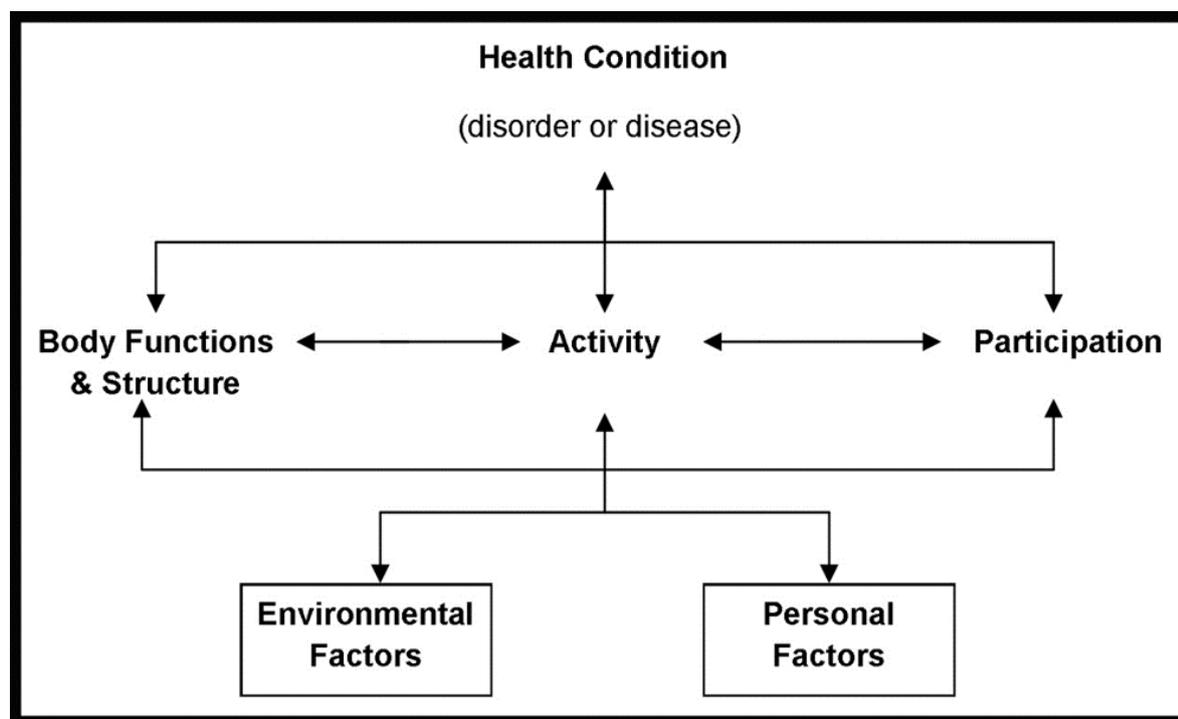


Figure 4. The ICF framework of Functioning, Disability and Health (WHO, 2001).

The ICF classifies functioning and disability according to a biopsychosocial model, where the outcome for an individual is based on a reciprocal process between the health condition of the individual and contextual factors. Health and well-being are affected by functioning and disability as well as contextual factors (WHO, 2001). Contextual factors are environmental

factors and personal factors, such as the quality of the learning environment and the support given, attitudes, social norms and activities in school that affect levels of participation and how well inclusion is working in reality. The ICF framework is not a framework explicitly for inclusion or an inclusion act, however the assessment of ability and disability in NDCs can support educators when providing learning environments for all.

There are developed core sets for individuals with ADHD (Bölte et al., 2018; Mahdi et al., 2018) and autism (Bölte et al., 2019; Mahdi et al., 2019). The ICF Core Sets provide and support stakeholders and educators with an assessment tool for classification of and evaluating the functioning for individuals with NDC (Bölte et al., 2018, 2019). The classification system is built on a biopsychosocial framework where the individual and the environment are equally important in understanding health-related functioning. The biopsychosocial perspective has received recognition worldwide in health-related functioning due to adaptation by WHO (Mahdi, 2019). The ICF classification system can serve multiple purposes. An advantage is that all aspects of an individual's life are covered (Mahdi, 2019). However, the broad and complex system can be a challenge when implementing ICF in practice. To address the challenge and enhance facilitation, the shorter developed versions of ICF Core Sets with specific focus, i.e., ADHD and autism, can support implementation in practice (Bölte et al., 2018, 2019). The ICF Core Sets is an internationally standardized functional assessment of ADHD and autism across lifespan and settings (e.g., educational, administrative, clinical and research settings) (Bölte et al., 2018, 2019).

The ICF model has two levels of categories, environmental factors and personal factors. I use both perspectives, but with a greater focus on the environmental perspective and the environmental factors as used in study I for the categorization of the accommodations. The environmental factors were further aligned with the categorization of the domains from the Human Environment Interaction Model, presented below. The ICF framework has been used to evaluate individualized education programs for students with ASD, where the interventions mainly focused on individual performances with a lack of perspectives on environmental influences (Castro, Pinto, & Simeonsson, 2014). The next theoretical model, the human environment interaction model (HEI) can be a supplemental tool for schools when evaluating the school environment more holistically. The HEI model is less complex than the ICF Core Sets and can therefore provide school professionals with a useful instrument.

2.5.3 The Human Environment Interaction Model

The Human Environment Interaction Model (HEI) is originally developed by Küller (1991), and further adjusted for Swedish school settings by Tufvesson and Tufvesson (2007, 2009). The model is an interaction model with a set of principles modified and linked to neuropsychological operations where different factors interrelate and influence learning. Through application of the HEI model to the learning environment, we can analyze environmental factors and their influence for the individual (Tufvesson & Tufvesson, 2009).

The accessibility model used by the Swedish National Agency for special needs education and schools (SPSM, 2012) is derived from the Human Environment Interaction model by Küller (1991). The model was used in this thesis as understanding of components and artifacts linked to each of the three domains of the environment, the pedagogical area, the physical area and the psychosocial area. The pedagogical area is the art of teaching and the content is materials, tasks, activities for learning, the physical area is rooms, facilities, sound and acoustics and the psychosocial area is the social environment, interactions among students and relationships between students and teachers as well as the atmosphere and how students treat each other. The model is presented in Figure 5, where Social miljö = social environment, Fysisk miljö = physical environment, Pedagogisk miljö = pedagogical environment, Samspel = interplay, Utveckling = development and Förutsättningar för lärande = prerequisites for learning. All aspects of the learning environment affect the child, and interplay is a prerequisite for learning and educational inclusion.

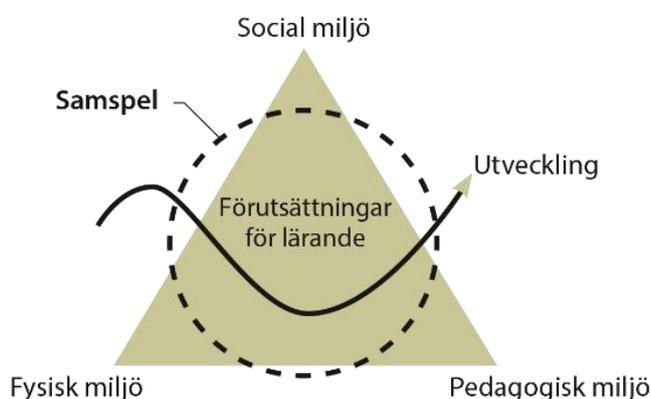


Figure 5. The accessibility model by SPSM, 2012.

In order to understand the interaction between the child and the surroundings, the HEI model was used in this research. The model was used to understand and categorize the accommodations in the literature review (study I), the teachers' adjustments in the intervention study (study II) and in sorting the items from the INCLUSIO instrument (study IV) into different areas of the learning environment. Educational inclusion in this holistic view means the student can access and develop optimally when the three domains—the pedagogical, psychosocial and physical—are taken into account. Therefore, for students with disabilities, being included in school means having access to all three domains equal to their peers in any school setting.

The three theoretical frameworks in this thesis are similar in the way that they all have aspects of the reciprocal process, where the individual and the environment interact and interrelate to each other. Bronfenbrenner's model and the ICF Core Sets have similarities in the way macro- and meso-levels are described as influencing the individual and prerequisites for learning and inclusion. The HEI model has its main focus in the micro-perspective of inclusion, in the interplay between the physical, pedagogical and psychosocial domains and the child's development in the learning environment. Bronfenbrenner's model has the time

aspect as one level, where in the other two models there is no aspect of time aligned with child development.

3 RESEARCH AIMS

This thesis aims to put into operation the practical aspects of inclusive education. The overall aim is to generate further knowledge about applications of inclusive education in mainstream classrooms for students with NDC without comorbidity from a multi-stakeholder perspective. New knowledge on how inclusive education is operationalized and experienced is presented and will have implications for practice and how to build powerful inclusive agendas. Practically, the objectives have been explored by the research questions below.

The thesis' overall research questions are:

- How can educational inclusion for students with NDC be understood from a multi-stakeholder perspective?
- How does educational inclusion work in practice for students with NDC and what key elements are found essential for the development of more powerful inclusive agendas?
- Can interventions develop students' social skills and teachers' inclusive skills for improved educational inclusion?

4 MATERIALS AND METHODS/ METHODOLOGY

In this thesis, the design is mixed methods with both quantitative and qualitative data used for analysis in order to support the findings by both (demonstrated in Figure 1 and Table 2). The design was chosen in order to gain extensive knowledge of the phenomenon of educational inclusion for students with NDC in mainstream classrooms. The data are responses from interviews (Study III and IV) as well as questionnaires (Study II, IV) and a literature search (Study I).

Due to this study's interdisciplinary nature, e.g., education, medicine, psychology and sociology, there is a dualistic approach with equal focus on the individual and the environment. This section will present the research design, the participants and the data collection from the four empirical studies, where the methodological discussion is included. The results for the four studies presented in this thesis form a knowledge base of how to understand educational inclusion and how it corresponds with the micro-perspective of social systems theory (Bronfenbrenner, 1994a).

Table 2. Overview of the four empirical studies.

Study	Theoretical framework	Setting/participants	Methods
I, A systematic literature review	The ICF Core Sets for individuals with ASD The human environment interaction model (HEI)	Students between 5 and 19 years of age and primarily attending mainstream school $N = 6102$ citations, $n = 37$ eligible studies, $n = 14$ in the synthesis	Database search, screening, full-text assessment, quality assessment and synthesized results
II, An intervention study	Pragmatism HEI	Mainstream school, three elementary and lower secondary schools, $N = 26$, school staff, $n = 3$ schools	Intervention based on lesson study methodology, questionnaire, field notes and interviews
III, A multi-informant study of social validity	Bronfenbrenner's bio-ecological systems theory	An upper secondary school, $N = 20$ participants, $n = 13$ students, $n = 5$	Semi-structured interviews

		teachers and $n = 2$ school leaders	
IV, A multi- perspective study of inclusive education	Bronfenbrenner's bio-ecological systems theory	Lower and upper secondary mainstream schools, $N = 53$, $n = 19$ students, $n = 17$ parents and $n = 17$ teachers. $N = 7$ schools	Structured interviews, structured questionnaire, criteria-based interview instrument

4.1 RESEARCH DESIGN

4.1.1 Study I—Systematic literature review

4.1.1.1 Method

The first study of this compilation thesis is a systematic literature review where the research field within accommodations for students with autism was examined. In order to understand how the learning environment is adjusted to meet the needs of autistic children included in a mainstream setting, a review and synthesis of previous international research was conducted.

The design of the study is a systematic literature review that uses database keyword searches and the PICOS protocol for inclusion and exclusion criteria at the level of the abstract. Full texts were read and extraction was used and piloted by researchers before the screening process started. The theoretical framework used for designing the inclusion criteria was the ICF Core Sets for individuals with autism and the human environment interaction model. Moreover, the eligible studies were assessed for quality by using the What Works Clearinghouse (WWC) standards. The researchers were certified in WWC's standards after completing online training.

This study presents findings related to accommodations aiming to improve inclusive education for children and youth on the autism spectrum. The objectives were to analyze, investigate and synthesize accommodations related to the environmental dimensions of the ICF Core Sets for individuals with autism and the human-environment interaction model (HEI), where the learning environment is divided into three categories, the physical, the psychosocial and the pedagogical. It also aimed to identify research gaps and describe current knowledge and the quality of the available research.

A systematic review involves several steps and the recommendation of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses, 2015) statements were followed. The review was registered in advance with PROSPERO (CDR42019124496). The first step was a pilot search in ERIC at the University of Gothenburg, for defining and

sharpening the search terms. The final search was performed by librarians at Karolinska Institutet in the databases MEDLINE (Ovid), PsycInfo (Ovid), ERIC (ProQuest) and Web of Science. Key journals and grey literature were hand-searched in order to guarantee not missing out on relevant articles.

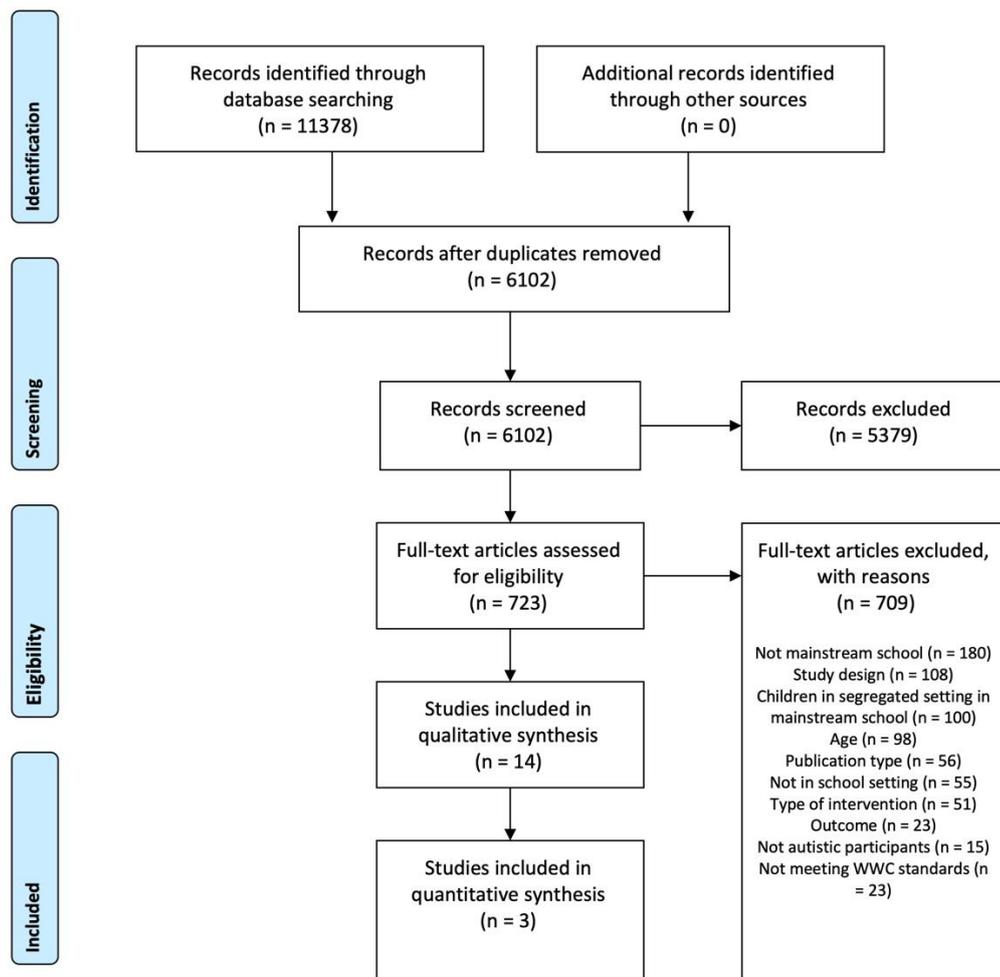


Figure 6. The PRISMA flowchart from Leifler et al., 2020.

4.1.1.2 Inclusion criteria

Students with autism spectrum disorder according to the current or previous editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Diseases (ICD), and between 5 and 19 years of age, and primarily attending mainstream school (50 % or more). The full eligibility criteria are found in article 1, Leifler et al., 2020, Table 2.

4.1.1.3 Model for analysis

Data analyses in study I were performed in several steps. The search yielded 6102 citations. The identified studies' abstracts and titles were read by two independent readers. Only 37 eligible studies were identified, of which 14 met the WWC standards. Studies were selected on eligibility criteria and the selection was conducted using Endnote X9, Clarivate Analytics. Titles, abstracts and full texts were assessed against the eligibility criteria by two independent reviewers. Any report selected by at least one reviewer was then assessed for eligibility based on the full text. Disagreements at this stage were resolved by a third reviewer. All 14 studies are presented in Article 1 (Leifler et al., 2020).

4.1.2 Study II—Intervention

4.1.2.1 Method

The second study in this thesis is an interventional study with the purpose of investigating how and what teachers learn in a modified lesson study model of professional development. The aim of this study was to examine the effects of an intervention, a professional development program designed for teachers' learning. The objectives were to explore teacher efficacy and readiness to teach for student diversity after participating in the program based on lesson study methodology with three learning cycles.

A lesson study is a teacher learning process, used mainly in Asian countries, but which has since the 90s spread across the world (Dudley, 2013). A lesson study as professional development for inclusive teaching has the potential to respond to teaching students with SEND, however these implications thus depend on institutional conditions in schools, e.g., leadership support, possibilities for funding and adequate preparation (Norwich, Benham-Clarke, & Goei, 2021). In lesson study, teachers learn in collaborative groups and the improvement area is based on different aspects of the learning of their students. Literature of effective teacher learning models and conditions suggests that successful teacher learning for improving the learning of the students occurs when the teacher learning is longitudinal, focuses on practice, when there is collaboration among professionals and active experimental enquiries about students' learning and development (Dudley, 2013). This study focuses on classroom action enquiry, developing new practice knowledge and measures more specific teacher efficacy and readiness to teach for student diversity. The independent variable, the intervention, has the name Neurodevelopmental Conditions Awareness Intervention.

This second study is a mixed methods study, where data collection was performed in the form of a questionnaire, field notes and follow-up interviews for social validity. A convergent mixed methods design was used, where qualitative and quantitative data were collected in parallel, analyzed separately and then merged (Creswell & Creswell, 2018), shown in Figure 1, page 226, Leifler, 2020. The pre- and post-test was a questionnaire with both closed and open-ended questions. The open-ended questions were quantified when presenting the results. The questionnaire had three measures: a six-item teachers' self-efficacy scale with a four-point Likert scale (disagree, agree a little, agree and agree a lot), open-ended questions covering the different areas of providing support in the learning environment—the pedagogical/didactical, psychosocial and physical—and finally a student case. The student case was modified based on the age of the students the participating teachers were teaching. Teachers' self-efficacy was measured through the indexed variables of *I have enough competence to teach children with neurodevelopmental conditions*, *I have enough competence to adjust the learning context for children with neurodevelopmental conditions* and *I know many concrete and valuable accommodations that work well for children with neurodevelopmental conditions*. The reliability analysis with Cronbach's alpha was $\alpha = 0,80$. An additional variable was *I need professional development to teach and meet the needs of children with neurodevelopmental conditions*. This variable was not indexed due to the complexity of the concept and evaluation of participants.

4.1.2.2 Participants

In total 26 school personnel participated in the NDC AI. There were 20 female staff and 5 male staff. All teachers had many years of experience of teaching. See Figure 8 for teachers' years of experience. The mean level of years of experience was between 11 and 15 years. Years of experience was categorized after the figures: 1 = one year or less, 2 = 2–5 years, 3 = 6–10 years, 4 = 11–16 years, 5 = 16–20 years and 6 = more than 20 years. Elementary teachers (n = 13) were the largest professional group, followed by subject teachers in middle school (n = 9).

