

# **Promoting self-determination for adolescents with mild intellectual disability**

Validation of a self-determination measure and  
evaluation of an educational intervention

Veerle Garrels



PhD Thesis

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# Summary

Self-determination is considered best practice for students with intellectual disability (ID), as it is linked to positive post-school outcomes (Wehmeyer, 2015). The promotion of self-determination through student-directed learning may also be beneficial for students' academic performance and motivation for school work (Reeve, 2002). However, research suggests that students with ID may be less susceptible to self-determination interventions, as they gain lower effects from such interventions than their typically developing peers (e.g. Wehmeyer et al., 2012). In Norway, self-determination for individuals with ID is both a political and an educational goal (Norwegian White Paper, 2016). However, there is a lack of validated instruments that can assess self-determination in a Norwegian school context, and Norwegian special educators lack evidence-based instructional models that can be used to enhance the self-determination of their students with ID. This doctoral thesis addresses these issues by i) validating the AIR Self-Determination Scale for use with Norwegian students with mild ID, ii) investigating the effects of an intervention with the Self-Determined Learning Model of Instruction on the self-determination and academic goal attainment of Norwegian students with mild ID, and iii) exploring which specific adaptations are required to both the measure and instructional model in order to meet the specific cognitive needs of students with mild ID.

The first two papers in this thesis spring from the validation of the AIR-S-NOR (student form). The first paper (Garrels & Granlund, 2018) reports on the adaptations that were made to the original AIR Self-Determination Scale and that were found necessary to make it fit for use with students with mild ID after initial experiences from a pilot study. The validation study indicates robust psychometric features of the AIR-S-NOR, and it also found a significant difference between self-determination scores for students with ID compared to typically developing students, where students with ID scored significantly lower. Data from the validation study were then used to explore how students with and without ID experienced their opportunities for learning and practicing goal setting and planning at school, two important component skills of self-determined behavior. Further, it was also explored which kind of goals students set for themselves. This analysis resulted in the second paper of this thesis (Garrels, 2017), and findings suggest that, while approximately two-thirds of the students feel encouraged to set goals for themselves at school, 38% of all students report that they never or rarely feel that they can engage actively in goal-setting processes, and almost 60 % of the students report that they do not learn planning skills or goal attainment skills at school. Whereas typically developing students most frequently identified leisure time goals for themselves, students with ID more often identified academic goals, but these differences were not statistically significant. However, the observed trend may suggest difficulties for students with ID to generalize goal setting skills to other arenas than school. Findings from this first and second paper contribute to the rationale for the second part of this doctoral study, as they underscore the need for evidence-based practice to aid teachers with implementing instruction in self-determination skills for their students with ID.

The second part of the doctoral study consists of an intervention study with the Self-Determined Learning Model of Instruction. This intervention study is covered in the third (Garrels & Arvidsson, 2018) and fourth (Garrels & Palmer, 2019) paper of this thesis. Research suggests that students with ID experience less effect from self-determination interventions than their typically developing peers (Wehmeyer et al., 2012), and therefore, it is important to reflect on how such interventions may be adapted to the specific needs of students with ID. Hence, in the third paper, a Vygotskian perspective on ID is presented, as this view takes into consideration both the individual's cognitive impairments as well as the necessity to adapt educational interaction to these impairments, so that complex cognitive abilities such as self-determination skills may develop. Challenges that were encountered during the intervention and remedies are reported in this paper. Finally, the fourth paper presents a summary of the intervention study, as it looks into how the intervention with the SDLMI affects students' academic goal attainment and self-determination. Findings suggest that student-directed learning with the SDLMI may have positive effects on students' academic goal attainment. When students get to practice goal setting and goal attainment, they gain proficiency in important self-determination skills. A pre-posttest comparison of AIR-E-NOR (educator form) scores suggests that educators experience that the SDLMI provides their students with ID with more opportunities to practice self-determined behavior. Students themselves did not report a similar change on the AIR-S-NOR. This may indicate that a three-month intervention with the SDLMI may not be sufficient to change students' self-reported self-determination, but that initial change may occur at the environmental level, as educators get a functional tool to infuse their educational practice with opportunities to train self-determination skills. This is in line with Mithaug's (2003) self-determined learning theory, which explains how self-determination develops within the individual. This theory, which accentuates the importance of frequent exposure to opportunities to practice self-determined behavior, forms the theoretical framework for this thesis.

Findings from the validation study suggest that there is sufficient reason for special educators to direct more attention towards teaching their students with ID self-determination skills, and this may also prove to be good practice for teachers in mainstream education. Findings from the intervention study indicate that the SDLMI may be a useful instructional model for educators who wish to introduce more opportunities for self-determined behavior in their classrooms. It is recommended that student-directed learning (such as e.g. with the SDLMI) becomes a natural part of Norwegian classroom practices. This may lead to multiple benefits for students, such as e.g. enhanced educational citizenship, improved academic goal attainment, and increased self-determination.

# List of papers

## I.

Garrels, V. & Granlund, M. (2018). Measuring self-determination in Norwegian students: Adaptation and validation of the AIR Self-Determination Scale. *European Journal of Special Needs Education*, 33(4), 466-480. DOI: 10.1080/08856257.2017.1342420.

## II.

Garrels, V. (2017). Goal setting and planning for Norwegian students with and without intellectual disabilities: Wishing upon a star? *European Journal of Special Needs Education*, 32(4), 493-507. DOI: 10.1080/08856257.2016.1261487.

## III.

Garrels, V. & Arvidsson, P. (2018). Promoting self-determination for students with intellectual disability: A Vygotskian perspective. *Learning, Culture and Social Interaction*, Online first. DOI: 10.1016/J.LCSI.2018.05.006.

## IV.

Garrels, V. & Palmer, S.B. (2019). Student-directed learning: A catalyst for academic achievement and self-determination for students with intellectual disability? *Journal of Intellectual Disabilities*. Online first. DOI: 10.1177/1744629519840526.



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# 1 Brief presentation of the thesis

## 1.1 Background

A systematic review of the literature suggests that individuals with intellectual disability (ID) are to a lesser extent engaged in community participation, they are three to four times less likely to be employed than their non-disabled peers, and they have limited interpersonal interactions and relationships (Verdonschot, de Witte, Reichrath, Buntinx & Curfs, 2009). These unsatisfactory outcomes for persons with ID demand action, and self-determination has been identified as a possible key element to enhance post-school outcomes. Increased self-determination is linked to positive outcomes in adult life, more specifically to more independent living (Shogren & Shaw, 2016), higher rates of employment (Martorell, Gutierrez-Recacha, Pereda & Ayuso-Mateos, 2008), increased community participation (Nota, Ferrari, Soresi & Wehmeyer, 2007), and higher self-reported quality of life (McDougal, Evans & Baldwin, 2010). Furthermore, self-determination may play an important role in the educational context, as it is linked to autonomous motivation for learning (Niemiec & Ryan, 2009). Thus the concept of self-determination is not only of interest for post-school outcomes, but it also deserves attention within the school context.

The present thesis investigates the complex construct of self-determination for individuals with mild ID and how it can be influenced by educational intervention. Mild ID is the most common form of ID (Carr & O'Reilly, 2016), and individuals with this diagnosis can generally master relatively independent living and engage in employment, even though they may require some support (WHO, 2018). Research indicates that individuals with ID may have lower levels of self-determination than their typically developing counterparts (Shogren, Wehmeyer, Palmer & Paek, 2013), and interventions to promote self-determination may not be as effective for this group (Shogren, Palmer, Wehmeyer, Williams-Diehm & Little, 2012; Wehmeyer et al., 2012). These findings suggest the need for special adaptations to self-determination interventions, in order to accommodate for some of the typical challenges that individuals with ID may encounter.

In Norway, self-determination is advanced as a political and educational goal for individuals with ID (Norwegian White Paper, 2016). Yet, until now, validated measures of self-determination have not been available, and educational efforts to promote the self-determination of students with ID in Norway appear random (Sagen & Ytterhus, 2014). In order to address this gap between ideology and practice, it is important to understand self-determination as a developmental and educational outcome. Self-determination is not a right or a privilege that can simply be given to the individual, but rather, it is the result of a life-long learning and refining of component skills that together constitute self-determination, such as identifying preferences, setting goals, developing plans for goal attainment, and self-monitoring and evaluating one's progress towards self-chosen goals (Shogren, Wehmeyer & Palmer, 2017:a). Student-directed learning, where students become active agents in their own learning processes by setting goals for themselves, developing action plans, and evaluating

efforts and outcomes, has been suggested as a way of stimulating central component skills of self-determination (Wehmeyer, 2003). This understanding of self-determination as an educational and developmental outcome guides the rationale of the current thesis: If we wish to promote the development of self-determination through educational intervention, we need to have at hand an instrument that can reliably measure levels of self-determination, and we need an evidence-based instructional model that is likely to enhance the self-determination of students with ID. Also, we need to investigate how we can adapt self-determination instruments and interventions to the specific cognitive profiles of students with ID. This doctoral thesis aims to address these needs.

## 1.2 Research questions

Three research questions have guided the work that was performed in this doctoral thesis:

- 1) *To which extent is the AIR-S-NOR a valid and reliable tool for measuring self-determination in school for Norwegian students with mild ID?*
- 2) *What is the effect of student-directed learning on the academic goal attainment and self-determination skills of students with mild ID?*
- 3) *Which accommodations and adaptations may be required in order to adapt self-determination instruments and interventions to meet the specific cognitive profile of students with mild ID?*

The first research question is addressed in the first (Garrels & Granlund, 2018) and second (Garrels, 2017) paper of this thesis. The second research question is discussed in the fourth paper of the thesis (Garrels & Palmer, 2019), and the third research question is addressed in the first (Garrels & Granlund, 2018) and third (Garrels & Arvidsson, 2018) paper. These three research questions may provide information as to how educators in Norway may assess and promote the self-determination of students with ID. Further, this thesis may contribute to the international knowledge base by providing insight into adaptations to self-determination measures and interventions when used with students with ID.

## 1.3 Outline of the PhD studies

The current thesis consists of two studies: 1) a validation and adaptation of the American Institute for Research (AIR) Self-Determination Scale, and 2) a student-directed learning intervention with the Self-Determined Learning Model of Instruction.

The first study aims to validate a measure of self-determination, namely the AIR Self-Determination Scale (Wolman, Campeau, duBois, Mithaug & Stolarski, 1994). A model of equivalence for cross-cultural validations (Herdman, Fox-Rushby & Badia, 1998) was used, and the psychometric reliability of the adapted instrument was tested on a sample of 121 students (mean age 12.3), of which 87 with typical development and 34 with ID. This study also investigated which adaptations and accommodations needed to be made to the instrument

in order to allow its use with students with mild ID. This first study forms the basis for papers 1 and 2 of this thesis.

The second study consists of a student-directed learning intervention with the Self-Determined Learning Model of Instruction (Wehmeyer, Palmer, Agran, Mithaug & Martin, 2000). This instructional model is used in a single-case experimental design study with multiple baselines, with a sample of eight Norwegian adolescents (age 13 – 16) with mild ID. The purpose of this intervention was threefold: i) to explore the model's fitness for use in a Norwegian special education context, ii) to investigate which adaptations may be useful for the target group, and iii) to examine the effects of the model on the academic goal attainment and self-determination skills of the participating students. This second study forms the basis for papers 3 and 4 of this thesis.

## 1.4 Outline of the thesis

After this introductory chapter, the thesis briefly explains ID as a medical disorder of intellectual development as defined by *International Classification of Diseases*, 11<sup>th</sup> version (WHO, 2018). This view is then supplemented with Vygotsky's dialectic interpretation of cognitive impairment and with the classification of ID as presented by the American Association of Intellectual and Developmental Disabilities. The chapter closes with a brief summary of how ID is understood in this doctoral thesis.

The third chapter of the thesis explains central constructs that are used in this thesis, namely self-determination, goal-setting, and student-directed learning, and it clarifies the link between these constructs. The chapter motivates the choice of theory in this thesis, and it gives an overview of research on self-determination. Gaps in the existing knowledge base are identified, and a logical rationale for the thesis is depicted.

In the fourth chapter of the thesis, the validation study of the AIR Self-Determination Scale is presented. Then, a presentation of the intervention with the Self-Determined Learning Model of Instruction follows, and findings from the intervention study are reported. This chapter further presents cognitive interviewing and qualitative case study methodology as an approach to the third research question that is addressed in this thesis. Ethical challenges in research with participants with ID are also discussed in this chapter.

The fifth chapter provides summaries of the four papers that are included in this thesis, with a particular emphasis on how each paper addresses different gaps in the existing knowledge base. While the first paper addresses the need for a reliable and valid measure of self-determination for use in Norwegian school contexts, the second paper assesses two central self-determination skills of Norwegian students with and without ID, namely goal-setting and planning skills. The third paper focuses on how a student-directed learning intervention with the Self-Determined Learning Model of Instruction can be adapted to meet the specific cognitive needs of students with mild ID, and the fourth paper presents findings from the single-case experimental design study aimed at enhancing academic goal attainment

and self-determination of students with mild ID. For each paper, the aim, methodology, and main results are reported.