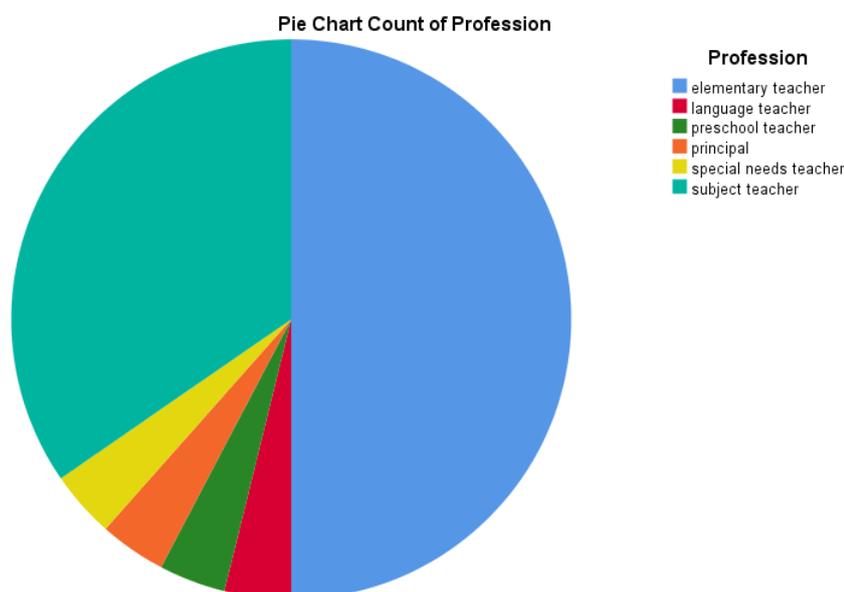


Figure 7. Professions represented among participants.



Figure 8. Personnel’s years of experience.

4.1.2.3 Instrument

Paper II, the implementation of an intervention designed for teachers’ learning, took place at two elementary and one middle school during a period of five months. The participating personnel took part in a professional development model based on the lesson study methodology. The intervention model/PD took part in the school environment, three times with two hours each time, in total about 6 hours. The time period between sessions was about two weeks. In the between time, the teachers had homework, such as reading literature and research about neurodevelopmental conditions and possible difficulties in learning and handling the school environment. The intervention model procedure is presented in Figure 2, page 228, article 2. In sum, the intervention content consisted of

- In-depth content knowledge of NDC, a theoretical background
- Information about and demonstrations of how to implement support in the classroom, i.e., evidence-based methods for students with NDC
- Knowledge of concrete accommodations, how to differentiate teaching and instructions
- Strategies for handling students with challenging behavior
- Collaborative discussions and literature reading with reflections
- Feedback from the researcher during the intervention

The intervention for teachers consisted of three lesson study cycles, where the participants followed the four-step process; study, plan, do and reflect (Lewis, 2015). The researcher showed and demonstrated (modeling) evidence-based strategies, methods and how to adjust the learning material for students with NDC in cycle 1 and 2, where some examples are presented in Table 3. The teachers were then supposed to choose one or two accommodations to implement in the learning environment between sessions. For the purpose of evaluation and follow-up discussions, this was documented by the researcher. There were accommodations linked to the three different domains of the learning environment, the pedagogical content/didactical, physical and psychosocial. Table 3, shows a selection of accommodations presented for the teachers.

Table 3. Accommodations in the learning environment.

Physical accommodations	Psychosocial accommodations	Pedagogical/didactical accommodations
Individual place—possibly with screen added, listen to the student	Strengthen the relationship with a challenging student by asking a personal question every day	Visual support—develop and improve your visual support to the whole class or to an individual student with their own schedule on the bench
Individual place in the dressing room for sports class, the same place every time	Raise a student who is usually noticed negatively in a positive context	Complete working tasks with information and with a step-by-step guide
Canteen—individual place close to the teacher	The whole group—choose an activity for strengthening the class community	Highlight all material in the same subject in one color. Mark the shelves for the material of the subject in the same color.
Classroom or the hall—stimuli sanitize	Recess activities	Develop more checklists to a subject or a class
Retreat room—a room for rest and calming feelings close to the classroom	Let a student present their special interest	Homework—double sets of books and work sheets

(Derived from the content in the NDC AI for teachers in Paper 2, Leifler, 2020).

4.1.2.4 *Model for analysis*

The data collected in study II was handled in the SPSS software. The closed-ended questions were analyzed in SPSS (Version 27) by the Wilcoxon signed-rank test and by descriptive statistics. The qualitative data was first analyzed by coding the data from each domain and categorized and thereafter quantified at both pre- and post-test. The student case responses were also quantified by calculating the number of accommodations at pre- and post-test. The field notes were analyzed in terms of teachers' standpoint and changes of values for teaching diversity. The follow-up interviews were analyzed manually by linking the answers to social validity, which is, for example, satisfaction with the intervention.

4.1.3 **Study III—Semi-structured interviews**

4.1.3.1 *Method*

The third study had a qualitative approach using in-depth semi-structured interviews with students, teachers and school leaders ($N = 20$). The theoretical stance for interpretation of the results in this study is the model of social validity by Wolf (1978), together with the socioecological framework by Bronfenbrenner (2005). The social validity was categorized into a framework for interpretation with satisfaction, acceptability and feasibility as lead concepts. The study is a multi-perspective study examining social validity of social skills group training (SSGT) for autistic adolescents and those with ADHD in a mainstream school setting. Social communication challenges are defining features of autism and associated with other NDCs. SSGT in clinical settings improves social outcomes for autistic individuals, and we aimed to examine the perceived feasibility and acceptability of SKOLKONTAKT, an adaptation of the clinical SSGT KONTAKT tailored to educational settings. The SSGT was conducted by regular school staff, and the adolescents received their training in their natural educational environment. The social skills curricula in the intervention aimed to improve social skills in areas where youth with NDC are typically lacking. The content of the SSGT is described in detail in article 3, page 6–8, Leifler et al., 2022.

The objective of study III was to explore the social validity of SSGT in educational settings. We explored the lived experiences of SSGT by interviewing students, teachers and school management staff. The aim was to examine if SSGT in a naturalistic setting is feasible and satisfying for improving social skills for students with social difficulties. The SSGT is derived from KONTAKT, social skills training for autistic individuals focusing on improvement in social interaction and communication (Afsharnejad et al., 2021; Bölte et al., 2021b).

In the third study, social validity was explored by in-depth interviews. The interviews took place at school or digitally at school or home (during Covid-19). The interviews were audio-recorded. The questions were similar to investigate the phenomenon linked to the social validity from Wolf (1978). However, the questions were modified after the responding group of participants. The questions are presented in Table 4.

4.1.3.2 Participants

In total, this study had $n = 20$ participants divided into three groups, where the largest group are 13 adolescents with NDC who had received either SSGT ($n = 6$ from the intervention group) or other social group activities ($n = 7$ from control group). The next group was $N = 5$ teachers who had provided SSGT or social group activities to the students. Finally, there were $n = 2$ principals, the school management. Student participant characteristics are presented in Table 1, page 5, in article 3.

4.1.3.3 Instrument

Table 4. Interview guides by respondent group.

Students	Teachers	School leaders
Which elements and contents from the training*/activities** do you recall?	Generally, what do you recall from the training/activities?	How did you receive information about the training/activities and the research project?
Which parts of the training/activities did you like the most, and why?	Which parts of the training/activities did you like the most/the least, and why?	Do you think there is a need for the training/activities in school settings?
Which part of the training/activities did you like the least, and why?	Are training/activities like this appropriate as part of your work at school?	Is the training/are the activities appropriate for your school setting?
Is there anything in the training/activities that you would have liked to train/do more or less?***	Is there anything about the training/activities that you would have liked to focus on/do more or less?***	In your role as school leader, what did you need to consider and had to arrange to implement the training/activities at your school?
What did you think of the group discussions?***	What did you think of the group discussions? The themes of the discussion, were they appropriate and valuable?***	In which way have the training/activities positively and negatively influenced daily life at your school?

What did you think of the training homework?***	What did you think of the training homework?*	Can you see any changes among the adolescents or the teachers associated with the training/activities?
Do you think some parts of the training/activities might have helped you? Which activities and why?	Do you think some parts of the training/activities might have helped the adolescents? Which activities and why?	Is it realistic and possible to implement the training/activities at your school in the future?
Do you think the training/activities have improved your social skills? In what way?	Have you seen any enhanced interactions or improved social behaviors in the adolescents following the training/activities?	What is important to consider for implementation of the training/activities? What training, resources and support do your staff need for implementation?
Are there any concrete or specific changes, positive or negative, in your life that you think is due to the training/activities?	Are there any concrete or specific changes, positive or negative, that you have observed or noticed that you think are due to the training/activities?	Are there any areas of possible improvements in your view according to the whole process and co-operation with researchers?
Do you think participating in the training/activities will give you long-lasting improved social skills in life or in school? If so, in what way?	What do you think of long-lasting effects after the training/activities? Are there any? Have you seen any?	Which parts of the training/activities do you think are valuable or less valuable for your school?
Is there anything that could be better or done differently in the training/activities?	Is it possible and realistic to conduct training/activities like these in school in the future?	Do you think the training/activities have any spin-off effects for the adolescents in school and outside?
Were there enough, too many or too few training/activities sessions?	What do you think of the amount of the training/activities' sessions?	Do you think the number of sessions of the

		training/activities were appropriate?
<p>What do you think of the fact that this training is in your school? Is it positive or negative?</p> <p>Have you taken part in training/activities like this before somewhere else?</p> <p>Did the training/activities put an additional burden on you?</p>	<p>Do you think you have gained more knowledge and tools to help and understand your students, to develop the adolescents' understanding of others, to develop the acceptance of the adolescents among others, to motivate and teach the adolescents to strengthen social interaction, to modify your teaching in order to help students to reach their goals, and help the students to develop self-esteem?</p>	<p>Do you think your teachers have gained more knowledge and tools during the training/activities to help the students to develop skills and reach social goals and other achievements?</p>

Note. *The training = Social Skills Group Training (SSGT), **The activities = social activities control intervention, ***only in students and teachers receiving or conducting SSGT. (Table originally from Leifler et al., 2022)

4.1.3.4 Model for analysis

Interviews from study III were audio-recorded, transcribed verbatim and then coded to condense the material into consistent emerging themes using thematic analysis. Thematic analysis is an aid to use within different methods (Braun & Clarke, 2006). The method identifies and analyzes patterns and themes within a data set. During the use and analysis, one can code for a specific theory, called the deductive approach, or the themes can develop through the coding process, the inductive approach. The analysis of the transcribed interviews in this study was performed in several steps. The first step was reading all text from the interviews to gather an overview of the material. The next step was reading more closely and taking each participant group separately. Thereafter, the multi-step process was followed with: (i) generating initial codes, (ii) collating codes into potential themes, gathering all data relevant to each theme, (iii) defining and naming themes, generating a thematic map of the analysis, (iv) generating clear definitions of each theme, (v) final analysis and interpretative process with the research questions, theoretical frameworks and literature and (vi) comparison between themes in SSGT versus social activity control group. The process of translating the transcribed data into small units of codes and translating codes into building blocks for themes and subthemes representing patterns of meaningful core ideas was facilitated by using NVivo 12 (QSR Ltd., Burlington, VT, USA). Additionally, the thematic

analysis was performed by placing pieces of transcribed material onto posters with different colors by hand. Interview questions are presented in Table 4.

4.1.4 Study IV—Quasi-experimental study

4.1.4.1 Method

The fourth study is an ex-post facto quasi-experimental and correlational study. Study IV explores on a micro-level how inclusive education is expressed from multiple perspectives, i.e., the student, the caregiver and the specific teacher teaching the student. The study has a mixed methods approach, and the synthesis of the quantitative data is included in this study. The additional qualitative data will be presented in the future.

In this fourth study, we examined experiences of educational inclusion by using a modified version of the instrument INCLUSIO, used in a previous large-scale investigation of inclusive education (Bölte et al., 2021a). In the previous research, there were considerable differences between the responses from the diverse personnel. This study investigated consensus around perceived educational inclusion of autistic and other neurodivergent adolescents, their caregivers and their teachers. This study approaches inclusive education by looking at how it is expressed and valued by using a criteria-based instrument. The instrument was used in a triangulation process, where the same but modified questions were asked from a different participating group of responders. The aim was to investigate educational inclusion by applying the implementation of inclusive measures from the view of students with NDC, their caregivers and teachers.

4.1.4.2 Participants

Participants were recruited from mainstream high and secondary schools. The study is a multi-responder study where the participants are the students, the caregivers, the teachers and the paraprofessionals. This triangulation will increase the validity of the data through the convergence of information from different participants. Seventeen triads of informants plus two single students ($N = 53$) from mainstream secondary and high schools in Sweden were inquired from with the standardized INLCLUSIO interview operationalizing educational inclusion domains. The participating adolescents had NDC diagnoses, where the primary diagnosis was ADHD for 12 of the students and ASD for seven of the students. Gender representations among adolescents were 15 male and four female, among caregivers four male and 13 female and among teachers five male and 12 female.

Table 5. Participants’ characteristics in study IV.

School	Gender	Age	Diagnosis	Comorbidity	Caregiver	Teacher	Years of experience

1	male	18	ASD	ADHD, dyslexia	mother	female	2
2	male	15	ADHD		mother	male	20
3	male	17	ADHD		mother	male	6
3	male	17	ADHD	dyslexia	mother	female	10
3	male	17	ASD		mother	female	7
3	male	17	ADHD	dyslexia	mother	female	14
4	male	15	ASD	ADHD	mother	female	32
4	male	15	ADHD	ASD	father	female	22
5	female	15	ADHD		mother	male	20
6	female	15	ASD	OCD, PTSD	mother	female	15
6	female	15	ADHD	ASD	father	female	15
7	male	20	ASD		mother	male	25
7	male	17	ADHD		father	female	6
7	male	17	ADHD		mother	female	7
7	male	19	ASD	ADHD	father	female	21
7	male	19	ADHD		mother	male	12
7	female	18	ASD	ADHD	mother	female	15
7	male	19	ADHD	ASD			
7	male	18	ADHD				

4.1.4.3 Instrument

Study IV builds on a previous investigation (Bölte, Leifler, Berggren, & Bölte, 2021), which was a large-scale study where school staff completed a questionnaire, the INCLUSIO instrument with 61 Likert-scaled items exploring educational inclusion. The questionnaire is a face and content valid scale ($\alpha = 0.87$), developed by experts, and is based on a Delphi process with piloting the questions. The INCLUSIO instrument used in study iv was derived from the original instrument, also in a Delphi process with researchers and schools. The modified questionnaire has 21 items ($\alpha = 0.84$). The data collection method in the fourth study was structured surveys conducted through interviews. Inclusive practice was measured by the 21 items from the questionnaire INCLUSIO (Bölte et al., 2021). Categories from the learning environment covered by the subscales are *assessment of support needs, use of individualized support, implementation of a structured learning environment, individual changes applied to schedule/teaching, functional response to behavioral characteristics, cooperation with parents, consideration of peer-relations* and *staff education/professionalism*. Full item description is found in the appendix, Table 1, additional data to unpublished manuscript as well as in the results section below. The items are Likert-scaled and scored 0–3, where 3 is “yes” and indicates a positive inclusive practice, score 2 is “rather yes” and indicates a moderate inclusive practice and score 1 is “rather no”, indicating doubtful inclusive practice, and finally, score 0 is “no”, indicating no inclusive practice. There was also the answer “I don’t know” scored 9 and converted to 0, indicating no knowledge of inclusive practice.

4.1.4.4 Model for analysis

The collected interview data was analyzed in SPSS/Windows 27. The analyses performed were descriptive statistics, inference statistics and intercorrelations. As a first step, the data was handled manually where areas of strengths and weaknesses were identified. The inference statistics analysis was conducted by comparing groups applying general linear modeling (MANOVA) across INCLUSIO total, domain and item scores. There was a post-hoc Tukey test for single group comparisons and Kappas were computed using crosstabs for all INCLUSIO items and diverse responding group to determine the agreement or disagreement. Pearson intercorrelations were run to investigate the relations between single inclusive measures and domains and rated overall educational inclusion.

4.2 ETHICAL CONSIDERATIONS

4.2.1 Overall ethical considerations

The thesis has an empirical basis, constituted by investigation of students, parents’ and teachers’ experience of inclusive education. This implies investigations where the students themselves are being studied and interviewed. In relation to this, ethical considerations have been made throughout the whole research project. The studies were conducted in accordance with the Declaration of Helsinki and all projects carefully take into account ethical issues related to research in humans and their privacy and follows SOU 1999:4 and Codex

guidelines. Particularly as it includes minors, individuals who are vulnerable or unable to consent. Some studies interfered with regular educational routines, and participants or units are randomly allocated to treatment/environment as usual or a potentially more effective condition. Involvement in this line of research might also enhance the children's experience of otherness. All these challenges have been addressed with adequate means. For the studies that involve personal data, III and IV, there is ethical approval. There was no need for ethical approval for study I and II. Prior to all data collection, the consent of students, parents, teachers and school management was first sought by sending information about the purpose of the research, how data would be collected and results presented in the future. Thereafter, detailed information and informed consent were shared both orally and in written form. Before, during and after participation, there were opportunities to ask questions.

Personal data was handled in accordance with Swedish law, and there are unique codes for each participant, where all participants are anonymized. In the second study, the professionals used fictitious names, thus, there are no names at all presented in published articles. The data is stored in fire-resistant locked cabinets. Further, the studies have been carried out in accordance with The General Data Protection Regulation (GDPR, 2016/679a). This implicates that collected personal data have been handled with respect for the individual's integrity.

The recruitment process in the studies was ethically challenging, to ask for participation (inclusion criteria is having a diagnosis) and at the same time avoid the feeling of otherness. Regarding ethics in practice, the interviews have to align, i.e., the student and the parent and the teacher who actually teaches that specific student. At times the students did not want the parent to get involved (the two single interviews in this study). Another challenge was informed consent, as making everything transparent to an individual with, e.g., autism is difficult. All vulnerable groups and individuals need protection when it comes to research (Vetenskapsrådet, 2017). The school environment can be challenging and hard for students with autism. Listening to the voices of the students themselves is significant when contributing new knowledge. The guidelines for medical research where research is justified when the research cannot be carried out on a non-vulnerable group can help social science with ethical considerations. The vulnerable group should also benefit from the knowledge. In this research project, with the aim of examining inclusive education for future improvements regarding the overall learning experience and quality of life for a group of students who struggle more in school, the project is justifiable. During the interviews in study III and IV, the students sometimes brought up sensitive topics and information challenging to listen to and handle. For unexpected events and stories, the researcher has the experience as working as a special needs teacher, which has been important for understanding the context. Children as informants can have limited vocabulary. Students with autism can have difficulties with expressions and vocabulary. To build trust and being humble has been the path for the researcher in this project. In the third study, I had an ethnographic approach to the situation before the interviews took place. I spent time in the school environment, e.g., at lunch and at

recess to build up trust and become a more well-known face, which was valuable when interviewing sensitive participants with social difficulties.

4.2.2 Ethical and methodological considerations with the individual studies

The first issue was a conceptual challenge, where there were different approaches to interventions regarding the individual or the learning environment. The inclusion criteria were only interventions directed towards the learning environment, which meant the child or adolescents should not do any training to adapt to the school context. Interventions are mostly conducted in clinical settings, which have their advantages, but for generalization and long-term effects, a naturalistic setting can benefit the child more. Other researchers' subjectivities (Lather, 2013), no clear boundary and different understandings of the learning environment were challenges in this project. There was a conceptual challenge and epistemological issue (Morgan, 2007). The epistemological issue was active during the start of the project, in line with what Morgan (2007) describes as a version of a paradigm with shared beliefs within a community of researchers who can share a consensus about which questions are most valuable and be answered with most appropriate procedures. This is similar to Pedersen and Pini's (2017) thoughts, where the complexity with researchers' familiar concepts, approaches and ontologies may influence standpoints and aspirations for methods. The next challenge was to reach inter-rater agreement in all steps of the search and screening process. We had to pilot a lot of studies to reach agreement. Another challenge was finding a journal in between the educational and medical field. Most medical journals do not have the same meta-language as the educational field, which in this interdisciplinary research project was another challenge, together with the choice of journal. St Pierre (2018) claims we should avoid an instrumental approach and study philosophy, ontology and epistemology, although this is not always an available approach. To summarize the methodological challenges with the first study, I use the descriptions by Morgan (2007): *lines of action*, where all researchers are aware of their own subjectivity and worldviews, *warranted assertions*, researchers' awareness of the beliefs behind the actions and *workability*, the consequences that follow different behaviors.

A common methodological problem in treatment effect studies is small sample sizes. Larger samples allow for better control over subject variability, thereby increasing both internal and external validity. The sample size in study II, the intervention for teachers, was 26 participants, which might be just on the border of saturation. The conducted statistical test took this into account (Wilcoxon signed rank test). The recruitment process is essential information in order to facilitate the replication of the study as well as the generalizability. There were several challenges with this study. First, no control group. In educational research it is hard to motivate and find a group of teachers with time and willing to take part in an intervention just as a control group, even if offering the intervention afterwards. Attrition is a challenge in most fields, but especially with social science and teachers. In this study, all included participants in the project were present in all three of the lesson study cycles for the ability to measure the effects of the intervention. The next challenge was conceptual and how

to be sensitive to the target group, students with NDC, and how to avoid stigmatization and cultivate the teachers' belief in this group. The teachers need to be aware of the disadvantages and at the same time have high expectations for this group. The labeling needs to move beyond a discussion of what labeling does, to reach deeper knowledge and be more hands-on, or create tools to meet and teach these students in mainstream classrooms. Furthermore, just like Bryman (2006) highlights, there were issues with how to combine the two data sets and with appropriate integration. The discourse tends to stand on its own two legs, and the lack of conciseness, integration and clarification has to be handled with it. In this study, the false primacy led to difficulties with integrating the qualitative part of the study. One issue is the large amount of data and how to make a short and concise synthesis. Creating an alternative paradigm is challenging (Morgan, 2007). The qualitative data in this study was synthesized by quantification. The categories were counted and compared from pre-test to post-test. There was not enough space in the article to cite participants. The word limit can be an issue in mixed methods design.

Measuring the teachers' capacity in this study was not aligned with measures of actual changes in the learning environment, however there were validity assessments, e.g., by comparing the responses of self-efficacy and number of modifications/accommodations described in the student case during cross-tabulation calculations in SPSS (Version 27). This is demonstrated in Table 6 below. This validity check was made at post-measure.

Table 6. Cross-tabulation between one item in the concept of self-efficacy and number of modifications in the student case.

Number of modifications		3	5	6	7	8	10	11	15	Total
I know many concrete and valuable modifications for children with NDC	disagree	0	1	2	1	0	0	0	0	4
	agree a little	1	1	4	3	1	1	1	0	12
	agree	0	1	0	4	3	0	1	1	10
	agree a lot	0	0	0	0	0	0	0	0	0

Total										26
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The reason for assessing the number of described accommodations/modifications with the item *I know many concrete and valuable modifications for children with NDC* was to compare the two measurements for evaluating the validity in the answers. Teachers responding with agree, for example, had the amount of 7–8 different modifications, whereas there was an alignment between the two measurements.

The third study was approved by the national Swedish Ethics Authority (2019-00263). The participating adolescents and their caregivers had previous informed consent for the RCT, but were informed again and given detailed information over participating in the follow-up interviews. The participating teachers and school management were also provided with oral and written informed consent prior to participation. Further, with a semi-structured interview guide, there are fewer opportunities to find serendipity during the research process. The ethical dilemma here might be as to how to be transparent and write down everything possible in advance and, at the same time, be open-minded and listen to unexpected phenomena and follow the path of the participants' views. Some of the adolescents shared sad school experiences that had to be handled with care and led to unexpected extended time during the interviews, an ethics in practice challenge (Guillemin & Gillian, 2004). Computer-assisted content analysis is sometimes seen as the golden standard to use for data analysis of qualitative interviews. The Nvivo program (Alfa-soft) used in the project was the proper solution for organizing the data, but almost anything the program can do, the researcher can do manually. There is no inter-subjectivity in using the program. The researcher defines the codes and categories, and the program finds themes in the responses. The data program is cutting and pasting the coding (Lather, 2013). Inter-subjectivity is when the data is shared among the researchers and codes are formulated by several researchers. The data collection from the interviews was in the first step handled manually by the researcher. This gave a more overall picture of the responses before creating the thematic landscape of social validity. Another issue is unpredictable situations, like the current situation with Covid-19. The situation changed the data collection procedure, and the RCT was transformed into on-line training and there was a need for ethics in practice (Guillemin & Gilliam, 2004), where interviews were conducted virtually, which led to less extensive answers from students. Threats to external validity (Creswell & Creswell, 2018) in study III was the characteristic of the participants as well as the small sample size, where the results cannot be generalized to individuals in other settings.

The fourth study was approved by the Swedish Ethical Review Authority (2019-02937). The recruitment process was challenging due to Covid-19, where all aspects of the research and the information had to be clear for the participants. Moreover, the informed consent was sent back and forth by traditional post-delivery. The first interviews took place in school or in a home setting, and the safe environment afforded the researchers additional data due to the many responders wanting to share their history. Some of the interviews with caregivers were

up to two hours long. The additional data will be analyzed as a follow-up, to give the stakeholders the right to express their views on practical inclusion and how it is working or not working in Swedish mainstream school settings. The instrument INCLUSIO has established validity. However, considerations of construct validity (Creswell & Creswell, 2018) were present, where aspects, such as whether the instrument covers relevant domains of educational inclusion for students with NDC and therefore fulfills its research purpose. The instrument was assessed as valid and the internal consistency was quantified by Cronbach's alpha (0.84). Correlations, as part of the results in study IV, are useful in social studies. However, it is not synonymous with causal relationships (de Vaus, 2001). We compared groups by examining the association or correlation between variables and tested how the variables in INCLUSIO co-varied. The items covered eight domains of the learning environment. However, some of the variables had more relevance for, e.g., ASD and others for ADHD, but the overall fit for the objectives was fulfilled.

The aim of study IV is to understand educational inclusion through voices of the students themselves, their caregivers and teachers, but safety and students' well-being came first. There need to be thoughts of respect, dignity and integrity. Another important aspect is the confidentiality and how to handle personal information, such as the diagnosis, with care. Notions of "participatory" research have recently sought to foreground the voice of marginalized students. New researchers, such as the author, with less experience, who try to understand the experiences of those learners at the margins, might find themselves in challenging territory. Do not put a label on it, but search for deeper understanding, which can be challenging. The researcher has to ask how to avoid identifying children as a homogeneous group, e.g., children with SEND or NDC, in order to make a broader contribution to educators. There is a quest for inclusion and that demands knowledgeable school professionals. How can we use the medical model with labeling and descriptions of disadvantages without stigmatization? Is it possible to integrate two fields and worldviews for a better learning environment? This is a challenge, bringing up the disadvantages for a group of students and at the same time educating teachers not to feel it is something special with these children and a question for an expert. At this point no agreed definitions worldwide of SEN or Inclusive Education exist and this might be a dilemma. However, the philosophy of inclusion and conflicts with different parts of the education system is one way to address the phenomena. Another way to address it is to seek information from the group that we seek the least information from, the child or young person with additional needs, which is one of the purposes of this study. The participants had to be 14 years of age, which was relevant due to the number of questions and the complexity of the questions. A younger age would not be recommended as younger children do not have enough experiences of the critical transition from grade 6. However, this has resulted in only capturing those students who succeeded in continuing in a mainstream school-placement. To highlight one of the issues with study IV, integrity, ALLEA has advice to give: "A basic responsibility of the research community is to formulate the principles of research, to define the criteria for proper research behavior, to maximize the quality and robustness of research, and to respond adequately to threats to, or

violations of, research integrity” (ALLEA, 2017, p. 3). In this study, as well as in study III, the adolescents shared unexpected life experiences, e.g., histories of drug use, criminality or not wanting to live anymore, which was challenging and had to be handled with care.

5 RESULTS

The overall aim with this research was to contribute to the understanding of educational inclusion for students with NDC without comorbidity in mainstream school settings. The compilation thesis has four separate articles, which together answer the overall research questions. Each of the studies have results linked to specific underlying research questions, leading to answering the overall research questions, i.e., how to understand inclusion from the perspective of multiple stakeholders and how educational inclusion is working in practice.

First, the main results from the four individual studies are presented along with how they answer their specific research questions. The results will thereafter be summarized along with how the two overall research questions are answered. The key findings are further presented in regards to actions and challenges in Table 13 at the end of this section.

5.1 STUDY I—SYSTEMATIC REVIEW

The first study of this compilation thesis is a systematic literature review aiming to understand how the learning environment is adjusted to meet the needs of autistic children included in a mainstream setting, and a review and synthesis of previous international research was conducted. The question for the systematic review was: what accommodations are there in the learning environment for autistic students in mainstream school settings? There were 14 studies with accommodations in the learning environment that met the WWC standards with or without reservations. The majority of the articles used single case design. Other designs that were featured were group design with or without comparison. The studies were mainly from the USA. Four of the studies with evidence of effect targeted the psychosocial environment and ten of the studies with effect targeted the pedagogical environment. Ten of the 14 studies involved outcomes concerning functioning in school, where social interaction was measured, and five of the 14 studies assessed educational outcomes in the form of academic achievement. The evidence from the review suggests that specific forms of peer interventions and paraprofessional training seem to improve functioning in school. Moreover, accommodations for enhancing educational outcome are behavioral procedures, self-regulated strategies, computer-based programs and prompting procedures.

No Swedish or Scandinavian studies met the inclusion criteria, and among the 6102 studies, there were fewer than five studies from the Scandinavian countries. Due to the large number of studies, the screening process identified various and diverse accommodations and interventions conducted in the field, e.g., music, animals and implementing green spots in the environment together with more innovative approaches. However, none of these studies met inclusion or quality criteria.

This research synthesis concluded that there are promising approaches for enhanced inclusion in mainstream school settings for students on the autism spectrum. The objective of this study was to investigate and gain an overview of accommodations mapped as environmental

factors for students with ASD, as well as their effects on school performance, functioning in school and quality of life. The research questions *what are the obstacles and opportunities in the learning environment for students with autism in inclusive school settings* and *which interventions and accommodations are effective in improving inclusive education for students with autism in mainstream settings* are answered below.

Opportunities in the learning environment for students with ASC are didactical accommodations for tasks, prompting procedures for on-task behavior, social interventions for better functioning and video-modeling for understanding and preparing for different situations in school. Obstacles are the lack of interventions, accommodations and adequate adjustments within the holistic perspective, which means all three domains of the learning environment (pedagogical, physical and psychosocial) might need adjustments. Areas of strength are the scaffolding systems that are implemented. However, they are only small-scale in inclusive settings. Weaknesses include poorly implemented accommodations or interventions to enhance well-being, as well as no investigations of how improvements in the physical environment can create better educational inclusion, although the quantitative design might have excluded explorations of this art. There was no Swedish literature on the issue, but still, there are reasons to believe the accommodations in the review will have an effect on students' educational inclusion in Swedish school contexts. Further opportunities are peer interventions for an improved psychosocial environment, such as the five interventions included in the review. The first intervention engaged peers to interact and play with children on the playground; the second intervention was ENGAGE, creating social groups at school; the third was training paraprofessionals to enhance social interactions; the fourth examined social groups at recess and during spare time designed after students' preservative interests; and the fifth study used a peer-mediated teacher strategy, class wide peer-tutoring. There were several excluded studies aiming to improve the psychosocial environment due to study quality. The interventions in the psychosocial domain were related to the second level ICF codes e320 (acquaintances, peers, colleagues, neighbors and community members), e325 (friends), e420 (individual attitudes) and e465 (social norms). They were related to belonging and participation.

The nine studies that met the WWC standard focused on functioning in school and academic achievement. Interventions for task acquisition were prompting, fading and tokens and working with a reward system. One intervention assessed cooperative learning groups for problem solving and enhancing on-task behavior. Three interventions explored and evaluated assistive technology, i.e., video-modeling and vocal output for on-task engagement. The accommodations in the pedagogical environment covered by this body of literature concerned the ICF codes e125 (products and technology for communication), e130 (products and technology for education) and e455 (individual attitudes of other professionals).

In summary, effects were seen for students' academic achievement and functioning in school for academic tasks strategies, number of words in writing sample, holistic quality of writing, transitions between school activities, social interaction, social initiation and social

engagement and on task behavior. The studies in the review assessed educational outcome and functioning in school, but none of the studies assessed well-being or quality of life. These results identified a gap in Swedish schools where there are few accommodations or interventions aiming to improve learning and functioning, e.g., towards enhanced content achievement in mathematics, reading or writing.

5.2 STUDY II—TEACHER INTERVENTION

In study II, the aim was to measure the effects of an intervention for teachers' learning. The research questions were: *To what extent does a short PD program enhance teachers' general readiness to create an inclusive learning environment for students with NDC?* and *What changes in differences of perceived self-efficacy can be found after the intervention?*

Examining at pre-intervention whether participants felt educated enough to teach students with NDC, similar to the large-scale investigation (Bölte et al., 2021a), teachers' years of experience were not correlated to the statement *I have enough competence to teach students with NDC* ($r = .452, p = .021$).

The results show that teachers were more capable of teaching students with NDC after the intervention by having more knowledge about how to both properly prepare and adjust the learning environment and teach for diverse needs. The result showed changes in teachers' self-efficacy, readiness to prepare the learning environment for students with NDC, enhanced awareness of NDC and how to more sufficiently support these students in the classroom. Teachers reported enhanced self-efficacy and competence in teaching children with NDC after the intervention. Figures 9 and 10 contain an example of one of the variables for measuring teacher efficacy. In the item *I have enough competence to teach children with NDC*, 19 % of the participants had disagree, 54 % had agree a little and 27 % had agree before the intervention, where the same item at post-intervention had 42 % of the participants answering agree a little, 50 % agree and 8 % agree a lot.

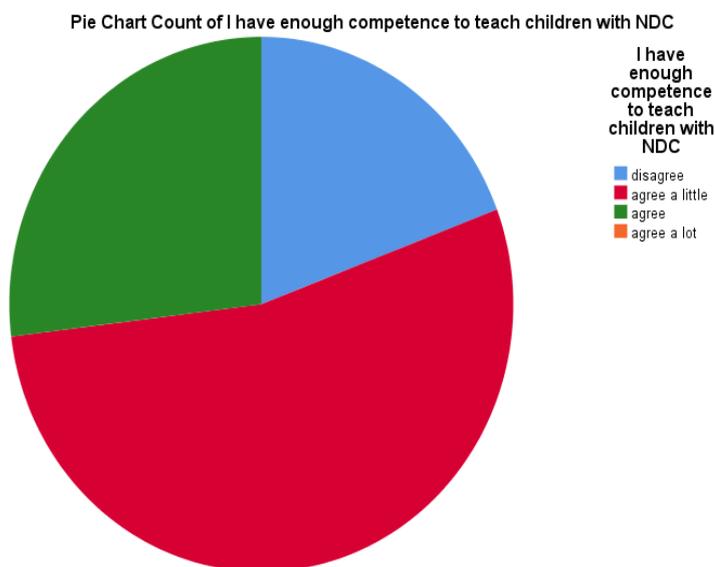


Figure 9. Pre-intervention responses for enough competence.

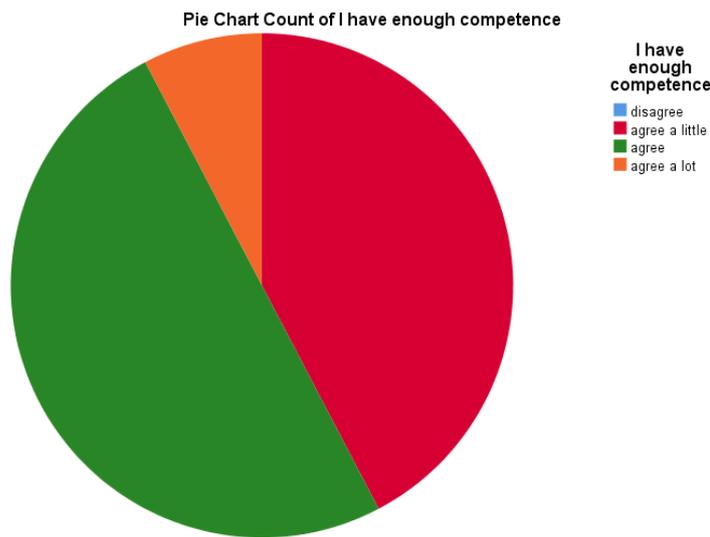


Figure 10. Post-intervention responses for enough competence.

Teachers showed more competence in how to adjust all areas of the learning environment (pedagogical, physical and psychosocial), where the largest increase was found in the psychosocial domain, where the number of accommodations was doubled. The difference between pre- and post-intervention was 24 accommodations in the physical domain (mean 8), 42 in the psychosocial domain (mean 14.33) and 49 in the pedagogical domain (mean 18.7). The psychosocial domain was described by teachers as an area of failure in providing support in the learning environment. There was a case student in the survey, and the number of accommodations that teachers described rose from its initial value of 23 out of 26 teachers. To summarize, a short professional development program is effective and has the potential to enhance teachers' inclusion skills. Teachers expressed high satisfaction with the program, for example, with having time together to discuss common values for inclusion, time to learn more about accommodations with distinct focus on what is beneficial for students with NDC, time to evaluate and discuss the classroom climate and the need of improvements and time to implement adjustments in the learning environment.

The content in the sessions/cycles was to a large degree on practical dimensions of inclusion, and the facilitator demonstrated concrete strategies and evidence-based methods. The teachers implemented support in the classroom based on the content from the professional development. In between sessions there were chances to have collaborative discussions and reflections. The item *I know many concrete and valuable modifications for children with NDC* had at pre-intervention 15 % of responses disagree, 46 % agree a little, 38 % agree and no agree a lot, and at post-intervention the responses were no disagree, 27 % agree a little, 62 % agree and 12 % agree a lot.

Pie Chart Count of I know many concrete and valuable modifications for children with NDC

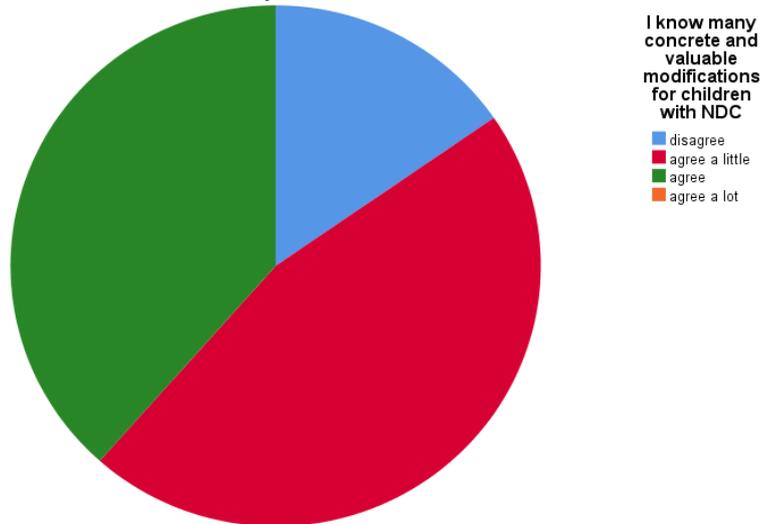


Figure 11. Pre-intervention responses for knowing how to adjust the environment.