The sixth chapter addresses in detail the research questions that have guided this doctoral thesis. More particularly, this chapter discusses theoretical and methodological challenges that may occur in the assessment of self-determination. The chapter also elaborates on the findings from the intervention study with the Self-Determined Learning Model of Instruction, based on a critical discussion of methodological challenges that may be typical of single-case experimental designs and school-based research. Further, this chapter provides a brief discussion of the accommodations and adaptations that were made in both the validation study and the intervention study. Finally, this chapter provides suggestions for future research and practice.

## 2 Intellectual disability

Before specifying how ‘intellectual disability’ (ID) is understood in this thesis, it is necessary to briefly clarify a number of related concepts, such as disability, impairment, capacity, and activity performance. These concepts are commonly used in WHO’s (2001) *International Classification of Functioning, Disability and Health* (ICF), which provides a standard language for the description of health and disease. According to ICF, *impairments* are problems in body function or structure, such as for example a significant neurophysiological deviation. *Disability* refers to an umbrella term for impairments, activity limitations and participation restrictions. With this broad definition of disability, ICF mainstreams the experience of disability, so that it no longer indicates a marginal experience, but rather a universal human experience, where focus is diverted from the cause of disability towards the impact of it. In other words, ICF implies a radical shift away from disability and towards level of health and functioning (WHO, 2002). A person’s *capacity* indicates what a person with a health condition can do in a standard environment (i.e. an environment that neutralizes the varying impact of different environments on the ability of the individual), while *performance* refers to what that person actually does in his or her usual environment (ibid.).

### 2.1 ‘Disorders of intellectual development’: A medical understanding of intellectual impairment

#### 2.1.1 Diagnostic criteria and classification

According to the International Classification of Diseases, 11<sup>th</sup> version (ICD-11), disorders of intellectual development are a group of neurodevelopmental disorders of diverse etiology that originate during the developmental period. Disorders of intellectual development are characterized by significantly below average intellectual functioning and adaptive behavior, i.e. approximately two or more standard deviations below the mean on standardized tests (WHO, 2018). Thus, an individual with significant impairment in intellectual functioning but no significant impairment in adaptive functioning will not qualify for a diagnosis of disorder of intellectual development, nor the other way around. A diagnosis requires that both intellectual functioning and adaptive functioning are significantly impaired.

Even though intellectual functioning is generally assessed by means of standardized intelligence tests, it refers to more complex intellectual abilities than such tests can measure. Instead, intelligence reflects a broader ability to reason, plan, solve problems, think abstractly, understand complex ideas, learn from experience, and comprehend and adapt to our environments (Luckasson & Schalock, 2013). Intellectual abilities also refer to executive functioning, i.e. processes that control and regulate thought and action, such as response initiation, response inhibition, planning, self-monitoring, and problem-solving tasks (Danielsson, Henry, Messer & Rönnerberg, 2012). Even though research shows a low correlation between intelligence quotient (IQ) scores and executive functioning (Willner, Bailey, Parry & Dymond, 2010), research findings are relatively consistent in that children with ID have lower executive functioning abilities than their non-disabled peers, and they

seem to experience difficulties with inhibition and planning especially (Danielsson et al., 2012). According to Danielsson et al. (2012), challenges in the development of different types of executive functioning may be related to experience and mental age. These limitations in executive functioning may cause difficulties for the individual to maintain goal-directed behavior and to inhibit distracting responses.

As stated in ICD-11, disorders of intellectual development are further characterized by significant impairments in adaptive behavior. Adaptive behavior refers to conceptual, social, and practical skills that enable a person to function adequately in everyday life, and it is generally a manifestation of impaired adaptive functioning that will start the diagnostic process for individuals with ID, rather than their impairment in intellectual functioning. Individuals with ID may show a complex adaptive profile, with strengths in some areas, and limitations in others (Wehmeyer et al., 2008). Research has shown a correlation between intellectual functioning and adaptive behavior, but a causal relationship between these constructs has not been established (Tassé, Luckasson & Schalock, 2016). Greenspan and Woods (2014) emphasize this correlational link between the dimensions of intellectual abilities and adaptive behavior, and describe cognitively mediated adaptive deficits such as gullibility, risk-unawareness in everyday life situations, and difficulties in anticipating future consequences of actions as core features of the behavioral phenotype of ID.

With its focus on deficits in intellectual and adaptive functioning, ICD-11 presents a medical, person-oriented definition of intellectual impairment. However, the constitutive definition of ID underlying this operationalization originates in a social-ecological understanding of disability, which suggests that ID exists in the discrepancy between a person's capacities and limitations as a function of neurobiological impairment and the context in which the person functions (Wehmeyer et al., 2008). This implies that ID occurs when there is a mismatch between the person's intellectual and adaptive functioning on the one hand, and the contextual demands on the other hand. Yet, it can be questioned whether the diagnostic process takes into consideration the (un)fitness that may exist between person and environment. Despite an underlying social-ecological understanding of ID in ICD-11, the diagnostic process may continue to support a highly person-oriented understanding of intellectual and adaptive impairment, as environmental supports or lack thereof are rarely assessed.

ICD-11 classifies disorders of intellectual development according to the severity of the impairment of intellectual and adaptive functioning, and distinguishes between *mild*, *moderate*, *severe* and *profound* disorders of intellectual functioning. A mild disorder is then characterized by intellectual and adaptive functioning that is approximately two to three standard deviations below the mean (approximately 0.1 – 2.3 percentile). Individuals with this condition will often exhibit difficulties with the acquisition and comprehension of complex language and academic skills, but, with the appropriate support, they can generally master self-care, independent living, and employment (WHO, 2018). Moderate disorders of intellectual development are characterized by intellectual and adaptive functioning that is approximately three to four standard deviations below the mean (approximately 0.003 – 0.1



percentile). Persons with this condition will often achieve basic language and academic skills, but most affected persons will require considerable and ongoing support in order to master life. Severe and profound disorders of intellectual development are characterized by intellectual and adaptive functioning that is approximately four or more standard deviations below the mean (< 0.003 percentile). Affected individuals will frequently have very limited language and communication abilities, they may have co-occurring motor impairments, and they will generally need extensive support in all life situations (WHO, 2018).