Pie Chart Count of Concrete and valuable accomodations

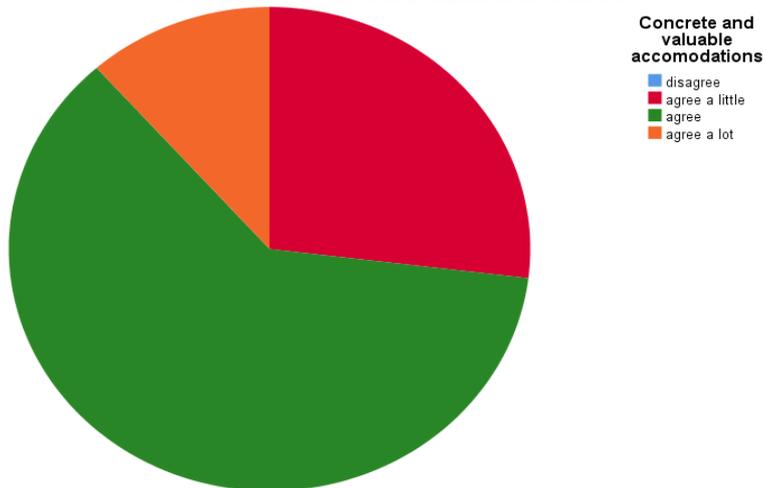


Figure 12. Post-intervention responses for knowing how to adjust the environment.

One of the measures in the intervention was based on a student-case. There was a description of a fictive student in need of support, where the impairments and description are associated with difficulties one can have when one has an NDC. The student's age and difficulties were modified according to the teachers and the age/level of students they taught. The total number of modifications/accommodations for the student increased by 23 out of 26 participants (88 %).

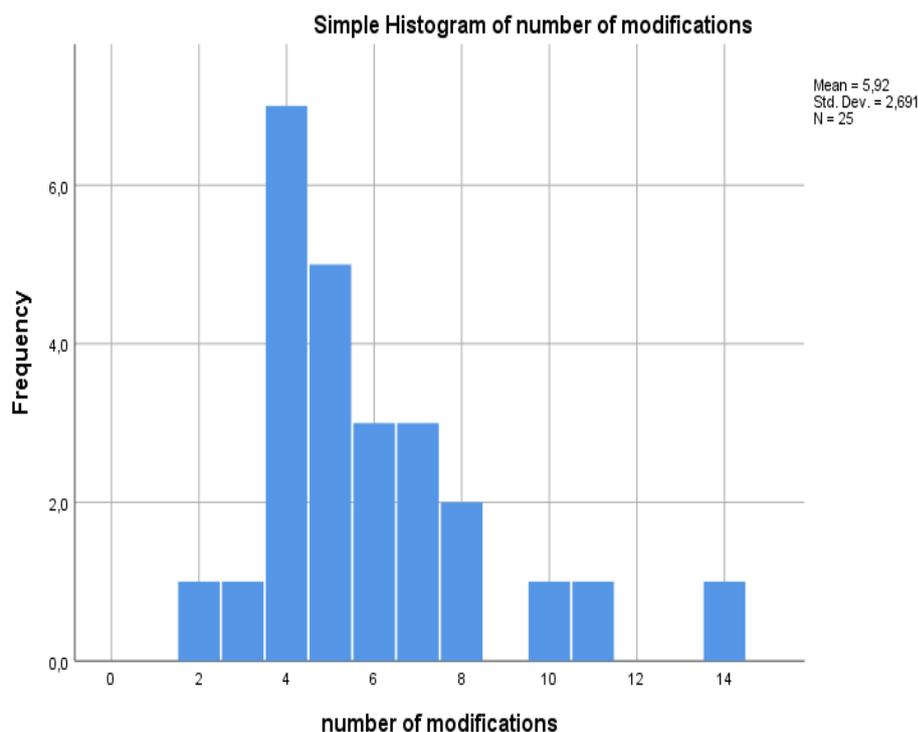


Figure 13. Pre-intervention number of accommodations for the student-case.

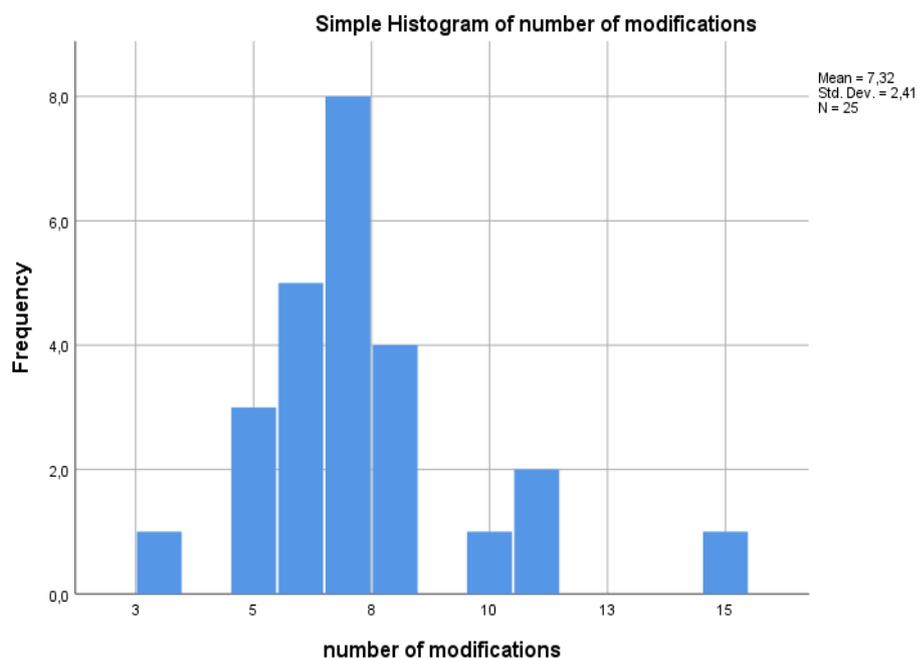


Figure 14. Post-intervention number of accommodations for the student-case.

The measure of teachers' responses in how to adjust the learning environment according to a student with special education needs and in the three domains from Küller (1991) demonstrated changes. All areas were improved, i.e., the number of accommodations rose from their initial values. In Table 7–9, the results from pre- and post-intervention are presented.

Table 7. Number of accommodations in teachers' responses in the physical domain of the learning environment, pre- and post-intervention (Leifler, 2020).

Outcome variable	Preintervention	Postintervention	Difference
Classroom organization	9	10	+1
Placement	7	15	+8
Stimuli sanitizing	15	20	+5
Prepared facilities	5	7	+2
Small group arrangement	8	11	+3
Multi sensorial tools	2	3	+1
Retreat room	–	3	+3
Cantina support	–	1	+1
Total	46	70	+24

Table 8. Number of accommodations in teachers' responses in the pedagogical domain of the learning environment, pre- and post-intervention (Leifler, 2020).

Outcome variable	Preintervention	Postintervention	Difference
Individual schedule	12	12	–
Placement	7	8	+1
Clear instructions	12	14	+2

Structure	10	13	+3
Compensatory aids (computer, time help aids, audiobooks)	15	21	+6
Routines	7	9	+2
Visual support	15	18	+3
Break possibilities	8	15	+7
Concrete material	2	2	–
Visual learning	3	3	–
Adjustments in tasks	12	17	+5
Preparation/transitions	5	13	+8
Repetition for working memory	1	7	+6
Reward system	–	4	+4
Classroom organization	1	2	+1
Positive reinforcement		1	+1
Total	110	159	+49

Table 9. Number of accommodations in teachers’ responses in the psychosocial domain of the learning environment, pre- and post-intervention (Leifler, 2020).

Outcome variable	Preintervention	Postintervention	Difference
Friendship support	9	11	+2

Encouragement	2	2	–
Recess activities	6	8	+2
The whole class values	5	6	+1
Support peer – group	4	12	+8
(Teacher makes careful decisions)			
Relation teacher–student	3	12	+9
Social codes instruction	1	3	+2
Social stories	7	7	–
Transition support	4	7	+3
Greetings – confirmation	–	2	+2
Positive reinforcement	1	9	+8
The students’ interest	–	2	+2
Diversion – prevent outbreaks	–	3	+3
Total	42	84	+42

The NDC AI (study II), the intervention towards teacher knowledge and self-efficacy are opportunities in the learning environment (research questions for this study). The professional development program is a way for general teachers to gain broader competence and can therefore be seen as also answering the overall research question about effective inclusive interventions for the Swedish school context. Regarding obstacles, the results show that school managements seldom provide their general teachers with special needs professional development and time and resources are deficient. In addition, the poor general knowledge of NDC is a considerable obstacle and hinders inclusive education.

5.3 STUDY III—SSGT

The objective with study III was to explore social validity from social skills group training. The research questions were aligned with the theories from Wolf (1978) and categorized into

satisfaction, acceptability and feasibility. The study therefore answers the questions about which interventions are effective in improving educational inclusion in the Swedish school context. Results from all participants were synthesized and pooled (findings represented in Table 10). The pooled results demonstrated *Facilitators* as the school was a safe and practical setting for social skills training, the themes for group discussions were adequate and valuable for the adolescents and teachers as well as adolescents gained more concrete tools to handle social interaction and activities. The self-awareness had a two-fold effect—where adolescents became more aware of their own behavior in social situations and the teachers became more aware of what can be challenging for the students. Moreover, one side-effect was enhanced school attendance, as described by one adolescent, “*my new friends are the reason for me that I now come to school*”. The category *Barriers* in the findings were, e.g., time, resources, inflexibility and the adolescents sometimes had a hard time in understanding the tasks in the training. Findings sorted under *Social behavior change* were new friendships and strengthened friendships and also less loneliness, and the whole school’s social environment was described as developed and as having more interactions. The school management expressed how students spent time after school, which they had not seen before. The last categorization of pooled findings is *Implementation*, where the school was described as a feasible location for the training due to factors like being close, no time to travel, no waiting list, safe environment with trust in the teachers conducting the training, and the skills were described as having spread to other school personnel who were not at the time active in the intervention.

Table 10. Thematic analysis, pooled landscape of social validity.

Social validity	Barriers	Positive indicators	Implementation	Behavior change
	Time aspects	Safe environment	Trustful environment	Improved social environment
	Unclear assignments	Adequate and valuable themes	Reciprocal relationships teacher–student	Strengthen relationships
	Lack of flexibility	Enhanced self-awareness and well-being	No waiting list	Enhanced school attendance
	Resource-demanding	New concrete tools	No extra time to travel	Less loneliness

	Similar difficulties in the group	Enhanced participation and social interactions	Generalized knowledge among staff	More knowledge and awareness at the whole school
	The wish for continuing with the training and in more settings	Individual as well as group changes	More tools to handle bullying or conflicts at school	Reduced speech anxiety, improved communication skills

The SSGT was described by all participants as valuable and feasible in a naturalistic setting, such as the school environment. Traditional approaches to social skills training typically involve practitioners delivering the training in clinical settings. However, in this study the training was conducted in school and that approach was particularly highlighted as satisfactory. The overall social climate at school was described as improved not only for the participating adolescents but also others. Furthermore, there were descriptions of generalization since the knowledge base of social impairments and strategies/methods for enhancing inclusion were spread among teachers. In the study, we represented social validity by the main categories from Wolf (1978): satisfaction, acceptability and feasibility with further underlying categories—barriers, positive indicators, implementation and behavior change. The full thematic landscape for pooled findings is presented in Figure 2, page 11, in article 3 (Leifler et al., 2022). In the section below in Table 11, I present the results from each participating group (not pooled), with some additional citations from the adolescents not included in the article.

The results derived from teachers' responses are more tools to help understand students' social impairments and to implement in the social environment, students' attendance in school was improved and there was evidence of enhanced social involvement in and outside the school. In the answers from teachers were aspects of democracy and the right to belong and participate in school settings. They believed social skills training to be important for students with difficulties within the social area, as without explicit training they saw more conflicts and misunderstandings in school as well as fewer interactions.

The school management saw the intervention as feasible in a school setting, however not without a lot of planning at the initial phase and with additional resources. They believed the staff need appropriate skills to implement and conduct the training, and this is time-consuming and sometimes difficult to fit in the busy school agenda. In the future they hoped for less rigorous interventions, since they saw large improvements in the social environment. The principals described the changes among adolescents as considerable—in individuals this was seen as changed body language and engagement in conversations, as well as in the larger group and among all students in school. Furthermore, the principals saw improvements in

students' well-being and school attendance. The skills developed by the teachers were spread among school staff and had indirect side-effects for the psychosocial environment.

Table 11. Complete set of themes identified from SKOLKONTAKT, the training group.

Responders	Barriers	Positive Indicators	Concrete notable behavior change	Implementation
Students:				
	Time aspects	Self-awareness	Developed friendships	Safety and trust in the school environment
	Unclear aims	Safe environment	Skills for conversation	Continuous training is good
	Unclear weekly assignments	Valuable group discussions	Turn-taking skills	Regularity is good
	Difficulties to relate	Support from the group	Improved well-being	No extra time to travel
	Homogeneous groups	Goal focused	Social life outside school	No waiting list
	Too few warm-up activities	Less loneliness	Tools to handle bullying	
	Need more training	Improved self-confidence	Less social anxiety	
	Too little interaction	For future studies	Increased school attendance	
	“One size fits all”-activities	Valuable practicing	Increased independence	
		Good to be challenged	Express my voice	
		New positive thought patterns		

Strengthen relations
 Reduced speech anxiety
 New social behaviors and understanding

Teachers:

Resource-demanding	Concrete activities	More conversations and laughter	The school environment is suitable for training
Time aspects	Real-life practice	Open-minded and relaxed students	School is a safe environment
Broad content	Safe environment	More friendships	Possibilities to stretch the youth because of the reciprocal relationship
Lack of flexibility	Adequate group discussions	Large individual positive changes	Valuable with continuous feedback from researchers
When digital	Enhanced teachers' awareness	More open social environment	Manual-based is good for less experienced teachers
Theories and the psychoeducation	Improved social environment	More rapid social development in the school	A big need of social skills training
Homogeneous groups	Collective group support	Increased trust	Part of the school curriculum
Too few warm-up activities	Students' self-awareness	Enhanced interactions	
Relate issues	New skills for conversation	Network with students	
Trust to participate	The regularity		
Unclear weekly assignments	Goal-focused		

Encouragement	The whole schools' improved social environment	Less stigmatizing in the school environment
Specific autism knowledge		No waiting list
Enhanced well-being	Teachers' increased self-satisfaction	
Preventive for bullying	Visualization of students' needs	
Strengthen relationship teacher-student	New teaching methods	
Less loneliness		
Enhanced academic achievement		
Students' self-confidence		
Growth mindset		
Conflict prevention tools		
Enhanced participation		
The structure		
The right to belong		
Future skills for employment		

School management:

Time aspects	Safe environment	More interaction	Evidence-based - less trials
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Preparation	Enhanced participation	among students	Bottom-up perspective
Initial phase with the education of staff	More tools for social skills training	Enhanced well-being	Improvement wishes for autistic students
Resource-demanding	Social activities after school	Changes in body language	Large need among the students
Broad content	Enhanced cohesion	More conversation skills	Part of the schools' responsibility for democracy and social inclusion
Extra costs	Improved teacher knowledge	Increased awareness among teachers	Possibilities to apply for financial support is important
Lack of flexibility	Open-up and problem-solving effects	The collective teacher efficacy	Deep knowledge – no quick fix
	Less loneliness		The whole school -approach
	Conversation skills		Co-operation with researchers – important with transparency
	School subjects seldom integrate social skills training		Continuous feedback is important
	Preventive for school absenteeism		Researchers need to understand the school environment and what is feasible
	Self-awareness		
	New teaching methods		
	Generalization – the knowledge will stay and be spread in school		

Note. Themes that were associated with a larger number of text units are shown in bold.

The results from the adolescents confirmed satisfaction and acceptance of the program. The adolescents expressed enhanced self-awareness and were glad for the opportunity to practice challenging moments in their naturalistic environment. They felt safe in the school setting and some of them would have liked to practice the newly adopted skills even outside the group. Concrete changes in behavior after the program were, e.g., reduced speech anxiety, more social interactions and communication skills, thinking trends and new friendships.

5.3.1 Citations from the ADOLESCENTS

The participating adolescents described more bridges than barriers after the social skills training. They showed satisfaction with the program. Citations from five participants are presented below (for further citations, see Leifler et al., 2022):

“I liked the discussions best, they were great, I know I have difficulties when talking and discussing things with people in my age, I learned how to talk about different things and share my thoughts and feelings, I have been afraid of sharing my opinions before, I know this is difficult for me.”

“If this was valuable for me? I would definitely say yes, ahh, mostly it is that we have contact. That I now have contact with somebody or some and we can talk about important things, to get support without having to, ahhh think that much about what others think, it can be similar issues in this small group, I think you often feel very lonely with your thoughts, and then you experience that others feel the same or have similar issues.”

“The main themes in the discussions were good, it was about things young people think a lot of and might worry about. When talking about it in a group, and discuss how you feel and what you have done, you don’t feel as lonely, and that creates calmness, that it is not that hard. You are not as lonely in your thoughts.”

“Advantages with social skills training in school? If I compare with outside school, the advantages is that it is very available, you don’t have to hassle with remiss to a place and waiting lists and things like that, and I think it is good if you have difficulties in getting friends in school. The training gives you a ground, and some people that you actually have talked to, you can talk to the people in your group.”

“For the first time in my life I had some friends coming over to my birthday party. For me it was a life-safer. I am not sure if I would have made it without them.”

The summarized results based on the completed interviews ($N = 20$) show high levels of satisfaction. Likewise, teachers as facilitators seems to be particularly beneficial for generalization. According to the responses, the school setting is beneficial for several reasons: the closeness, typically developed peers to interact with and develop friendship, the environment is less vulnerable even though teachers and students have a relationship. Students ($n = 13$) expressed enhanced social skills, where students in the training group expressed broader and more detailed improvements. The school management ($n = 2$), saw

overall improvements in students' social skills and believed the training had a natural part in the agenda in school. However, according to facilitating teachers ($n = 5$), the training is time- and resource-consuming and that has to be taken into account when implementing the intervention.

The social validity of social skills group training (study III) answers questions also from study II, questions regarding opportunities and obstacles as well as effective interventions for the Swedish school context. Improving social skills must be seen as a core component for children with NDC in mainstream school settings. The social skills group training can be implemented with extra resources. An obstacle regarding this is nonetheless tight school budgets and lack of time. Another obstacle is schools not being able to prioritize social skills interventions, which was described by participating teachers as common in regular schools, with lack of time and concurrent pedagogical content.

5.4 STUDY IV—INCLUSIO

This study aims to answer the question about strengths and weaknesses in the learning environment from a comparative perspective. The objectives were to explore inclusive education through applying the implementation of inclusive measures from the instrument INCLUSIO and search for the views of students with NDC as well as the views of their caregivers and teachers.

The results based on the completed interviews ($N = 53$) show supporting and hindering areas in the school environment. According to the responses, the initial phase where the students' needs are analyzed and documented show more similarity where there is a discrepancy in other areas, e.g., direct instructions and individual support, available resources and the responsibility in creating more inclusive strategies, i.e., support in the social environment. In line with our hypothesis where we believed in limited consensus among groups, the total score of all INCLUSIO items was higher in teachers than in both students and parents ($p = .001$). Caregivers and students express lack of sufficient support in the explicit classroom situation with tasks and assignments. Students' ratings on inclusion success were information exchanges and visual support. Students' ratings on poor areas were preparations for unstructured social situations and information about changes in advantage. Teachers as well as students expressed the social environment as a neglected area of inclusion reality. Furthermore, students, parents and teachers expressed weaknesses in teacher competence and the whole school approach for common values of inclusion. Table 12 presents the summarized results for answers (yes and rather yes), indicating existing areas where educational inclusion has its strengths and weaknesses.

Table 12. INCLUSIO results by subscale/item in % of positive indicators of inclusion domains in the whole sample ($n = 19$ students, $n = 17$ parents and $n = 17$ teachers)

Item/subscale	Positive indicators (yes, rather yes)		
Responder	Students	Parents	Teachers
<i>Assessment of support needs</i>			
Recommendations from clinical services are used for support planning	58 %	24 %	59 %
There is a specific and accessible support plan document (IEP) and support plans are followed up on and evaluated	37 %	24 %	59 %
Staff involved in support plans meet regularly	79 %	47 %	76 %
<i>Use of individualized support</i>			
Students are offered alternative options to demonstrate knowledge ^{a*}	89 %	65 %	100 %
School rules are adapted to student's needs ^{b*}	47 %	59 %	82 %
Students receive the individual special education support needed	53 %	47 %	76 %
Everyday individual adaptations in the classroom and schedule are provided	37 %	41 %	88 %
<i>Implementation of a structured learning environment</i>			
School uses visualization of schedules and time ^{c*}	53 %	29 %	53 %
Students are offered organizational aids ^{d*}	32 %	24 %	76 %
Changes to procedures are communicated to NDD* student as early as possible	21 %	53 %	53 %

<i>Individual changes applied to teaching</i>			
Students' interests are integrated in teaching	37 %	24 %	41 %
Strategies for handling stressful situations are provided	37 %	5 %	71 %
<i>Functional response to behavioral characteristics</i>			
Staffs get time to discuss NDD student's behavior and support plans	47 %	29 %	76 %
School offers space for rest and withdrawal	63 %	59 %	71 %
<i>Cooperation with parents</i>			
There is mutual exchange of knowledge about the student with NDD between home and school	63 %	53 %	65 %
School uses caregiver's knowledge to optimize support	37 %	65 %	59 %
There are regular exchanges between caregivers and responsible staff around the student with NDD	58 %	59 %	59 %
<i>Consideration of peer-relations</i>			
In case of group-work, the composition of the group takes into account knowledge of the student with NDD	32 %	29 %	88 %
NDD students are prepared for unstructured social situations	21 %	35 %	47 %
<i>Staff education/professionalism</i>			

The school staff has basic knowledge of NDD	26 %	12 %	47 %
Staff understands that individualized support might be necessary for a given student with NDD	58 %	53 %	82 %

Note. *Items are translated from Swedish and shortened for reader's ease and summary presentation; a allowed to present orally instead of in written form, or vice versa; b can spend breaks in classroom; c provide time-timers, visualized schemes; d checklists, planning aids.

* NDD neurodevelopmental disorders

The results based on the completed threads show areas of alignment as well as areas of discrepancy in responses. Schools have a structure of how to map, document and talk about the support and needs of the child, but later there seem to be difficulties in implementing the support in the learning environment. The parent and child more often share the same view, where the child carries a big responsibility. Having this responsibility, students themselves need to ask for help and handle the school's social environment. Support in the social area of the school environment seems to be a neglected area. The teachers are sometimes unaware and not involved in the planning of the students IEP. Teachers do not know if all professionals can take part in the plan of support and if IEP is shared in-between the school setting. Furthermore, the relationship between the student and the teacher plays a crucial role in well-being and school attendance. This was described by the students as some teachers seem to have the understanding and knowledge for adjustments in the learning environment where others do not. The inference analysis demonstrates differences among the evaluation of the learning environment between participating groups. Several of the items had negative to no agreement ($r = -.21$ to $.00$), 12 none to slight agreement ($r = .01$ -. $.20$) and one fair agreement ($r = .28$, $p = .001$) [*"The school staff has basic knowledge of NDD"*]. The results show discrepancies in most of the areas of the learning environment, where the lack of basic knowledge is one of the few exceptions where students, parents and teachers agree. The largest areas of discrepancy between teachers versus students and parents were with the following items: everyday individual adaptations in the classroom and schedule are provided, students are offered organizational aids, strategies for stressful situations are provided and when organizing peer and group work, attention is paid to students' social impairments. In summary, teachers evaluated the learning environment to be more inclusive than students and parents in just above all areas of practical inclusion.

There were significant correlations found between some of the items and the total INCLUSIO measurement. In the whole group, all INCLUSIO domains correlated highly ($\geq r = .64$) with the total score, and the domain *Use of individualized support* demonstrated highest association ($r = .85$, $p < .0001$) with overall inclusion scores. Correlations between the INCLUSIO total and specific variables in the responses from students were significant in the following: *individual support* ($r = .75$, $p < .000$), *functional response to behavioral*

characteristics ($r = .70, p < .001$) and *individual changes applied to teaching* ($r = .64, p < .003$). For parents and the INCLUSIO total there were significant correlations in *individual support* ($r = .91, p < .000$), *a structured learning environment* ($r = .88, p < .000$) and *functional response to behavioral characteristics* ($r = .82, p < .000$). Correlations in the INCLUSIO total and teachers' responses were *functional response to behavioral characteristics* ($r = .85, p < .000$), *individual support* ($r = .83, p < .000$) and *cooperation with parents* ($r = .78, p < .000$).

In the last and fourth study, the questions about bridges and barriers for inclusion are answered as well as the question about areas of strength and weakness from a comparative perspective. The overall conclusion from this study is that there is a discrepancy among how inclusion is perceived in reality by different stakeholders. This is in line with the previous investigation with the same instrument, INCLUSIO (Bölte, Leifler, Berggren, & Borg, 2021). In the first investigation, school leaders evaluated the inclusive learning environment for students with NDC as working better than teachers and other personnel. In study IV, the teachers ranked the environment as more inclusive than students and parents. These discrepancies can be seen as an obstacle when planning for and providing support to students with NDC in mainstream school settings. Areas of strength from the results in study IV are cooperation between parents and teachers and that evaluation and planning for students' needs are working relatively well.

5.5 SYNTHESIS

The overall aim with this research was to contribute to the understanding of educational inclusion for students with NDC in mainstream school settings. The compilation thesis has four separate articles, which together answer the overall research questions. Each of the studies have results linked to their specific research questions, leading to answering the overall research questions: how to understand inclusion from a multi-stakeholder perspective and how educational inclusion is working in practice. In the following section, the summarized results are presented in four main themes. Moreover, the results from each study are presented in how they relate to their specific underlying research questions. The key findings are further presented in regards to actions and challenges in Table 13 at the end of this section.

The synthesized results from the four individual studies show that there are certain aspects of educational inclusion for students with NDC that are critical to discern in order to be able to understand inclusive education in practice. These aspects are important to highlight to give more attention to relevant aspects of inclusive reality and how they can affect students' experiences in school.

The results from the four empirical studies have been brought together with the knowledge domain of educational inclusion for students with NDC in order to identify the key elements that are important to address in the process of analyzing and designing inclusive learning settings. The identified key elements are:

1. The psychosocial environment can be adjusted more adequately by certain interventions, i.e., social skills training for students, interventions for enhancing teacher awareness and self-efficacy and evaluating this domain of the learning environment more frequently.

All four studies show that despite supposed knowledge of social impairments associated with NDC, this area was not sufficient nor treated enough in school settings for meeting the needs of the students. In study I, there were few accommodations in the psychosocial domain, and in study II, the teachers realized this was an overlooked area and saw the benefits for students' educational inclusion when provided with support. In study III, all participants (students, teachers and the school management) highly valued and expressed change and enhanced participation in the intervention towards the social environment. In study IV this—the items linked to the psychosocial domain of the school setting—was an area with large discrepancy. The discrepancy was that teachers believed this domain was working well and that students were provided with enough support. However, being included means more than being physically integrated in the classroom and school environment. The findings make it clear that not enough suitable preparations or adjustments exist in the content base or the practical dimensions of inclusion. In this micro-perspective of inclusion, the preparation of the contents of teaching materials, e.g., tasks, instructions, assignments and tests, is lacking, and at the same time, there is a shortage in the social environment where students were seldom prepared for social interactions and activities.

Results from study I illustrate evidence-based interventions targeting the social environment are possible to conduct in mainstream settings. However, they are still understudied, maybe more so in Swedish school contexts than internationally. The lack of participation and being part of all domains in the school environment was particularly seen in this research, e.g., in study IV, where students in higher grades' needs were insufficiently met. The students were very much left alone when trying to handle the social environment. The students are not provided with strategies for handling unexpected social activities, are not prepared for social events and interactions and participate to a lower degree in this domain of the learning environment. There are seldom adjustments and preparations for peer and group work, where the students have more difficulties and which is therefore seen as an obstacle to learning. Teachers' awareness of this is brought to attention when taking part in an intervention for inclusive strategies and skills. Special didactics are needed in order to observe, analyze and prevent hindering activities in the classroom, which is designed for learning, but which however is not available for a group of students. In the first study, there were some innovative approaches aiming to improve the social environment and individual social skills. However, there were no studies with the objective of improving well-being among students. This is in line with the second study, where teachers themselves brought attention to how seldom they worked with raising and improving the class's social environment or building self-esteem and trust in children. Furthermore, they saw improvements when helping individual students have a better social status in the classroom social hierarchy. The results from study II showed the largest increase in teachers' readiness to prepare the psychosocial

environment after the intervention. In study III, the social skills group training helped students in various ways. Many of the students had been bullied and socially excluded before, and for some of them, they felt included for the first time. The teachers gained broader knowledge and enhanced skills in understanding social impairments as well as tools for creating better social environments at school. Systematically implementing social skills interventions in school settings, e.g., social skills training or staff training, can increase educational inclusion. Intervention with the aim of improving social skills and better social climate is generalized and spread among teachers and students. Results from study IV show similar results where the students seldom felt the learning environment was prepared to meet their social difficulties. The students experienced little preparation for unexpected or expected social activities in school. There were students who expressed and explained part-time absences due to social challenges, i.e., where to spend time in between classes, at recess-time and at social events. In the psychosocial domain, there were also expressions of the importance of a well-working student–teacher relationship. In perceptions from the adolescents, teachers were more or less skilled in meeting, understanding and responding to their needs. Teachers with inclusion skills were described as good listeners, understanding what is and can be difficult in the learning environment, and at the same time believing in the capability of the student.

Moreover, the students themselves were seldom involved enough in the planning or evaluation of the support. In summary, knowledge of social impairments and how to prevent and implement interventions with the objective to improve the social environment can develop, upgrade and enhance educational inclusion.

2. Teachers need certain knowledge of special didactics based on knowledge of NDC and how to transform theoretical knowledge into practice. A structured learning environment covering all students' needs is not sufficient enough for educational inclusion, where support for individual needs is a more powerful way towards improved educational inclusion for students with NDC.

Preparing the learning environment for all students without explicit knowledge of neurodiversity and diverse needs leads to less inclusion. In the systematic review, the learning environment can be accommodated with a focus on improving functioning and academic achievement for students with NDC. The results from study IV show individual support as the most essential factor for inclusion for the students. Students were not provided with one of the most essential scaffolding structures for individuals with NDC, organizational aids. Individual support and varied interventions in order to help students within mainstream school setting increases educational inclusion as found in study II. Teachers in study II knew general methods and strategies for good teaching, a structured learning environment and general students' learning, nevertheless, on the other hand, they felt less competent in meeting the needs of children with NDC. Knowledge of how to provide best opportunities for learning for all children and youth is more possible and feasible when combining adjustments and accommodations in the learning environment with modifications and individual support

for specific conditions or disabilities, such as the intervention in study III. Results from study III show benefits for inclusion when approaching individual impairments and needs not met through a structural learning environment. Results from study IV demonstrate low special didactics knowledge, where the content in the classroom was seldom adjusted and modified for improved learning for students with NDC. Teachers' special didactic knowledge is based on all students learning, and thus educational inclusion can only be provided with additional knowledge of the characteristics of students with NDC. The specific knowledge needed is how to prevent impairments in executive functions, where tasks, assignments and classroom activities are adjusted and complemented for students with such as checklists, working-guides or explicit instructions. The most valuable inclusive skill for teachers for enhanced inclusion is knowing how to adequately support students with NDC holistically, which is within the physical, pedagogical and psychosocial environment. The skills of inclusion will be developed by having a base knowledge in theory and in the medical aspects of the disability and thereafter evolved by having a strong sense of knowing how to do it.

3. General teachers need more competence in order to fulfill inclusion goals and better inclusion reality. The competence needs to especially target the didactics. The art of teaching can be based on general didactics, e.g., pedagogical content knowledge, but teaching for diversity has to shed more light upon learners' characteristics and students with more complex needs. Special Needs Education with expert knowledge, e.g., special needs teachers and coordinators, is not enough for educational inclusion for students with NDC. Collaboration between professionals in schools and students' welfare teams is a prerequisite for inclusion, but nevertheless not a guarantee for adequate teaching or sufficient support in the classroom in practice.

In study II, the teachers were supported with special needs coordinators, but nonetheless felt insufficient and not competent enough to teach students with NDC. The intervention, NDC AI, increased inclusive skills and self-efficacy and furthermore developed the schools' inclusion values. The whole school approach, where all personnel develop competence of a specific disability or condition, provides educational inclusion more adequately than expert knowledge among just a few. When support is not a collaboration, it is an obstacle to inclusion, and an example of this are the findings from study IV, where some teachers did not know if the student had an individual educational plan nor the details of the support needed for the student. Support for students with NDC in mainstream school settings is not fully met when provided only by special needs education from personnel with extended knowledge. General teachers need knowledge of children and youth with SEND in order to provide educational inclusion. The SEND has to be identified and shed light on for proper preparations of the content in teaching as well as in all activities in school. Results from the literature review furthermore show that interventions and evidence-based methods for students with autism are mainly implemented in clinical or segregated settings. Training general teachers to implement evidence-based methods and teaching strategies for students with NDC generated better teacher self-efficacy in study II, which was a catalyst for action. Results from study II, III and IV show that knowledge related to NDC, a common discourse

or a meta-language about special educational needs and diagnoses show better educational inclusion and more initiatives among teachers to improve and re-cultivate. Results from the studies show that general teachers lack the meta-language for special needs and special education. The common special inclusive education language is the approach for understanding and knowledge generation. The results from study II and IV demonstrate that teachers have low general knowledge of NDC, and what stands out clearly is that there are problems in how to adjust and accommodate SEND in practice, i.e., with concrete tasks and assignments, how to build relationships, strategies for handling challenging behavior and prevent for impairments with executive functions. The questions for teachers in study IV were sometimes “an eye-opener” for the teachers, where they realized that their student might need something additional or extra, i.e., support in- and outside the classroom.

4. Research-based interventions and evidence-based methods with specific targeting areas are far more needed and have to be implemented in mainstream school settings to provide educational inclusion. Results from all four studies show lack of direct interventions or accommodations in Swedish mainstream school settings.

Students in study III had experiences of social exclusion, and the social skills group training provided students with skills essential for taking part in all activities in school and therefore learning, as well as skills for participating in society. Social skills group training or individual social training for all students or students with NDC is rare in Swedish school settings. In study I, there was a large number of interventions excluded from the synthesis due to having the wrong setting, as interventions for autistic students were mainly conducted in clinical or segregated school settings like special units and special schools. Teachers in study II had the opportunity to collaborative professional development, where the focus was on special didactics and evidence-based methods for supporting students with NDC. The teachers had not implemented or tried several of the strategies and methods demonstrated in the intervention. Findings from study IV showed a lack of implementation of well-known strategies or methods valuable for students with NDC, i.e., preparing for social activities, information in advance especially when there are changes in the school environment, scaffolding systems for task engagement and achievement, as well as strategies for motivation and strategies for handling unexpected events.

The last key element is aligned with the three first elements and summarizes and bridges the overall result, where the holistic view of educational inclusion is in focus. Interventions such as social skills training is not frequently implemented, and therefore there are fewer opportunities in Swedish mainstream settings for teachers to gain more knowledge of learners’ characteristics. Training teachers to implement evidence-based methods like in study II develops teacher self-efficacy and inclusion skills. In this view, all teachers—not only the special education professionals—need to continually develop their skills. If teachers are trained to implement social skills interventions or participate in professional development, their knowledge is generalized and leads to more specific knowledge of impairments associated with NDC. This knowledge is needed to prepare the learning environment

adequately and sufficiently. Interventions for students with NDC can be implemented in general school settings. Interventions for general teachers, implemented in regular classrooms, enhance inclusive education for students with NDC. Professional development focusing on special needs education is seldom provided for general teachers, but more often for special needs teachers and coordinators (findings from the additional study by Bölte et al., 2021a, and study II), who are supposed to supervise the personnel. However, this approach shows its weaknesses in the results of this research. For satisfaction and acceptable school inclusion, there is a need for broader competence and far more interventions and methods with distinct focus on impairments associated with NDC. Teachers in study II expressed the great value of gaining more knowledge of evidence-based methods valuable for students with NDC. Some of these methods are the essential basis for educational inclusion for students with NDC in mainstream school settings. Some of the students in study IV did not have knowledge of their own learning strategies, metacognition or strategies for planning and memorizing. Distinct impairment with executive functions associated with NDC have to be further explored by implementing interventions targeting this area in Swedish school settings (more common internationally, as seen in study I). Overall results show discrepancies in how teachers are ready to teach for diversity, depending on several factors described above, and thus one common statement is that prerequisites are not satisfactory, e.g., not enough time to prepare, not enough time for professional development, not enough time for collaborative teacher cooperation and efficacy and in general lack of knowledge of neurodevelopmental conditions.

When all results are analyzed in relation to each other, the following factors appear meaningful for applications of inclusion in practice:

- Teachers want more and need more explicit knowledge of NDC, where an essential part of that knowledge has to be practical, namely how to adjust didactics in the classroom contexts. This can be provided with professional development.
- Teachers are aware of their shortages in how to provide educational inclusion for students with NDC, where the shortage is a threat to inclusion as well as teacher satisfaction, but this still leads to the situation where students with NDC are seen as something special that someone with special competence can or should handle. General teachers need explicit knowledge of different special education needs.
- Interventions and accommodations are to a large degree conducted in special educational settings, which means included students with NDC are overseen and not provided with as many opportunities for better learning, possibly due to a combination of lack of explicit knowledge and traditions of not talking about the disability to avoid stigmatization. Implementing direct interventions provide better educational inclusion.
- Teachers estimate the learning environment as more inclusive than parents and students in several areas of the school setting, where the social environment is especially overlooked and students with NDC are not prepared for, supported with or adequately included. Evaluating the learning environment from different angles and

the perspectives of different stakeholders is important for the way forward and how to work towards inclusion.