### **2.1.2 Prevalence**

A meta-analysis conducted by Maulik, Mascarenhas, Mathers, Dua, and Saxena (2011) found a prevalence of ID of 10.37/1000 population, i.e. approximately 1 % of the population. This result is based on findings from 52 published studies, and analysis shows that estimates vary according to income group of the country in which the study is performed, age-group of the study population, and study design. The prevalence of ID is higher in low- and middle-income countries, and studies based on children and adolescents also find a higher prevalence compared to studies based on adults. The meta-analysis further reports a higher prevalence of ID in cohort studies than in cross-sectional studies (Maulik et al., 2011). Carr & O'Reilly (2016) report that, of all individuals with ID, approximately 85 % fall within the mild range, 10 % are diagnosed with moderate ID, 4 % with severe ID, and 2 % with profound ID.

In Norway, Søndena, Rasmussen, Nøttestad, and Lauvrud (2000) investigated the prevalence of ID based on national registers, and estimated it to be 0.44 per 100 inhabitants. Søndena et al. (2000) did not look into the prevalence of the different degrees of ID as classified by WHO, but they did find that 17.9 % of all people with ID were reported as receiving extra care and treatment because of challenging behavior or complex needs. Further, they found a higher prevalence of ID in rural areas compared to urban areas, and they also reported a significantly higher prevalence in the northern regions of the country. The fact that Søndena et al. (2000) found a slightly lower prevalence of ID in Norway than what was found in the meta-analysis by Maulik et al. (2011) may be related to difficulties with diagnosing individuals with mild ID, as many in this group may remain undiagnosed.

### **2.1.3 Causes of intellectual disability**

Disorders of intellectual development comprise a group of disorders with diverse etiology (WHO, 2018). Traditionally, causes of ID have been categorized into biomedical factors and psychosocial factors (Schalock, 2011). Biomedical factors include known genetic or chromosomal disorders, such as Down syndrome, Rett syndrome, fragile X syndrome, etc.), idiopathic genetic conditions (i.e. no known cause), and brain damage, e.g. as a consequence of prematurity, epileptic seizures, infectious diseases, or perinatal asphyxia. Psychosocial factors may include parental substance abuse, exposure to teratogens, poverty, parental neglect and/or abuse, and lack of stimulation.

Additionally, causes of disorders of intellectual development may be classified according to the time of onset. Here, we can distinguish between prenatal, perinatal, and

postnatal risk factors. Prenatal risk factors occur during fetal development, such as maternal infectious diseases (e.g. rubella) or maternal alcohol intake. Perinatal risk factors occur in the period around birth, and include e.g. complicated delivery. Postnatal risk factors occur in the period after birth, and may include malnutrition, infections (e.g. meningitis), or traumatic brain injury (Schalock, 2011).

## **2.2 Intellectual (dis)ability as culturally conditioned: Vygotsky's pedagogical optimism**

From a medical perspective, ID is characterized by significantly below average intellectual functioning. However, as explained in 2.1.1, intelligence refers to more complex intellectual abilities than what is measured with IQ tests, and this may have profound consequences for the special educational field. Defining intelligence may be a troublesome endeavor, but Harvard College Professor in psychology Steven Pinker (2009, pp.60-62) describes intelligence as follows: 'Intelligence, then, is the ability to attain goals in the face of obstacles by means of decisions based on rational (truth-obeying) rules.' He further describes intelligence as rational, humanlike thought, and intelligent behavior as 'specifying a goal, assessing the current situation to see how it differs from the goal, and applying a set of operations that reduce the difference'. Problem-solving in order to obtain desired goals is then placed at the center of intelligent behavior. At the same time, there is increasing evidence that important intellectual abilities, such as problem-solving and goal attainment, can be acquired (Sternberg, 2005), i.e. intelligence can be apprehended as something that is to a certain extent malleable rather than something that remains constant and unalterable. This view also suggests that, with the right educational support, gradual improvements in intellectual ability may be obtained (Dweck & Master, 2012). Within a pedagogical context, this incremental view of intelligence and intellectual abilities with its growth mindset supports the idea that effort may lead to improvement and mastery, leaving more room for pedagogical action than e.g. an entity theory of intelligence, which stipulates a fixed view of intelligence (ibid.).

Vygotsky (1979) seems to embrace this incremental theory of intelligence as he on the one hand recognizes the individual neurobiological impairments that contribute to ID, but on the other hand considers the development of complex cognitive abilities, such as problem-solving and planning, as the consequence of interaction between the child and its environment. For children with ID, the development of cognition may then be hampered when the child's surroundings fail to adapt to the neurobiological foundation of that child. When there is congruence between a child's natural lines of development (i.e. the neurobiological development of the child) and the social conditions for development (i.e. the learning environment), educators may help to avoid secondary deficits in the child's cognitive development. Thus, Vygotsky postulates, cognition is not situated in the individual alone, but it is also culturally conditioned, and this makes way for optimism within a special education context. Vygotsky's understanding of ID is further elucidated in the third paper of this thesis (Garrels & Arvidsson, 2018).

This culturally conditioned understanding of ID is also found in the American Association on Intellectual and Developmental Disabilities (AAIDD), as it posits that ID is evidenced by a poor ‘fit’ between the individual’s capacities and the context in which the individual must function. This becomes particularly clear in the classification of ID that is presented by AAIDD (Schalock et al., 2010), where ID is described not solely based on impairments in intellectual and adaptive functioning, but also through the support needs of the individual. ID is then not classified according to the level of individual impairments in intellectual and adaptive functioning as is the case in ICD-11 (WHO, 2018), but instead, AAIDD categorizes ID into four levels based on the intensity of support that the individual requires to function in everyday life (from intermittent to pervasive support). Thus, this categorization shifts focus away from individual impairment and towards contextual supports that enhance individual functioning. It is then posited that the individual’s level of life functioning will improve if appropriate personalized supports are provided over a sustained period of time.

## **2.3 How intellectual disability is understood in this study**

Despite an overarching ideology of an inclusive school for all, research indicates that Norwegian students with ID generally receive their education in segregated special education classrooms or schools (Wendelborg & Tøssebro, 2010). This may be a reflection of the challenges faced by educators to accommodate their teaching to a diverse group of students, but, ultimately, it may also indicate an understanding of ID as a fixed trait within the student, i.e. an individual characteristic of the student that education cannot remediate. Such a one-sided medical understanding may be encouraged by how the diagnostic process is conducted, as this process rarely seems to take into consideration the social-ecological foundation of ID. When focusing merely on capacity and not on support provision in the assessment and understanding of ID, the intellectual and adaptive impairment soon becomes an individual problem. When transferred to a school context, such an understanding may undermine educational efforts, as it can generate low expectations towards the learning potential of students with ID.