- Students appreciate possibilities to practice social skills and improve their individual impairments in the school setting. The whole school's social climate can improve when implementing social interventions in school settings.
- Teachers develop valuable inclusive skills after direct interventions with focus on students with NDC.
- There is a lack of collaboration between different professionals within and outside the school. Collaboration and inter-professionalism have to work better in order to provide better learning.
- Parents and students estimate individual support as the most valuable support in the classroom context. Individual needs have to be met for high-quality educational inclusion.
- Parents have several negative school experiences and still have to strive and fight for sufficient support for their child. Listening to the parents provides opportunities for better individual support.
- Students feel the responsibility is often theirs, in asking for and highlighting the need for help in the classroom context. They sometimes feel they are disturbing the busy teacher. Collaboration between staff can develop further in Swedish schools.
- Students estimate teachers' inclusion skills differently, where teachers have more or less ability in understanding and meeting their individual needs.
- A broad repertoire of special didactics skills provides better educational inclusion for students with NDC.

The second overall research question—how does educational inclusion work in practice for students with NDC and what key elements and knowledge can develop more powerful inclusive agendas—is presented below, in both bullet points and Table 13.

- There are several poor areas in the learning environment for included students with NDC where the psychosocial domain is a particularly weak area.
- The general mediocre knowledge among personnel entails fewer opportunities for the students to reach educational goals and academic achievement.
- Some schools have established systematic methods for analyzing students' needs and documenting it properly, where also the collaboration with parents works well.
- There are schools that have implemented valuable methods for letting the students demonstrate their abilities in different ways, e.g., in adjusted assessment situations and with individual support.
- Information and knowledge from parents are seen as important and valuable for providing support for the student and are part of preparing support for students in some schools.

Table 13. Key findings, actions and challenges for developing powerful inclusive agendas

Key elements	Actions	Challenges
<p>The psychosocial environment is an overlooked area important for inclusion (findings from study I, II, III and IV)</p>	<p>Social skills interventions for groups of students (e.g., SKOLKONTAKT) as well as for individuals (single case design)</p> <p>Working on the whole school’s social culture and climate</p> <p>Build positive teacher-student relationships</p> <p>Collaboration with the student welfare team and the teachers in new ways</p> <p>Training paraprofessionals to become inclusive agents</p> <p>Enhancing NDC awareness at class- and school-level</p>	<p>Finding time in schools’ busy agendas (study II and III)</p> <p>Prioritizing the content, content that is competitive (study III)</p> <p>Personnel knowledgeable enough (study II, III and IV)</p> <p>Take into account the risk of stigmatization and feeling of otherness (study III and IV)</p> <p>The structure of schooling, where professionals seldom collaborate (Study IV)</p> <p>Resource-demanding (study III)</p>
<p>Support for individual needs in the learning environment (physical, pedagogical/didactical and psychosocial accommodations) have to meet the specific needs of children with NDC (findings from study II, III and IV)</p>	<p>Implement and try out comprehensive models and interventions for students with NDC in the Swedish school context</p> <p>Evaluate the learning environment holistically, e.g., with instruments such as INCLUSIO</p>	<p>The need for broad competence (study II and IV)</p> <p>Time for evaluating and implementing strategies, methods, interventions and comprehensive models (study III and IV)</p>
<p>General teachers need more competence in order to fulfill inclusion goals and better inclusion reality. General teachers need the</p>	<p>Professional development for all personnel</p> <p>Workshops close to practice where teachers reflect, learn and implement support for</p>	<p>Changing teachers’ mind-set that some students can and some students cannot at the same time as talking and</p>

<p>“know-how” (findings from study II and IV)</p>	<p>students with NDC, e.g., the NDA AI program or similar</p> <p>Implement, evaluate and refine the new goal in teacher curricula regarding NDC</p>	<p>highlighting disabilities (study II)</p> <p>Changing the approach and responsibility from where the child owns the problem to understanding that the problem occurs in the learning environment if this is not adjusted enough (study II and IV)</p>
<p>Research-based interventions and evidence-based methods with specific targeting areas are far more needed and have to be implemented in mainstream school settings (findings from study I, II, III and IV)</p>	<p>Find innovative ways of collaborations, in- and outside schools between professionals</p> <p>More opportunities for schools to search for funding to implement interventions</p> <p>Spread the knowledge, find new ways for schools to work with experts during their passage to more competence, improvements in the interdisciplinary staff collaboration, e.g., SKOLKONTAKT and similar programs.</p>	<p>Change the way of how we look at the categorization of children</p> <p>Understanding of neurodiversity, the approach “one model fits all” (study II and IV)</p> <p>Broad competence within schools is needed, knowledge about evidence-based activities and how to implement these (study I, II, III and IV)</p>

6 DISCUSSION

The overall aim of this thesis is to contribute to the research on educational inclusion for students with NDC. The focus has been on practical aspects (the micro-level) of inclusion and on what knowledge is important for understanding the phenomenon in relation to neurodevelopmental diagnoses. Change towards improved inclusion involves many steps and at all levels of the social system (Bronfenbrenner, 1994, 2005). The focus area in this thesis is mainly the micro-perspective where aspects of the learning environment are linked to perceptions of inclusion. It is not realistic to believe that inclusion and improvements of the educational setting will come naturally without addressing and measuring multi-perspective perceptions with explicit attention on the individuals whose environment we are aiming to improve.

In this section, the results will be discussed in relation to previous research and with additional new knowledge and discernment and implications for practice. The discussion starts in the individual results of each study and thereafter ends in a broader discussion related to the summarized results. The summarized results indicate four main areas to direct attention to: lack of adaptations and interventions in the psychosocial environment, the necessity of individual support for neurodiversity, transformation of the special needs education to the general pedagogical agenda and the quest for implementing intervention and evidence-based methods for students with NDC in Swedish mainstream school settings.

Does the learning environment make the grade? A systematic review of accommodations for children on the autism spectrum in mainstream schools.

This study indicates that accommodations in the learning environment is a promising approach, and for continuing to influence and develop inclusive education, the research is relevant to school practice. In the broad literature of inclusive education and neurodevelopmental diagnoses, the practical and didactical perspective is often overlooked. The didactical question *how* is needed in order to create inclusive learning environments. Results from study I demonstrate that for the pedagogical domain and autistic students' learning, behavioral strategies, scaffolding, writing instructions and computer-based programs are effective. These accommodations and the support address executive dysfunction, overlapping deficits in ASD and ADHD. For functioning in the school setting, interventions involving peers and supporting personnel, i.e., paraprofessionals, are one approach towards a qualitative inclusive environment for autistic students. These promising approaches can be presented for in-service as well as pre-service teachers. The interventions identified in this literature review convey the importance of variety and of the holistic lens of inclusion, where not only physical placement nor academic achievement is in the center. The ICF Core Sets for individuals could be used as an assessment tool in educational settings for a more holistic view of the environment. The ICF can capture individual aspects as well as environmental aspects. However, the original ICF framework comprises over 1600 categories of health-related functioning aspects, where the shorter versions, the core sets, might be more

appropriate for educational settings (Mahdi, 2019). Previous research highlights the difficulties for teachers to implement inclusion methods in practice (Hume et al., 2021; Parsons et al., 2013), and the results from study I can contribute to Swedish school settings, where especially the interventions for enhancing the social environment can be implemented.

Teachers' capacity to create inclusive learning environments.

The second study examined whether teachers' self-efficacy for teaching diversity was enhanced after a short professional development program. The second study suggests that if general teachers become more knowledgeable of special needs education and diverse needs, the educational inclusion for students with NDC is improved. Research on potential stressors for teachers show that difficulty in meeting the needs of an increasingly diverse group of students with needs is a source of stress (Wisniewski & Gargiulo, 1997). Particularly, the lack of appropriate professional training is described as a threat to support and inclusion of children with additional needs. Two central areas of stressful factors for teachers are perceived self-competence and the behavior of the child. Disruptive behavior within the classroom, e.g., children that disturb peers, is challenging and hard to handle (Forlin, 2001). Another major problem for teachers is trying to prioritize the allocation of time to be spent with either one or two children with special needs or with the majority of the class (Farber, 1991). A change and progress towards improved inclusion has to take several perspectives, where enhancing teachers' knowledge is a core component. An act for "*No Child as well as No Teacher Left Behind*". There is no complete picture of how teachers view inclusion (Boyle, Topping, & Jindal-Snape, 2013), but the NDC AI program, the intervention for teachers is one way to create opportunities for teachers to develop collaborative teacher-efficacy and common values for inclusion. Based on the results, teachers developed the most in providing an improved psychosocial environment, which can promote better health and well-being for all students.

Professional development for teachers, such as the program in study II, is valuable for dualistic reasons, i.e., for all children in need of support and for their teachers serving them in the classroom. This is the trajectory since more children with NDC attend mainstream placement. Responding to all needs in the classroom, including those with complex needs, is particularly challenging. In fact, it may be one of the greatest challenges for teachers. This is overlooked by government policy and local authority and even sometimes by school management. The quest for professional development towards creating better learning for students with special needs is emphasized among a broad group of scholars and literature (Ainscow, 2003; Ainscow et al., 2006; EASNIE, 2012; Florian, 2010; Norwich et al., 2021). The school management has to prioritize among professional development for teachers, which is a threat to inclusion. Teachers not knowledgeable enough will not provide educational inclusion for students with NDC. In addition, with few opportunities for teachers to develop their pedagogical repertoire, there is a risk for teacher stress and burn-out (Norwich et al., 2021).

To meet the needs of students with high levels of complex needs can undermine the teacher's professional identity. In this case, it may be easier to blame or categorize the child as the owner of the problem, rather than examine the wider barriers, as seen in the additional qualitative data in study II (Leifler, 2020) and IV (Leifler et al., 2022). There is a need for innovative approaches for preparing both pre-service teachers and in-service teachers to work in inclusive classrooms. Ashman (2010) highlights the problem with professional learning for in-service teachers. Teachers who enroll at university are generally more extrinsically motivated and eager to apply new knowledge directly in their classrooms. The bottom-up perspective is a motor for further learning. The bottom-up perspective is seen as the most promising approach when it comes to adult learning (Dudley, 2013), however, if seriously intending to improve inclusion, education courses and programs need to reach all teachers and not only those who already have the intention to improve learning for all students. Furthermore, Ainscow (2003) argues that professional development and teachers' learning need to be context-specific and directly linked to their practice. To improve the school culture, the professional development has to be facilitated by those who strongly believe in inclusive education and can implement and spread the vision. The NDC AI had a bottom-up perspective, was close to practice and the content was to a large degree linked to *how*, how to implement inclusive strategies in the classroom. Experience and knowledge will lead to a change towards more positive attitudes of inclusion of students with disabilities in regular classrooms, and with teachers believing in their own ability to teach all students, as highlighted by Thomas and Moxley (2007), as a threat to the medical approach. Teachers need broader understanding of the strengths and weaknesses among students to develop more reflexivity in practice. Teachers need the right tools, strategies and experience to enhance self-efficacy and to try out new approaches in their classrooms. Teachers' response to inclusion from the results in study II is associated with their perceptions of the availability of training, professional development, extra resources and support.

Social skills group training for students with neurodevelopmental disorders in senior high school—A qualitative multi-perspective study of social validity.

The findings from study III (Leifler et al., 2020) indicate that social skills group training is feasible in school settings. Despite the fact that social impairments are strongly associated with NDC, there are few social interventions in the Swedish mainstream school setting. The social environment was additionally described as poor in study IV. The results from study III and IV can be used for policy planning as well as practical applications for educational inclusion for monitoring and ensuring improved inclusion. Social skills group training and other social interventions can focus on the individual or the surrounding. All micro- and meso-levels affect the child and youth (Bronfenbrenner, 1994), and a parallel can be drawn with the human environment interaction model where there is an interplay between the individual student and the peers and other persons in the social environment (Küller, 1991). The attitudes and values of others are crucial in creating a safe and pleasant social environment. Better awareness of NDC school-wide (Pellicano et al., 2014) and specifically in peers who do not have NDC are important for understanding and powerful inclusion

(Kurcharczyk et al., 2015). In school settings, it is significant to start early with social skills interventions and training since youth are more sensitive when it comes to talking about difficulties and diversity. Starting early is important in many aspects, as many of the adolescents in SKOLKONTAKT (Leifler et al., 2022) had negative experiences from social exclusion and bullying. Extending the views of normality requires sensitivity to differences between students. Being aware of the stigmatizing effects of marking some students as different is crucial when designing for social skills interventions. It might be essential and necessary to involve the student when preparing for acts and interventions of this art. Improvements in the social context in mainstream schools are extremely important to create a powerful inclusive agenda. Positive inclusion policies at schools need to encourage social integration. Innovative research in this area was found in the systematic literature review (Leifler et al., 2020), for example, the two included studies by Koegel, Kim and Koegel (2014) training of paraprofessionals to improve socializations in students with ASD and Koegel, Kim, Koegel and Schwartzman (2014) using students' interest to start social clubs. Kretzmann, Shih and Kasari (2015), also identified in the literature review, explored effects of a psychosocial intervention, Remaking Recess, for elementary school students, also involving school professionals in the intervention. Their conclusions were in support of the view that social contexts are needed to be sustainable and to improve peer interactions. Interventions of this form are rare in Swedish school settings, probably due to the lack of targeted interventions towards students with NDC, despite knowledge of the difficulties with social interactions and activities. The SKOLKONTAKT research can further be seen as informal professional development, since the teachers as well as school management described generalized and enhanced inclusion skills. The results from study I and III show that teachers can provide activities adapted to the interest and social abilities of students with NDC.

Students' voices are seldom heard, and they are, based on the results in study IV (Leifler et al., 2022), seldom involved accurately in the support planned, conducted and evaluated for them. Students with NDC can and should be involved in decisions concerning them. The involvement and student perspective has to increase with age. In secondary school, inclusive education can be even more complex and assessment of inclusion reality by, e.g., the use of instruments (INCLUSIO, study IV), can include students' voices. The importance of listening to the voices of students when preparing and providing support and interventions is a core component for success (Kucharczyk et al., 2015; Pellicano et al., 2014; UN, 1989). Schools have been encouraged to involve the views of the students to evolve practice; however, an important next step is to consider who is listening and will make the decisions based on the students' requests. Students with special needs might be a vocal minority and the schools need to develop a confident and knowledgeable staff group with sensitivity and ethos. The teachers and adolescents in SKOLKONTAKT described values and safety with the reciprocal relationship. Moreover, when planning for research, listening to the students requires flexibility between listening carefully and considering the broader context. There is a need for expertise when making judgements of support and accommodations in practice. When

crafting individual interventions or comprehensive school-based interventions for high school students, it is critical that they are feasible and acceptable (Kucharczyk et al., 2015). Less focus has been given to adolescents with NDC and how to deliver interventions with great social validity. In the future, improvement science has an important role in providing educators with more evidence targeting this group for better inclusion. The results of social validity in study III show that the students themselves are often aware of their impairments and are willing and eager to train and develop if under safe working methods and in a safe environment. The adolescents also expressed a wish for continuing with the training and in stretched settings with students at school or in the society. The training was described as valuable for further academic studies and work, which raises interesting questions about school and the content taught, where life-skills could be seen as important as other skills and abilities.

A multi-perspective study of experienced inclusive education for students with neurodevelopmental disorders.

The last study in the thesis (Leifler et al., 2022) sets out more of an umbrella view of educational inclusion, and the findings contribute to how inclusion works or does not work in practice for students with NDC. The result indicates that it cannot be taken for granted that all areas of the school environment are seen and evaluated similarly among different stakeholders. The knowledge from this study demonstrates that areas of strength in the learning environment are especially in the initial phase when analyzing and planning for the support. The collaboration between parents and teachers is moreover described as working only slightly well. The issues and weak areas concern the timing of the support being implemented in the classroom. This evidence from study IV indicates that there is a lack of inclusive didactics in the direct instructions, methods and scaffolding systems. Scaffolding systems such as organizational aids were not implemented in the classroom, which is remarkable since executive function impairments associated with NDC must be seen as basic didactic knowledge. If not, there is an urgent need of implementing special didactics in general teacher education. The reactions from teachers in study IV, or the enhanced awareness about neurodiversity and the student they taught, can be seen as serendipity improvement science, where probably and hopefully the reflection can make teachers start to act in order to include more students. The holistic view of inclusion is not implemented fully in practice, where all aspects of the learning environment are taken into account, e.g., the art of teaching, the physical placement and the social environment. The teachers in study II felt the social area was being overlooked and this cannot completely be met by just the classroom teacher or the special needs coordinator, but it is like Ainscow et al. (2006) put it—the business and concern of the whole school. There is no distinct inclusive education policy in Sweden, which leaves teachers alone with issues regarding how to implement inclusion in practice. This is likewise mentioned among scholars within the Swedish inclusion research (Göransson, Nilholm, & Karlsson, 2011; Magnússon et al., 2019; Nilholm, 2019).

There is a need for further investigation of all of the environmental domains and establishing and applying the biopsychosocial approach towards explorations and measurements of inclusion for more knowledge. The issue of how to operationalize educational inclusion is complicated because there is no universal instrument or model to use. The model from Bronfenbrenner (1991, 2005) and the ICF framework can be assistive in constructing and operationalizing educational inclusion in practice. The ICF Core Sets modified for school settings and the participation domain can enable stakeholders to identify barriers and enhance student outcomes (Mahdi, 2019). Moreover, to investigate inclusion in practice, instruments like INCLUSIO can assist researchers as well as school staff. There are others who argue about the impossible to evaluate and measure inclusion (Lindsay, 2003), where I believe we need the empirical knowledge and evidence from practice, from multiple perspectives, to improve the quality of educational inclusion.

Results from study IV (Leifler et al., 2022) present the collaboration between home and school as an area of strength. The collaboration process is however among various stakeholders for students with NDC, not only teachers–parents. Collaboration between school and stakeholders outside school was described as poor by the parents. Cooperation appears to be one of the key ingredients in inclusive education, and therefore the need of establishing networks and providing time for collaboration is still urgent. The recommended way to help students with NDC to development and better achievement involves a team effort, with parents playing an integral role as respected partners (Volkmar et al., 2005). There are several research-based general approaches for the teamwork between parents and professionals, where some of them align more to the school setting, e.g., helping family members to apply cognitive techniques (Pierangelo & Giuliani, 2008), but the cognitive techniques have to be implemented in the school setting as well. Even though the collaboration was described as working successfully, some of the parents expressed negative experiences earlier, at another school. Parents' perceived threat to inclusion is staff not being educated enough (Andersson, 2020; Falkmer, 2013; Paseka & Schwab, 2020). It is interesting that teachers in special schools for children with visual and auditory impairments require competence and qualifications to meet the needs of the students, but other types of impairments can still be invisible. However, this problem has been identified in Sweden (SOU, 2021:30), and the new teacher goal towards more knowledge about NDC is to be implemented in teacher education. The goal is however just a policy statement and not a guarantee for action or numerous opportunities for pre-teachers to learn how to set the inclusive agenda in practice. The findings from study II and IV, where most teachers do not adjust tasks, instructions or assignments and where in fact the lack of differentiation in teaching therefore demonstrates the urgency for the new goal of educating teachers, prove that the teacher education curricula also need to include the content of how to transform theory into practice, the *how* to do it. There is a risk of a too-theoretical or ideological curriculum, where in-service teachers will get few opportunities to develop special didactical skills or inclusion skills as is the concept in this research. In order to meet and teach for classroom diversity, NDC-specific knowledge

is needed because these findings demonstrate that traditional high-quality teaching and instructional strategies are insufficient.

The fact that teachers evaluated the learning environment according to educational inclusion as more inclusive than parents and students is an issue. This issue may be discussed from different perspectives. When viewing and exploring the learning environment, the voices from practice become important. In the large-scale study (Bölte et al., 2021a), the school management had more positive insights, and in study IV, the teachers had more positive insights, which sheds light on the importance of reflecting over how to investigate social phenomena and who has the right to measure it (Florian, 2014a). Due to the complexity of the construct, i.e., inclusive education (Magnússon et al., 2019), it is of importance to involve multiple stakeholders and look at educational inclusion from different angles and from different levels of the social system (Bronfenbrenner & Evans, 2000).

6.1 DISCUSSION OF THE STUDIES' SYNTHESIZED RESULTS

The psychosocial environment.

The first key elements in the synthesized results emphasize the lack of preparations and adjustments in the social environment for students with NDC. Despite supposed basic knowledge of social impairments in students, this domain was found as inadequate and insufficient in study I, II, III and IV. Educational inclusion is more than being there, it is about access to all activities, collaboration and participating equally, where students with NDC might need special support or adjustments to have equal access to learning and development. In the classroom practices, students with NDC were not participating in the same manner as their typically developed peers (Leifler et al., 2022), which can be seen as a barrier to inclusion in school. School is a social arena, and activities in school require social skills to be able to participate, develop and, e.g., show the teacher your knowledge. The fact that students with NDC in this research expressed lack of adjustments in the social environment is definitely an obstacle to educational inclusion. This is similar to the conclusions by Falkmer (2013), where she highlights the necessity for teachers to fully understand the child, including knowledge about a condition such as ASD and the possible consequences of such a condition on all levels of the school environment. Students with NDC from study IV perceived themselves as less understood by teachers and reported few accommodations in the social environment. These facts indicate that only preparing the learning environment for all students is not enough. Social difficulties are common impairments among students with NDC, and adjustments in this domain would possibly not be overlooked if personnel were more knowledgeable about specific conditions. Positive peer relations facilitate inclusion (Afsharnejad et al., 2022; Du Paul & Stoner, 2003; Falkmer, 2013), and preparing and providing students with NDC opportunities for positive interactions should therefore be provided by personnel in mainstream schools. Hence, interventions in schools for enhancing inclusion should preferably include teaching students with NDC basic social skills, e.g., communication and interaction strategies. Moreover, friendship interventions may help children and youth with NDC in developing the skills for making and

keeping friends. This social aspect of educational inclusion should not be overlooked. Friendships and the feeling of belonging are vital to students' well-being and overall development in the areas of social skills, language and cognition (Chang & Dean, 2022; Willis et al., 2019). The psychosocial environment additionally includes positive teacher–student relationships.

Simultaneously with the movement towards inclusion and providing education for all students in the mainstream classroom, there have been major educational changes that have altered the role of the regular class teacher (Florian & Camedda, 2020; Forlin, 2001). The place of disability within teacher education programs is a way of preparing teachers for teaching all children, including children with a diverse range of abilities and disabilities, which can be seen as essential for the educational inclusion of students with NDC. On the other hand, teachers are increasingly required by control documents for education where balancing between high stakes testing, measurement of quality and students' achievement and published ratings of schools create multiple tensions. Another tension is the risk of identification of difficulties in learning or a disability and the probable association on what learners cannot do. This is a key challenge for inclusive pedagogy according to Florian (2014) and many other scholars. The diagnosis and special education needs might hinder inclusion if teachers believe some learners are not their responsibility. This can be described by the metaphor from Donohoo and Katz (2017): when teachers believe, students achieve. Florian argues for more focus on what is to be taught, as well as on the quality of relationships between teacher and learner and a more flexible approach. This is in line with several approaches to teaching for diversity, e.g., the UDL, the recommendations from UNESCO and UN as well as the art of special didactics (Bruun, 2017). The student–teacher relationship is especially important for students with NDC, as found in study IV, similar to the findings from Plantin Ewe (2019). The special didactics knowledge according to Bruun (2017) includes competence of how to develop positive interactions and relationships with students. In the practical level from Bronfenbrenner (1979), the child's development and health are affected by and dependent on interactions of the participants of the child's close environment. The more encouraging and nurturing these relationships are, the better the development of the child (Bronfenbrenner, 1979). All these important aspects of teaching mentioned above can sufficiently be met by a broad competence of abilities as well as disabilities in students with NDC. The questions and document analysis in study IV still show that the problem and the placement of difficulties are described as owned by the student, similar to the findings from the investigations by Castro et al. (2014) and Hjørne (2011). This threat to inclusion can be met by more knowledgeable personnel, where explicit knowledge of NDC is needed.

General teachers need specific knowledge of learners' characteristics.

New discourses and new knowledge as described in the introduction, e.g., special didactics and inclusive special education, i.e., how teachers need flexibility and awareness of how teaching can be qualitative for all students, are core components for educational inclusion.

The knowledge has to include specific knowledge of learners' characteristics to meet diverse needs. The results from study II, II and IV all found evidence of poor inclusion for students with NDC, despite several years of experience among the participating teachers. The teachers nevertheless wished for more competence and expressed being left alone with trying their best in practice. The second key element is therefore that the system is not meeting the needs of classroom practice, or special didactics are not developed and gained by regular teachers. Traditions from the past, inclusive philosophies (Ainscow et al., 2012) can be transformed into practice if the ascertained legitimacy of the new discourse, based on human rights, social justice, equity and diversity, meets the traditions from special education where special support (strategies, approaches, evidence-based methods) are implemented naturally. This is a new inclusive epistemology. The concepts of educational inclusion and special education are multifaceted, and the combination provides an approach where students' special educational needs and the right to belong and participate in society can be met. The clarification of students' special educational needs and eventual diagnoses can supply and prepare for knowledge and understanding, which are important for support provisions.

Mainstream education is a challenge for students on the autism spectrum and with ADHD (Morewood et al., 2011). To understand the discrepancy between the academic strengths and at the same time their difficulties, e.g., in the social world, can be hard to understand without extensive knowledge of the condition. Teachers might have the assumption that students who are academically able should be able to handle the school environment, maybe even more when students grow older, in secondary school. The students in study III and IV expressed great difficulties and challenges in the social environment, which can hinder inclusion. The two contradictory perspectives in inclusion literature, as described by Ravet (2011)—on one hand, the rights' perspective and the right to belong, where schools should provide support and change, and on the other hand, the needs perspective with provision to the distinct needs of certain groups of learners—can be combined. This is in agreement with the integrative approach, wherein elements of both perspectives inform the enactment of educational inclusion (Hornby, 2015; Morewood et al., 2011). With this approach, general teachers as well as special education teachers have more specific knowledge of learners' characteristics.

Knowledgeable personnel.

Furthermore, in inclusive practices, the whole staff should subscribe to a set of values that are keys to inclusion. Such values include reducing barriers to learning and participation for all students, increasing the capacity of the school to respond to the diversity of students and putting the inclusive values into action in education (Ainscow et al., 2006). Teachers and other school personnel are key policy-makers, and having a theoretical basis and inclusive values are starting points for inclusive teachers. An important adjunct is staff who are convinced that all students belong and can be educated in mainstream schools. With the broad inclusive education perspective, the support, special didactics and special education cannot completely take part in segregated settings (even within the school). Special needs teachers and coordinators need to work closely together with the regular classroom teacher so

the learning environment is properly prepared. Special needs teachers and coordinators have an umbrella responsibility for the support: ensuring the day-to-day provision for students with special education needs alongside providing guidance and deploying staff with support (Symes & Humphrey, 2011). In this responsibility, special needs teachers and coordinators shall evaluate the efficacy of resources and make long-term plans for special needs provision. Findings from study II and IV indicate that the existing collaboration in today's inclusive classrooms is not always working optimally, probably due to lack of time for general teachers as well as special needs teachers, also expressed in study II. The lack of time, resources and the right facilitating conditions are important factors for inclusion success, and therefore the school management has an important role in design and in providing the right circumstances for teachers and other personnel to develop inclusive skills and inclusive learning environments. The development of inclusive skills for teachers is made in collaboration and with professional development for all personnel.

“The whole school approach” is another major trajectory for inclusion. Professional development should be provided for all staff, especially for general teachers, if the inclusive classroom is to be truly inclusive. Ensuring that teachers are provided with high-quality professional development is crucial in improving educational inclusion. One approach to strengthen positive beliefs about students with disabilities is to ensure that pre-service teachers are prepared and offered experiences with and strategies for teaching students with disabilities. Special education programs and general teacher education or curricula are still largely separated within universities (Florian, 2014b). The new goal for general teacher education in Sweden (UD, 2020) shed light upon the diverse needs of students with NDC in mainstream settings, also showed in study IV, where individual support correlated strongly with experiences of inclusion and how it works in practice. Students with NDC can have executive function impairments that can cause behavioral problems (Jacobson et al., 2011). Individual support should be based on neurodiversity, but without explicit knowledge of different conditions and difficulties, this might be an impossible task for teachers to solve. In addition, inclusion is teamwork and a process, and more knowledge among all school personnel is a bridge to further inclusion (Booth & Ainscow, 2002; UN, 1994).

Inclusive classroom practices are about all learners. However, without explicit focus on certain learners, there is a risk of underachievement and exclusion for those in need of more complex support. The complexity in the needs cannot be covered just by designing a good learning environment for all. By preparing the learning environment sufficiently, it sometimes requires something in additional. That additional, traditionally conceptualized special education, should however be a natural part of pedagogics and didactics and the work in school if the educational system is closer to fulfilling the Salamanca statement. Special education can therefore be seen as or become a threat to inclusion if the knowledge base is not spread among all professionals at school. One approach to strengthen positive beliefs about students with disabilities is to ensure that pre-service teachers are prepared and offered experiences with and strategies for teaching students with disabilities. The new goal for teacher education will hopefully give students with NDC in mainstream settings a more

satisfactory situation. Even special educators highlight this issue, which is the limited knowledge of NDC held by general educators (Kucharczyk, Reutebuch, Carter, Hedges, El Zein, Fan, & Gustafson, 2015).

I believe we need a new paradigm where we name neuropsychiatric conditions without letting the label steer the direction or perceptions in school. The school environment is still a learning context for all, where all children belong and no children are special or need to be changed to fit in. Naming learners generates more knowledgeable professionals who can match up more adequately and sufficiently with an individual's needs. In summary, it is for broader and deeper understanding of classroom diversity and different conditions.

The third key element from the summarized results concerned more competence and knowledge within all school personnel. The tradition with expert knowledge in forms of special needs teachers and coordinators is vulnerable and does not provide equal education or more inclusive school settings. Separate teacher education programs, where special education training is segregated from general teacher education, is a barrier to inclusion (Florian, 2010; Forlin, 2010). Courses about inclusion would preferably be embedded within the regular teacher curriculum. Teachers in mainstream classrooms need to be knowledgeable enough to respond to human differences. This means shifting from most and some learners to all learners. However, this movement is not without its challenges (Florian, 2014b).

Inclusive special didactics.

In addition to the third key element about more competence, there is a need for conceptualization and concretization of the desired knowledge, where the term inclusive special didactics can provide clarification and is an attempt to define of what is needed. The special didactics described by Bruun (2017) can align with this term, where understanding and empathy, expressed by the students in study IV as central for teachers' inclusive skills, are at the core. These important factors for inclusive for teachers' skills are grounded in the theory and philosophy from legislations and acts of inclusion, which outline that all students no matter the prerequisites belong in the classroom and have the right to high-quality teaching. Understanding and empathy are core factors for the development of healthy relationships, where students with ADHD seem to have less well-working relationships with teachers (Plantin Ewe, 2019). Relationships are significant in a child's development and learning (Bronfenbrenner, 1978), and the more encouraging and caring the personal interactions are, the better the prerequisites for healthy lives. Inclusive didactics align with teachers that believe all students can be taught in the classroom and with having positive attitudes and high expectations for all students. It is the acceptance of diversity, believing in human rights and that all children belong and can be educated together with intrapersonal collaboration. In this view of educational inclusion, inclusion is teamwork with a focus on all children as well as on all teachers. Furthermore, the knowledge and skill of inclusive special didactics mean teachers are aware that certain conditions might require special support, e.g., a small room for retreating close to the classroom, eating in other places than in the cantina, friendship support during recess, careful planning for peer or group work, repetition of and

additional instructions and planning or motivation support. In fact, within inclusive special didactics, core components of knowledge are the awareness of the diversity in learners' characteristics and special educational needs and how that explicit knowledge can further be transformed into instructions, methods and other teaching strategies. The knowledge of learners' characteristics includes information about the variance of needs with sometimes contradictory requirements, e.g., the need of predictability and repetition for students with ASD and the need for variation and learning by doing for students with ADHD. This broad competence includes the knowledge of the learners that might be most vulnerable to underachievement, marginalization or exclusion and the changes that need to be made in order to reach out to these students for improved outcomes. To develop and practice inclusive special didactics, teachers need opportunities to learn more about specific conditions and the evidence-based methods and strategies that are well-known to be beneficial for child development and learning. This knowledge should be both theoretical and practical.

In inclusive special didactics, the educational content is carefully considered and planned in advance, in line with the UDL framework (CAST, 2008). The transformation of inclusion values into classroom and practice includes awareness of all dimensions of the learning environment, where differentiated instructions, psychosocial support and concrete adjustments of tasks and assignments are some concrete examples. These concrete examples were all highlighted by students in study IV as not identified by teachers as being hindrances or obstacles. The art of inclusive special didactics is teaching with the objectives of academic achievement together with life skills and learning to become part of and functioning in society, not overlooking mental health. The additional term *special* stands for special educational needs that have to be met in the classroom for goal fulfillment or participation possibilities that these findings demonstrate are seldom met in practice. The inclusive special didactics are part of teachers' initial and continuing education, giving them the confidence to deal effectively and warmly with a range of learners' needs. This development of these skills is part of the inclusion process.

Evidence-based methods and interventions.

The last key element, interventions and evidence-based practice towards meeting the needs of students with NDC, is more often implemented internationally. The large number of interventions and accommodations found in the review (study I) did not identify any study from a Swedish school context. The school in study III had applied for and was granted extra funding for the SKOLKONTAKT project. As far as the author can discern, there are only few avenues of funding for schools because it is the duty of the government and municipality to organize and fulfill the needs of schools, including special education and support for students. Moreover, there is a tradition in Sweden of no statistics over students in need of support or evaluating the support given (SOU, 2021:30). In the future, collaboration between organizations, professionals in and out of school and better funding opportunities can be promising approaches towards more inclusive agendas for students with NDC. In order to provide early intervention and better outcomes in school, we need early detection and

rigorous and reliable screening methods. The new goal in teacher education curricula highlights this important skill for future teachers: *the ability to identify and in collaboration with other professionals cater for students' special education needs including special support for students with neurodevelopmental conditions* (UD, 2020).

The key findings from the overall results are equal in nature and linked to each other in one way or another. The evidence from study III and IV demonstrate that life in mainstream school environment can be difficult for students with NDC with negative school experiences and poor academic outcomes. However, there are promising approaches for improved inclusion. The last key element, the need of more innovative approaches in school settings, is aligned with the need for more social environment interventions and more focus on the psychosocial aspects important for inclusion. There is, unfortunately, an increase in school absenteeism, and there are reasons to believe that the situation can change by implementing strategies, methods and interventions targeting this area, a holistic approach of inclusion and the learning environment (Tufvesson & Tufvesson, 2009; Küller, 1991). Literature shows that specialized school settings have more resources, for example, more staff in relation to children and smaller group sizes (Lundqvist, 2016). According to what has been explored in this thesis, the resources may influence the context and what conditions are offered for participation and learning, and the possibilities for schools for extra funding for more flexible approaches and interpersonal collaborations cannot be overlooked. This economic aspect of inclusion needs attention, aligned with the concept of efficiency, the greatest benefit for the cost (Allodi Westling & Fischbein, 2000), where schools as organizations recently tend to focus more on economic goals rather than social goals and morality. Providing educational inclusion for students with NDC sometimes requires resources not economically covered in schools' original budgets.

There are several programs, frameworks and analytical tools designed to assist schools in pursuing more inclusive agendas, e.g., APERS (Beijnö et al., 2019), The Bridges and Barriers model (Holcombe & Plunkett, 2016), the ICF codes/WHO (Bölte et al., 2018; Bölte et al., 2019; Mahdi, 2019), the Systemic Change Framework (Ferguson, Kozleski, & Smith, 2003) and universal design for learning, UDL (CAST, 2008). It is vital that the school staff have access to user-friendly tools that can enable them to assess all aspects of the learning environment, where the instrument INCLUSIO can be seen as such, especially designed for capturing the needs of students with NDC. Comprehensive models for improving school situation and learning for students with NDC do not exist to a large degree in Sweden, and the author believes they are very scarce. The content and broadness of programs and models for autistic students or students with ADHD varies, but the focus is on successful learning for all and removing barriers for learning. Many of the approaches are towards changes in the learning environment and less focus is paid to disabilities and impairments or the individual, which should therefore suit the Swedish perception of how to best support students in the classroom. The results from study II and IV demonstrated poor general knowledge of special didactics, where the content in tasks and activities need to be differentiated or prepared specifically for students with NDC. Several of the approaches, modifications and adjustments

presented for teachers were not implemented in the learning environment despite special needs teachers or coordinators at the participating schools. Interventions for the students with NDC should be targeted and carefully considered and preferably implemented within the inclusive school setting in order to be a good fit for the student and the context. Evaluating interventions requires competence and understanding of the students' needs in order to be well-targeted. It is not easy to understand students' complex needs and the specific nature of the students' difficulties. Mahdi (2019) also argues for the complication of understanding of how changes in the environment should be implemented without accounting for how impairments may influence functioning in different settings. Moreover, the implementation of interventions has challenges, where the effect can be less beneficial with poor implementation. Examining social validity is one approach for the development of effective implementation of interventions and extensive teacher knowledge of evidence-based methods and collaboration among staff for efficacy is another. Another challenge is the high demands on general teachers and lack of the right resources as mentioned, where prerequisites for teachers and schools as organizations should be formatted on the policy-level as well as on practical levels in order to improve inclusion.

Nevertheless, despite all legal acts, efforts and developing practices, the persistent achievement gap between students with NDC and their typically developed peers must be addressed more properly and from several horizons. The focus can be on changing the system, e.g., professional development for teachers, and at the same time, implementing individual or group interventions for the students. Furthermore, the importance of empathy, respect and listening carefully need attention in order to give the students and parents a voice in research to contribute to the better learning of all students and which are highlighted as success factors by several researchers (Barnard et al., 2000; Volkmar et al., 2005; Warren et al., 2021). This is significant for further developing and creating positive ethos and clearing the picture for all aspects of practical inclusion, visible and invisible. The way forward for practicing inclusive education is the responsible way, where the learning environment is adjusted appropriately, which includes specific knowledge of the needs of all students in order to fulfill the task and provide access and participation in all dimensions of the learning context, the pedagogical, the physical and the psychosocial. In summary, only preparing the learning environment for all students without focusing on individual characteristics and their needs is not enough.

6.2 OVERALL METHODOLOGICAL CHALLENGES, CONSIDERATIONS AND LIMITATIONS

Educational research and any aspects of teaching and learning require raising thoughtful questions about what it is, what we do and why we make certain choices (Hallet & Hallet, 2010). When conducting the research, we need to consider integrity, open-mindedness and clarification of purpose. Epistemological stances and paradigms draw attention and define deeper assumptions about the nature of knowledge (Morgan, 2007). However, the researcher's worldview influences how research questions are asked and answered. Thus, the

design, data collection, analyses and interpretation all have considerations of validity and reliability as a natural basement. Validation of findings occurs throughout all steps in the research process (Creswell & Creswell, 2018).