This thesis wishes to posit a more balanced and optimistic framework for ID. The underlying understanding of ID in this thesis acknowledges the impairments in intellectual and adaptive functioning that are specified in the medical definition of disorders of intellectual development, as described in ICD-11 (cf. 2.1.1). Individuals with ID have, for a variety of reasons, a different neurobiological constitution than their typically developing peers, and this may affect their cognitive and adaptive functioning. Yet, an important foundation for this thesis is the understanding of intelligence as something that is in part culturally conditioned and therefore malleable. Vygotsky views the development of higher cognitive abilities as a consequence of adequate relational interaction between the child’s neurobiological development and its socio-cultural environment. This theoretical underpinning suggests that cognitive abilities can be enhanced through adequate educational

practices, despite the neurobiological impairments that characterize ID. In line with this Vygostkian perspective, AAIDD highlights the need for tailored supports in order to meet the specific challenges that individuals with ID encounter when there occurs a gap between individual capacity and contextual demands. Educational accommodations play then a central role in bridging this gap, as such accommodations can help students augment their capacities, and at the same time adjust the contextual demands to the students' neurobiological impairments. This gap between individual capacity and contextual demands becomes then a space for educational intervention and development opportunities. Thus, this doctoral thesis emphasizes the social-ecological understanding of ID, and thereby also the pedagogical responsibility that special educators hold towards their students with ID, namely to accommodate special education to allow for optimal learning..

# 3 Self-determination, goal-setting, and student-directed learning

In this chapter, central constructs in this thesis are defined, and the relationship between these constructs is discussed. Further, the reason for the choice of theoretical framework on self-determination is stated, and a brief overview of previous research in the field is provided. Gaps in the knowledge base are identified in order to provide a rationale for the research questions of the thesis.

## 3.1 Construct definitions

### 3.1.1 Self-determination

Since the early 1990s, self-determination has taken a central place in special education and disability research. Since that time, the construct has also been conceptualized and redefined numerous times, and several theories that explain the construct exist. Some of the most influential theories are self-determined learning theory (also known as self-regulation theory) (Mithaug, 2003), functional theory of self-determination (Wehmeyer, Kelchner & Richards, 1996), self-determination theory (Ryan & Deci, 2002), and causal agency theory (Shogren et al., 2015:a). A visual overview of these theories is provided in figure 1.

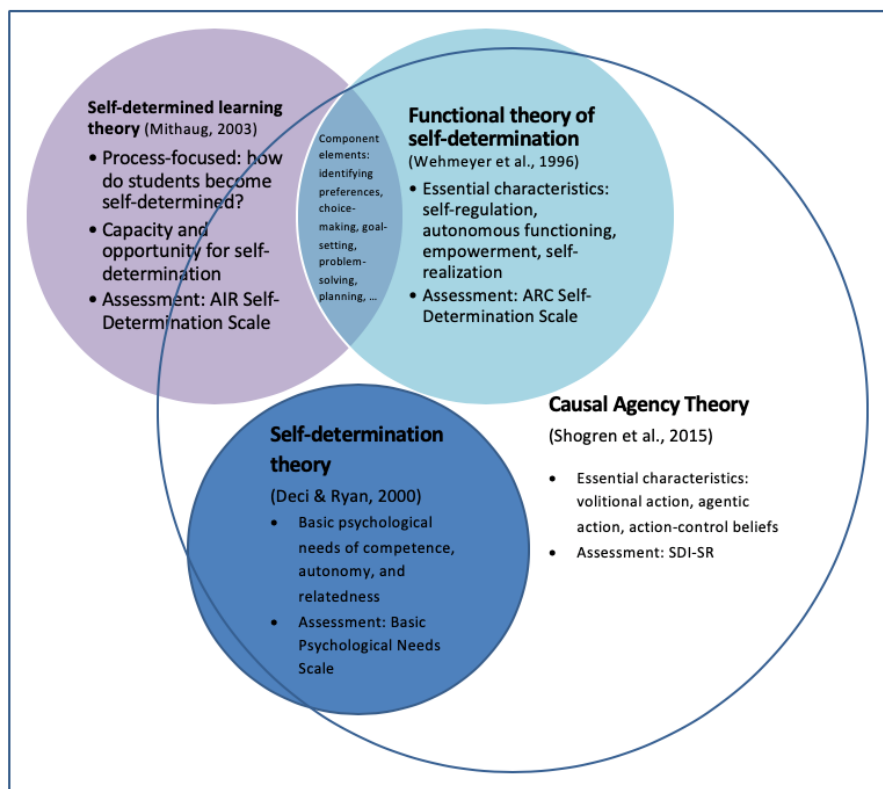


Figure 1. Overview of theories of self-determination.

Each theory is explained in some detail underneath. However, it should be emphasized that the self-determination construct is complex and highly intricate, and an overview of self-determination theories in this thesis necessarily implies a simplification of these theories. For a more complete discussion of each of the theories, the reader is advised to consult the original works that are referenced in this thesis.

One of the earliest theories of self-determination is Mithaug's (2003) *self-determined learning theory*, which focuses on the processes that lead students to become self-determined learners. This theory suggests that self-determination depends on students' capacities and opportunities for self-determination, where students will pursue those opportunities that may lead to desired outcomes (i.e. personally relevant goals). In pursuing such opportunities, students learn to adjust and regulate their thoughts, feelings, and actions, and they become self-determined learners. Self-determined individuals will set appropriate goals and expectations for themselves, and they make choices and plans in pursuit of these goals, without undue influence from others (Wolman et al., 1994). According to this self-determined learning theory, self-determined individuals learned to be that way, because they know how to take advantage of opportunities for self-determined gain, and this frequent adjustment to opportunities for self-determination enhances in turn their capacity for self-determination (Mithaug, 2003). While self-determination in this theory is not understood as an innate characteristic, it is considered a consistent trait in the individual, as self-determined individuals show a persistent tendency to seek out opportunities that will lead to their desired goals. Based on this understanding of self-determination, the construct can be assessed by means of the American Institute for Research (AIR) Self-Determination Scale, which measures the individual's capacity and opportunity for self-determined behavior skills, such as identifying preferences, goal-setting, planning, and evaluating. The psychometric properties of this scale were tested and validated in a study with 450 students, and this measure also showed adequate reliability and validity (Wolman et al., 1994).