6.2.1 Issues with ethics

Ethical considerations were present during the whole research process, from planning stage, through data collection and data analyses to writing the manuscripts. Researchers in the social sciences are more so confronted with an institutionalized questioning of the ethics of their research and increasingly in need of ethical approval for the pursuit of their research (Giraud, Cioffo, de Lettenhove, & Chaves, 2019). Research ethics play a fundamental role in all research fields, but traditionally more focus is on the medical field, as research in social sciences is rarely conducted in laboratory settings. Social science research might have the right to be more flexible, as long as all the ethical considerations are carefully taken into account. Ethical issues are essential and a checklist can help remind the researcher of them (Giraud et al., 2019). However, all phenomena might not be covered by the checklist. The principles guiding ethics in medical science are too narrow for the diversity of social research, according to Oakes (2002). Guillemin and Gilliam (2004) describe two distinctions of the concept ethics: *procedural ethics* and *ethics in practice*. Procedural ethics is the process of researchers seeking approval for their study from an ethics committee. The procedural ethics is a preventative stage of work before conducting research with human subjects. It includes questions about the purpose of the research and if any harm is being done to the participants. Ethics in practice is all the ethical questions and dilemmas that arise when actually conducting the research. Guillemin and Gilliam (2004) highlight the importance of being aware of unexpected situations and “on demand” questions. During the research process, unpredictable situations and challenges have to be addressed by the researcher. With less experience and lack of supervision this might cause problems. Ethical behavior is influenced by several factors, such as the individual, the issue and the organization in which the researcher is embedded (Beu, Buckley, & Harvey, 2003). Ethical decision-making relies on the individuals’ cognitive moral development, personality and locus of control. Giraud et al. (2019) suggest more experience and training to avoid ethical wrongdoings. Moreover, when it comes to research with vulnerable populations, researchers carefully have to take into account ethical issues related to research in humans and their privacy, particularly as it includes minors, individuals who are vulnerable or unable to consent. Some educational studies may interfere with regular educational routines, and participants or units are randomly allocated to treatment/environment as usual or to potentially more effective conditions. This—having control groups in educational research—is also questionable.

6.2.2 Issues with epistemology

The concept of epistemology, in general, is the study of knowledge. But what is true knowledge? What is true knowledge of inclusive education approaches? There has to be evidence based on empirical grounds, where measurements of inclusive education need several approaches to be understood as a whole. Producing new knowledge is the major part

of research, and thus epistemology has a significant impact when stating beliefs and traditions in research fields. Traditionally, there are probably more issues with ethics and politics than epistemology (Haraway, 1988). However, social science research together with other research fields still struggle with the concept “objectivity”. Haraway (1988) describes the problem with trying to find “the perfect research” and a tool for deconstructing the truth claims of hostile science. Science, making meanings and new knowledge claims, is not constructed without the scientist’s own “semiotic technologies” and a piece of subjectivity (even though, being aware of this, no scientist can exclude themselves from the analytical process). This is in line with Pedersen and Pini (2017), who present the complexity with researchers’ familiar concepts, approaches and ontologies. They discuss threats to believing in objectivity and possibilities to quickly changing old, familiar categories. Two well-known methods in educational research, interviews and auto-ethnography, including human subjects, require critical thinking and questions such as “have I listened carefully enough?” (Pedersen & Pini, 2017, p. 1052). As a new researcher this might be even more important with reading very carefully to adapt and being aware of all the deviance. Interviewing the adolescents in the SKOLKONTAKT (study III) and INCLUSIO (study IV) research granted opportunities to listen carefully and go through the data. This is what Holloway and Jefferson (1997) agree with, but they add a practical view, the “double interview”, where they recommend reading through a different lens. We need to open up for unexpected readings and listen to our material (Lather, 2013).

Furthermore, there are epistemologies which have to be understood, and this deeper understanding, maybe especially what it means, the impersonal, not subject- or self-centered research is a challenge to new researchers. Lather (2006) tries to help new researchers by mapping out paradigms and the variety that characterizes different approaches to educational research. The diagram shows incompatibilities, but Lather is against “methodological fundamentalists”. Research in all dimensions is a balance between the paradigm, the discursive formation and the making of a meaning. When analyzing data, there are also different approaches and traditions. In some fields a software program is more valid, where in the life-world phenomenology this is not seen as the perfect analysis. Analytic practices are processes with more than just cutting and pasting of coding. The author prefers looking at the data in several ways, where the analog version granted a better overview of the material and felt easier to thematically organize.

Cross-disciplinary research has many challenges, where one is the discursive formation, and statistics is a language, a strong language that has been allowed to focus less on philosophy (Lather, 2006). Traditionally, in the medical field, statistics has a high hierarchic position. Knowledge of power, bias, attrition, significance and sample size are highly required skills, where in educational research, knowledge of the theory of language and epistemology are equally valid. In this interdisciplinary project, there are multiple approaches where the statistic language, philosophy and theory shape knowledge together.

Haraway (1998, p. 580) highlights the need for the power of modern critical theories of how meanings and bodies get made. Furthermore, she explains that science is a search for translation, convertibility and meanings. The universal solution in research seems to be transparency, or moving beyond narrow scientism and instrumentalism (Lather, 2013). Even though new voices are heard and the talk of a post-neo-liberalism has begun to sprout, there is still a lot of money spent on “big data” and quantification in research (Lather, 2013). Research fields try to expand, be more flexible and look at different angles, but tend to fall back to their origins. Big data studies or other quantitative research is one way to understand and gain knowledge about the education system and students’ learning, where qualitative data collection is another. Exploring educational inclusion from a practical perspective and with students’ lenses can possibly be beneficial for a deeper understanding the phenomenon.

6.2.3 Issues with mixed methods research

Mixed methods research has been called the “third research paradigm”, first derived from quantitative and then qualitative research (Creswell & Plano, 2018). Since life is dynamic and consists of multiple visual ways, Creswell and Plano (2018) argue for multiple ways to address research questions. Some questions are better answered by using mixed methods, according to the authors. In mixed methods research, the researcher collects and analyzes both kinds of data to answer the questions and hypotheses. Despite the new interest in using mixed methods and the possibility of broadening research techniques, there are some threats and questions to consider. Creswell and Plano (2018) highlight the importance of being aware of some specific issues early on in the research process, of thinking about the time that is available to collect and analyze data and whether there are sufficient resources and if the researchers conducting the study have appropriate skills and knowledge to complete mixed methods research. Furthermore, the research problem has to be best suited for a mixed methods approach, and through that follows true understanding of what the method actually is, which is beyond only core characteristics. There is a philosophical dimension, with assumptions and beliefs about knowledge, that also plays a fundamental role in the research process. In addition, there are some critical voices, e.g., Freshwater (2007), that claim mixed methods researchers tend to adopt a sense of incompleteness. Furthermore, there is a tension in the discourse between concepts used in quantitative approaches and qualitative approaches. Morgan (2007) tries to give us an explanation of why combining qualitative and quantitative methods has become more popular and how it can reach legitimacy. He describes the methodological implications of when a paradigm changes, and one of his conclusions is that we need a properly integrated methodology for social sciences. It is not enough to create major changes in a dominant belief system, as new paradigms offer new ways to think about the world, but it is significant to think about all the methodological issues in the field and take advantage of the practical strengths and link that with different orientations. Bryman (2006) conducted a content analysis of 232 social science articles in which quantitative and qualitative methods were combined. He found issues such as ones where the two methods did not always correspond, which affected quality.

Another dimension of mixing methods is the question of which data has priority. Is it the quantitative or qualitative data? This is in line with Brew's (2001) *False Primacy*, where either quantitative data or qualitative data tend to dominate. Furthermore, Bryman (2006) discusses issues with integrating the two data forms and threats when following a multi-strategy research, where the outcomes are not always predictable. Qualitative research has risen in legitimacy (Morgan, 2007), however there are still some who prefer it in specific fields (Bölte, 2014). Many researchers (Creswell, 2003; Creswell & Creswell, 2018; Morgan, 2007) with methodological lenses highlight the importance of letting the research questions determine the choice of research method, but mixed methods might still be a methodological threat because of the difficulties with clarity. Research questions determine the research process, but Morgan (2007) also argues for researchers to be aware of who we are in that process and how we make the choices about what is important and which methods are most appropriate. In interdisciplinary research, such as this thesis, it might be even more important. I conclude with a citation from Morgan (2007, p. 67): *"to what extent are two research fields satisfied that they have understand each other, and to what extent can they demonstrate the success of that shared meaning by working together on common projects?"*

The qualitative synthesis of results in this thesis is based on a balance of quantitative and qualitative data, where neither of them dominate. The mixed methods approach has given opportunities to examine and understand the broad and complex research questions.

6.2.4 Limitations

There are some limitations in the studies which limit the generalizability. First, the systematic review only included accommodations for autistic students, where the overall NDC focus lacks perspectives of ADHD. However, interventions for students with ADHD were searched for in literature and studied in parallel for overall understanding of educational inclusion of the target group. The rest of the studies represent ASD and ADHD equally. Second, the sample size is small in study II, III and IV. The intervention for teachers did not include a control group, but nevertheless there were three participating schools for broader statistical analyses and sufficient measures of evidence. Moreover, the study did not measure students' outcome or students' expressed improvements in the learning environment. The aim was not to measure student outcome, but nonetheless doing so could have provided further interesting evidence. There is a small gender bias as well as representing group bias where there is not even representation of personnel categories. The investigations of social validity in study III could be combined with a long-term follow-up for more sustainability in the measurement for more reliable results. With regard to gender and age differences among students, no analyses were done and there were no considerations of confounding factors, such as comorbidity, symptom severity, culture, school conditions, sources at school or socioecological background. Thus, the results should be interpreted with caution, but nonetheless the results have covered relevant aspects of educational inclusion and the outcome is valuable for stakeholders in practice as well as on the policy level of society.

7 CONCLUSIONS OF THE EMPIRICAL STUDIES

The characteristics of educational inclusion investigated through a series of studies can be summarized as follows: (1), the specific needs and conditions associated with NDC have to be addressed when preparing the learning environment for inclusion, and a structured learning environment is the first important step, but is nevertheless not complete or sufficient; (2), the psychosocial environment and students' well-being, prerequisites for learning, are a neglected area of research and not adjusted enough for students with NDC— social skills group training or individual social skills training can develop and improve the social environment in schools; (3), the surrounding environment needs awareness and adjustments to give a safe context for the right training prerequisites, and general teachers need and ask for more competence in meeting and teaching students with NDC in mainstream classrooms; (4), innovative approaches and interventions can be implemented more frequently in inclusive settings for enhanced educational inclusion.

The quest for more knowledgeable staff for educational inclusion is in line with Petersson-Bloom (2020) and Petersson-Bloom and Bölte (2022), where the specific and sometimes complex needs cannot be met without broad competence. Collaboration with special needs teachers and coordinators is one way of addressing the diversity in the classroom, but nevertheless, inclusion excellence requires both more extensive and more evenly spread competence. The lack of understanding and recognition of needs in diagnosed students has been largely documented in other studies (Bölte et al., 2021a; Falkmer, 2013; Stark et al., 2022), and the situation has led to the urgency of having new learning objectives in teacher education curricula (UD, 2020). When preparing and adjusting the learning context, just targeting the overall learning environment for high-quality teaching and equity is not enough due to the lack of taking into account the individual differences or needs that exist between students with NDC. The bio-ecological model by Bronfenbrenner (1978, 2005) and the bio-psychological model by WHO (2001) can assist stakeholders in appraising and documenting health-related functioning in school settings. In addition, new developed instruments can provide tools for assessing the learning environment, e.g., INCLUSIO (Leifler et al., 2022).

Interventions aiming to improve the psychosocial environment are necessary for the students' development, learning and mental health. However, implementing interventions is complex and can be costly and might require further funding for schools, also highlighted by Hume et al., (2021) and Kucharczyk et al., (2015), where they emphasize the necessity of implementing evidence-based methods for students with NDC and how that calls for rigorousness and competence in the school setting. There is a need for balance between the art of interventions where interventions and accommodations that are preferable and in majority should focus on the learning environment and not impairments or modification of individual traits. Hence, social skills training should likewise implement interventions targeting the surrounding environment, e.g., enhanced autism awareness among peers and all school staff.

In agreement with, e.g., Hornby (2015) and Ravet (2011), the inclusive philosophy can be combined with evidence-based methods and strategies originally placed within traditions from special education. Our results demonstrate evidence and favoring of interventions targeting NDC for teachers and students, aiming to improve inclusion. This implies educational inclusion is better met when addressing the quality of the learning environment from two standpoints, general improvements as well as additional improvements explicitly implemented for students with NDC. The focused interventions have to be designed and evaluated advantageously together with the child or youth and further in collaboration with different professionals. Parents are significant information providers when understanding and preparing for support. Hence, our results emphasize the importance of further exploration of psychosocial factors in the environment, in several school years, not forgetting higher grades. The advantage of the studies included in the thesis is the multi-perspective, where implementing interventions is evaluated from several standpoints. Furthermore, identification and assessment of educational inclusion domains from the perception of students, caregivers and teachers provide valuable comparisons for future research orientations. This perspective is in line with Florian (2014a), questioning how measurements should be made for capturing inclusion reality. Legal acts and declarations of human rights state that children with ASD and ADHD should attend mainstream school and be provided the necessary support in the learning context (UN, 2006, 2015; UNESCO, 1994, 2005). The findings here confirm the discrepancy that still exists between legislations for inclusion and how it is implemented in school settings in practice. The needs of the students can be diverse and the complex task of designing interventions and adequate methods are preferably conducted in collaboration with staff. Nevertheless, regular teachers should be better equipped with understanding as well as tools in order to deal with student diversity in the classroom. The tools are knowledge of concrete accommodations for participation and accessibility.

In Swedish school settings, we have included students with NDC in mainstream classrooms since 2011 and we have to make it work better. Students with NDC without comorbidity have few alternatives and sometimes no option but to attend mainstream schools, and in many cases, they will not receive appropriate and sufficient support. The process and teamwork for improved educational inclusion starts with the knowledge of the dynamics and dilemmas, continues with preparing and providing the right circumstances (including awareness of the costs), and for the best of the students, ends with actions and concrete improvements in the learning contexts. Excellence can be achieved, in line with the philosophies from Plato, by acting. To conclude, excellent educational inclusion is better achieved through skills that take place in practice.

8 POINTS OF PERSPECTIVE

8.1 FUTURE RESEARCH

The research studies in this project have brought attention to some areas where future research can contribute with more knowledge. First, the systematic review did not identify any high-quality Scandinavian research for students with NDC regarding how to accommodate the learning environment. Future intervention studies, conducted in a naturalistic setting with the aim of improving students' learning or well-being, would be fruitful. The second study brought attention to the lack of explorative research of professional development for general teachers and other school personnel regarding SEND students. If paraprofessionals are still being recruited to support students with NDC, there is a need for professional development and for examining the effects of that development for this group of professionals, as well as how they could implement inclusive values, maybe with explicit focus on the social environment. Moreover, it would be valuable to further examine different forms of professional development for improving inclusive practice in general. Another area of interest would be how the new teacher objective of educating students with NDC is implemented in teacher education, as well as the teacher students' perceptions of the need for knowledge.

The third and fourth study brought up the importance of listening to the students themselves. In the future, more research can include participants whose voices are seldom heard. In the Swedish school context, we have, with respect to the individual and not wanting to stigmatize children, been sensitive and careful with identifying children's needs. Labeling is a contentious issue in the field of education and special educational needs. We need more knowledge and understanding of good labeling processes and how children and youth themselves perceive the identification over time. There has been little research on labeling processes and positive, negative or ambiguous outcomes for learners. Furthermore, in Sweden there is no research of exploring the positive or negative effects of raising awareness among peers about autism and ADHD. This would further contribute to the participatory research (Fletcher-Watson, 2019), where incorporating the views of autistic individuals in the planning stage and implementation or evaluating stages is meaningful and ensures meaningful autism research. It is a sensitive area, raising awareness among peers, to avoid stigma and feelings of otherness, and listening to students' ideas is preferable. This might be a promising method to help peers see the child with NDC in positive light. Participatory research is another area of interest for future educational research.

Participants in the third study valued the social skills group training highly and described benefits with conducting the training in school settings. However, the procedures around rigorous research, i.e., RCT, hindered the possibilities of having schools as research settings. Spreading the format of good quality social skills group training in school settings in less rigorous forms would be fruitful. Likewise, there is a need of more research in Swedish

school settings about methods for improving students' well-being, e.g., measuring the effects of different methods for reducing stress or anxiety.

The fourth study raised questions about the school as an organization and how the support is implemented differently. Within schools it is difficult to adapt to inclusion, and further research can focus on several aspects valuable for, e.g., inclusion, resources, organizational structures, individual skills of teachers, instructional methods, methods for children to develop metacognitive strategies and teachers' relational competence. In study IV, the students described teachers' ability to understand and support them as varied, whereas exploring more in detail what those teachers who were mentioned by the students as having good or exceptional inclusion skills do would contribute to a deeper understanding of teachers' capacities to create inclusive learning environments.

8.2 IMPLICATIONS

The main conclusion from study I is that research mainly focuses on the narrow perspective of inclusive education or on the intervention approach. The environmental dimension is understudied and an identified gap. Furthermore, research for improving learning for autistic students is mainly conducted in clinical settings, where there might be issues with generalization, where future research can develop more agile but at the same time rigorous methods to use in naturalistic settings. Findings indicate that there are methods and strategies for enhancing inclusion for autistic students in mainstream school, but nonetheless exploring pedagogical strategies for improved learning is more frequently organized in segregated settings. None of the studies examined well-being among the students. On the other hand, functioning in school and an improved social environment can be linked to an individual's well-being. The psychosocial area can be addressed in future research for better inclusive strategies in school settings. For this purpose, the ICF Core Sets can be used to grab the whole picture, all domains of school settings and the interactions between the individual and the environment.

There are several conclusions from the second paper valuable for stakeholders in school settings. Professional development regarding children with SEND is seldom provided for general teachers. The teacher intervention can provide for and prepare teachers for classroom diversity. The program is not long-term but is a valuable starting point. School leaders are responsible for giving SEND students in general classrooms adequate and sufficient support, where more knowledgeable staff is one way to approach this. Furthermore, teachers need time and resources to implement inclusion strategies. An inclusive school setting is more qualitative when there is a whole school approach (UNESCO, 2022), and the whole school approach demands more competence among all personnel, where specific knowledge about special educational needs and disabilities are required. Students' well-being is frequently discussed, and this study, showing more readiness for improving the social environment, can support stakeholders with information about how to provide enhanced well-being among a vulnerable group of students.

The social environment needs more focus in educational inclusion for students with NDC. Social impairments are associated with NDC. Educational inclusion for students with NDC needs to give more individualized support to individuals in order to include them more successfully in mainstream school settings. The school is a social environment and without sufficient support, students are excluded from not only social events and activities but also from learning occasions. SSGT is advantageous in school settings for many reasons and can therefore give the students more chances to belong, develop and prepare for life in- and outside school. Additionally, the training seems to generalize knowledge for teachers as well as students.

As more students on the autism spectrum and other developmental conditions are attending inclusive environments, there is a need for an evaluation of praxis to improve inclusive education and possibilities for enhanced participation. The findings from this study show that the students themselves are still considered too much as the owners of the problem and the learning environment is not accommodating enough. Initially, there are sometimes similar views on the needs of the student, however there are issues in implementing adequate support. This study finds shortages and gaps in adjustments and support in the inclusive school setting for students with NDC, e.g., in the social environment and differentiated pedagogical content. The instrument INCLUSIO can guide schools in their quest for improved inclusion for vulnerable groups of students by examining and evaluating the environment holistically. Furthermore, the instrument can be used for multiple stakeholders and therefore provide a more reliable measurement of inclusion reality.

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