The self-determined learning theory overlaps to a certain extent with the *functional theory of self-determination* (Wehmeyer et al., 1996). Within this functional theory, self-determination is defined as 'acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference' (Wehmeyer et al., 1996, p.632). Four essential characteristics of self-determined behavior are identified within this theory: self-regulation, autonomous functioning, psychological empowerment, and self-realization. These essential characteristics emerge through the acquisition of a number of component elements of self-determined behavior, such as choice-making skills, problem-solving skills, goal-setting and goal attainment skills, self-evaluation, and self-advocacy (Wehmeyer et al., 2007). These component elements overlap with the skills that are considered essential for self-determined behavior according to the self-determined learning theory (Mithaug, 2003). Based on this functional theory of self-determination, the ARC Self-Determination Scale was developed (Wehmeyer & Kelchner, 1995). This measure has four subscales, one for each of the essential characteristics identified

in the theory. The ARC Self-Determination Scale was validated for use with adolescents and adults with intellectual and developmental disabilities, and the instrument showed adequate reliability and validity (Shogren et al., 2008). Yet, according to Wehmeyer (2005), the functional theory of self-determination may have caused misunderstandings about what it means to be self-determined, as it could be interpreted in such a way that self-determination is about having control over one's life, which could suggest that self-determination is not obtainable for individuals with extensive support needs.

*Self-determination theory* (Ryan & Deci, 2002) is a psychological theory that aims to explain human motivation. Within self-determination theory, three basic psychological needs for well-being are identified, namely competence, autonomy, and relatedness. The need for competence is closely related to the concept of self-efficacy, and reflects the need to experience that one can effectively realize desired outcomes (Reis, Sheldon, Gable, Roscoe & Ryan, 2000). The need for autonomy is fulfilled when there is consistency and congruence between one's actions and one's self, i.e. the individual experiences his or her activities as self-determined. The need for relatedness involves feeling close and connected to significant others (ibid.). These needs are considered innate and universal to all human beings. Individuals are then thought to show an intrinsic or self-determined motivation for actions that fulfill the basic psychological needs, i.e. they will experience volition and psychological well-being in the pursuit of actions that foster these needs. Several instruments exist to assess different constructs within self-determination theory, the most relevant one possibly being the Basic Psychological Needs Scale (BPNS) (Deci & Ryan, 2000). This scale includes 21 items, and it assesses the extent to which individuals experience satisfaction of the three basic psychological needs of competence, autonomy, and relatedness.

The most recent definition of self-determination is found in *Causal Agency Theory* (Shogren et al., 2015:a). Causal Agency Theory is an extension of the functional model of self-determination (Wehmeyer et al., 1996), but it also relies significantly on Deci and Ryan's (2002) self-determination theory (Shogren et al., 2017:a). According to Causal Agency Theory, self-determination is defined as a 'dispositional characteristic manifested as acting as the causal agent in one's life. Self-determined *people* (i.e. causal agents) act in service to freely chosen goals. Self-determined *actions* function to enable a person to be the causal agent in his or her life' (Shogren et al., 2015:a, p.258). According to this definition, self-determination is an enduring tendency within the individual to act or think in a particular way, even though contextual variance is accounted for. Causal agency suggests that it is the individual who makes things happen in order to accomplish a desired outcome. Within this definition, three essential characteristics of self-determined action are identified: i) volitional action (i.e. making conscious and intentional choices based on individual preferences), ii) agentic action (i.e. self-regulated and self-directed actions that enable a person to progress towards freely chosen goals), and iii) action-control beliefs (i.e. a sense of personal empowerment or self-efficacy). It is then postulated that self-determination develops across the lifespan, as the individual develops and acquires multiple, interrelated skills, referred to as component elements of self-determination, such as identifying preferences, problem-solving, decision-making, goal-setting and goal attainment, self-management, self-regulation, and self-

advocacy (Shogren et al., 2015:a). Thus, according to Causal Agency Theory, self-determination is considered an individual trait or a relatively stable pattern of behavior, for which the foundations are laid during childhood. This most current understanding of self-determination has led to the development of a new measure of self-determination, namely the Self-Determination Inventory: Student Report (SDI-SR) (Shogren et al., 2017:b). The psychometric reliability and validity of this tool was recently validated in a study by Shogren et al. (2017:b), and the instrument has been used in an extensive study with 4,165 students in order to explore the effect of disability, race-ethnicity, and socioeconomic status on self-determination (Shogren, Shaw, Raley & Wehmeyer, 2018:a).

While all of the abovementioned theories consider self-determination as a psychological trait within the individual, Mithaug's (2003) self-determined learning theory stands out by its emphasis on how self-determination develops within the individual. Self-determined learning theory is process-focused and takes to a larger extent into consideration the environmental impact on the development of self-determination, as it accentuates the importance of exposure to opportunities to practice self-determined behavior. This becomes even clearer when looking into the AIR Self-Determination Scale (Wolman et al., 1994), a self-determination measure based on Mithaug's self-determined learning theory. Indeed, the AIR Self-Determination Scale does not only assess individual ability and performance, but it also measures how 'self-determination friendly' the individual's environment is perceived, thus acknowledging the role of interaction between capacity and opportunity for the development of self-determination. This makes the instrument appropriate not only for measuring the effects of self-determination interventions at the individual level, but also at the level of the environment. Although it can be argued that the newest theory on self-determination, i.e. Shogren et al.'s (2015:a) Causal Agency Theory, also presumes contextual variance in the form of socio-contextual supports and opportunities, this aspect is less visible in the assessment of self-determination with the Self-Determination Inventory: Student Report (Shogren et al., 2017:b), which is based on Causal Agency Theory (Shogren et al., 2015:a). The Self-Determination Inventory: Student Report focuses on the assessment of how self-determined a person tends to think and act, i.e. an assessment of individual behavior, while the interaction with the person's environment and the environmental opportunities to perform self-determined behavior remain unassessed. Thus, while the theory emphasizes the importance of context for the development of self-determination, the respective instrument does not take this aspect into particular consideration in its assessment of self-determination. This is also the case for the ARC Self-Determination Scale (Wehmeyer & Kelchner, 1995), which is based on Wehmeyer et al.'s (1996) functional theory of self-determination. The ARC Self-Determination Scale assesses personal characteristics that are deemed typical of self-determined behavior, but the role of opportunities in the environment and contextual supports remains unassessed.

This brief evaluation of self-determination theories and their respective instruments allows us to conclude that the way self-determination is understood in Mithaug's (2003) self-determined learning theory and the way it is measured with the AIR Self-Determination Scale (Wolman et al., 1994), is most in line with how the concept of self-determination is



understood in Norway. Norwegian disability researchers discuss at length the role of interpersonal relations and contextual supports in the process of becoming self-determined (see the first paper in this thesis for a further discussion of this), and the interaction between the individual and his or her environment becomes essential in the Scandinavian understanding of self-determination. Therefore, this thesis uses self-determined learning theory (Mithaug, 2003) as a theoretical framework for how to understand and enhance self-determination in students with mild ID, and this also guides the choice of instrument used in this doctoral thesis, namely the AIR Self-Determination Scale (Wolman et al., 1994).

### **3.1.2 Goal-setting**

Within each of the aforementioned theories of self-determination, goal-setting plays a crucial role. Causal Agency Theory (Shogren et al., 2015:a) states that self-determined people *act in service to freely chosen goals*. Thus, the skills that are required to set personally relevant goals and to initiate action towards goal attainment are considered necessary conditions for self-determined behavior according to this theory. The functional theory of self-determination highlights self-realization as an essential characteristic, and being able to volitionally pursue goals for one's personal development (causal agency) is central to this theoretical perspective (Wehmeyer, 2006). Likewise, Deci and Ryan's (2002) self-determination theory recognizes goal-setting as an important skill in its description of the basic psychological need for competence, as this need relates to realizing desired outcomes (or goals). Yet, it is first and foremost in Mithaug's (2003) self-determined learning theory that goal-setting and goal attainment are ascribed a key role in the process of how self-determination develops. Thus, while goal-setting lies at the core of being self-determined in Causal Agency Theory, in the functional theory of self-determination, and in Self-Determination Theory, it is in the self-determined learning theory that goal-setting becomes central to the *development* of self-determination.

The process of goal-setting and goal attainment has been described in detail by Latham and Locke (2013), who state that life itself is a process of goal-produced action. In their goal-setting theory, Locke and Latham (2006) describe goal-directed action as an essential aspect of human life, and they posit that setting goals provides people with a sense of purpose. This 'sense of purpose' that is experienced when setting and attaining personally relevant goals shows certain similarities with being self-determined. The continuous process of setting goals and goal pursuit is what drives human behavior, as individuals identify a productive discrepancy between a present situation and a desired situation, and figure out how to overcome this discrepancy. This life-long process of goal-directed action is similar to how Mithaug (2003) describes the process of becoming self-determined, namely through the identification of opportunities for self-determined gain in the environment and by acting upon these opportunities. Thus, goal-setting is an important element of self-determined behavior, but it is also what drives human behavior in general. The psychology of goal-setting and how it influences human performance is elaborated on in more detail in the second paper of this thesis (Garrels, 2017).

Within an educational context, goal-setting lies at the heart of learning in general, as academic achievement is generally goal-driven. Teacher and student efforts in the classroom are largely directed by goals that are identified as essential for the student's personal and academic development. Yet, this goal-orientation may have a somewhat "American" character for Norwegian educators, and they may experience the focus on goal-setting as untypical for the Scandinavian educational context. Economy professors Matthias Doepke (Northwestern University) and Fabrizio Zilibotti (Yale University) explain this as cultural differences that originate in the countries' different economical situations, as they found that countries with high income inequality and weak social safety nets (such as e.g. USA and China) tend to promote a competitive educational style, whereas schools in highly egalitarian societies (such as the Scandinavian countries) tend to put low pressure on students and they emphasize instead teamwork and horizontal teaching methods. Thus, in the Scandinavian countries, there is little tradition for achievement-oriented values, and the school system is characterized by a laid-back approach to education and low competition (Doepke & Zilibotti, 2019). Therefore, Norwegian educators may frown upon classroom interventions that aim to promote goal-setting skills for their students. This becomes also evident from the results presented in the second paper of this thesis (Garrels, 2017), which indicate that, while approximately two thirds of the students in the study reported that they could actively engage in goal-setting processes at school, 38% of all students reported that they rarely or never felt encouraged to set goals for themselves. In this study, no significant differences were found between students with and without ID, suggesting that the findings may be typical for mainstream and special education.

However, a focus on goal-setting does not necessarily imply a competitive educational style, and even with a preference for naturalistic teaching approaches (such as e.g. learning through play), educators nonetheless hold overarching learning goals for their students based on the national curriculum. Thus, goal-setting largely guides students' learning processes and activities. Here, student-directed learning, where students are given the opportunity to identify personally relevant goals for themselves, may be more in line with the Scandinavian educational culture, as student-directed learning can be considered as a type of horizontal teaching-method, where students and educators become partners in the learning process.

Furthermore, it is important to acknowledge that goal-setting skills are not innate, but instead, they are skills that need to be learned. For students with ID, it may be even more crucial to learn these goal-setting skills. Persons with ID may frequently depend on help from others in their daily life activities, and this increases their risk of being subjected to goals set by others. Such goals may not necessarily be experienced as personally relevant, and consequently, the person with ID may experience low causal agency and self-determination. Thus, for students with ID, goal-setting interventions may be especially relevant, and student-directed learning may be an appropriate way of teaching goal-setting skills.

### **3.1.3 Student-directed learning**

Student-directed learning has been suggested as a powerful means of enhancing the self-determination of students with ID (Wehmeyer, 2003; Wehmeyer & Shogren, 2017). Student-directed learning implies that students are actively involved in their own learning processes, by identifying personally relevant learning goals, developing action plans, self-monitoring, and self-evaluation (Wehmeyer, 2003). The emphasis in student-directed learning strategies is shifted from teacher-directed to student-directed instruction, where teachers still play a central role as instructor and facilitator, but students are no longer passive recipients. Instead, students become active agents in their own education, and Coon and Walker (2013) refer to this as ‘educational citizenship’. Such agentic agency within the educational context provides students with iterative opportunities to practice different component elements of self-determined behavior, as described in the abovementioned theories on self-determination. Student-directed learning may therefore be an important tool for educators to infuse their teaching with opportunities for students to practice self-determination skills.

Student-directed learning may further play an important role in students’ motivation for school work, as the active involvement in educational processes may fulfill the basic psychological need of autonomy (Reeve, 2002). If students perceive a personal relevance and ownership of their academic goals, they may be more likely to develop an intrinsic motivation for these goals, and hence, they may also become more persistent and enduring in their goal pursuit (Guay, Ratelle & Chanal, 2008). Student-directed learning may thus provide an important pathway to enhanced school performance and increased self-determination. A study by Garrels (2018:a) found for example that students with ID improved their reading and writing skills during a student-directed learning intervention in which they could work on self-chosen academic goals. But student-directed learning can also be used for non-academic goals. For instance, a case study conducted by Garrels (2018:b) shows how student-directed learning was successfully used by a student with autism spectrum disorder and ID in order to improve social conversation skills. Thus, student-directed learning may be used for different goals (academic and non-academic) and different outcomes (long-term self-determination and/or short-term goal attainment and motivation), and it is also possible to implement student-directed learning with students with ID.

## **3.2 Brief overview of research on self-determination, goal-setting interventions, and student-directed learning for students with intellectual disability**

Self-determination is considered an important developmental outcome for students with disabilities, and, since the early 1990s, a significant amount of research articles and books has been published on the topic. Until the turn of the century, most of the research was theoretical and conceptual, while the empirical body of evidence has been slower to accumulate (Shogren et al., 2008). Yet, several studies have now explored the association between self-

determination, academic goal attainment, and positive post-school outcomes. While many of these research studies use samples of participants with very diverse disabilities (from orthopedic disabilities to sensory disabilities to high-incidence disabilities such as ADHD), fewer studies have focused on participants with ID, and they are often characterized by small sample sizes, which makes conclusions tentative. Still, the body of evidence about the importance of self-determination for individuals with ID is growing. It is then also in place to look into research studies on goal-setting interventions and student-directed learning, as these may provide effective strategies to enhance students' self-determination skills.

### **3.2.1 Self-determination and post-school outcomes**

Lachapelle et al. (2005) explored the correlation between self-determination and quality of life in a sample of 182 adults with mild ID. Here, self-determination was measured with the ARC Self-Determination Scale, while quality of life was assessed with the Quality of Life Questionnaire (Schalock & Keith, 1993). Results from this study indicated that each of the essential characteristics of self-determination predicted membership in the high quality of life group. Lachapelle et al. (2005) interpret these findings as higher levels of self-determination contributing to enhanced quality of life, but as this is a cross-sectional study, it cannot provide information about the directionality of the relationship. Contradictory to the findings of Lachapelle et al. (2005), Miller and Chan (2008) also used the Quality of Life Questionnaire (Schalock & Keith, 1993) in a study with 56 participants with ID, but found that self-determination was not significantly associated with life satisfaction. These contradictory findings suggest the need for more research with larger sample sizes to explore the relationship between self-determination and life satisfaction/quality of life further.

Martorell and colleagues (2008) assessed the self-determination of 179 adults with ID (as measured by the ARC Self-Determination Scale), and explored its relation to work outcomes. This study found a significant positive correlation between self-determination and work outcomes, where participants in sheltered employment programs (i.e. economically productive workers) showed higher levels of self-determination than participants who were in occupational centers. In this study, it is assumed that self-determination is a predictor of positive work outcomes, but the authors do acknowledge that the research design of the study does not allow for such causal inferences. A longitudinal study by Shogren, Wehmeyer, Palmer, Rifenbark & Little (2015:b) provides more evidence for the directionality of the relationship between self-determination and employment. In this study, the ARC Self-Determination Scale was used to assess the self-determination of 779 students (of whom 30 % with ID) in the final year of high school, and adult outcomes were measured by means of a survey one-year post-school. Findings from this study suggest that self-determination status when exiting high school predicts employment outcomes, thus indicating a certain directionality between the two variables.

Self-determination seems further associated with participation in recreational activities for secondary students with ID. McGuire and McDonnell (2008) assessed the self-determination of 34 students with the ARC Self-Determination Scale, and tracked their

involvement in recreation over a two-week period. Findings from this study suggest a positive correlation between self-determination and time spent in recreation.

Shogren and Shaw (2016) used data from a large-scale longitudinal study to explore the relationship between three essential characteristics of self-determination (i.e. autonomy, self-realization, and psychological empowerment, each of them measured with the subscales of the ARC Self-Determination Scale) and desirable post-school outcomes such as employment, financial independence, social relationships, independent living, and postsecondary education. Findings from this study suggest that, for those with ID, there is evidence for a positive correlation between autonomy and inclusive residential opportunities.

Despite the limited number of research studies focusing on the relationship between self-determination and positive post-school outcomes for individuals with ID, there is mounting evidence to support the promotion of self-determination for this group. More research is needed to further explore the important long-term role that self-determination may play in the lives of individuals with ID. Such research should not only try to establish correlations between self-determination and other variables, but it should also aim to inform about the directionality of any such relationships. This requires longitudinal or experimental design studies.

### **3.2.2 Self-determination within the school context: the role and benefits of goal-setting interventions and student-directed learning**

Self-determination has been linked to several positive post-school outcomes, but it may also play a role in the academic goal attainment of students with ID. Thus, the concept may be of interest for students' academic performance during the school years as well as for long-term post-school outcomes. Erickson, Noonan, Zheng, and Brussow (2015) investigated the relationship between self-determination and academic achievement in a sample of 480 adolescents with ID. In this study, self-determination was measured with a modified (shorter) version of the ARC Self-Determination Scale, whereas academic achievement in mathematics and reading was assessed with the Woodcock-Johnson Research Edition (Woodcock, McGrew & Mather, 2007). Structural equation modelling identified a strong and positive correlation between self-determination and academic achievement even after controlling for covariant variables such as family income or gender. Similar results were found in a study by Zheng, Erickson, Kingston, and Noonan (2014), who explored correlations between self-determination, self-concept, and academic achievement in a sample of 560 students with learning disabilities. Zheng and colleagues (2014) found that self-determination may be a potential predictor of academic achievement for students with learning disabilities.

A literature review by Guay, Ratelle, and Chanal (2008) found that the activation of intrinsic educational goals, i.e. when students experience a certain degree of autonomy or self-determination in their choice of educational goals, leads to positive behavioral and cognitive outcomes, such as more persistence, a preference for optimal challenge, and higher academic achievement. Thus, teachers who support student autonomy and who give students a central

role in their own learning processes, e.g. through student-directed learning, may play a significant role in the development of student motivation. Moeller, Theiler, and Wu (2012) also highlight in an unsystematic literature review on goal-setting interventions that, when students can attach personal value to academic goals, they will experience school work as more purposeful, and hence, they will be more willing to meet the cost of achievement. Thus, there may exist a positive interaction between autonomous goal-setting and student-directed learning on the one hand, and the development of intrinsic motivation and self-determination on the other hand. This interaction is further explored in the theoretical background of the second paper of this doctoral thesis (Garrels, 2017).

Despite increasing evidence to support self-determination as an important educational goal for students with ID, a survey performed by Wehmeyer, Agran and Hughes (2000) found that, while a majority of teachers finds instruction in self-determination important, approximately one-third of the 1,219 respondents reported that none of their students had self-determination goals in their individual education plans (IEP). Findings from the survey further indicated that teachers who worked with students with more severe disabilities rated instruction in the different self-determination skills as less important than teachers of students with mild disabilities. 41 % of the teachers in the study reported that they did not have sufficient training or information on how to teach self-determination skills to their students. Cho, Wehmeyer and Kingston (2011) found similar results in their survey of 407 elementary teachers' knowledge and use of interventions to promote self-determination. This survey suggests a lack of congruence between the value teachers place on promoting self-determination and the time they devote to teaching it. Approximately one-third of the respondents identified a lack of knowledge as to how to teach such skills as a barrier to promoting self-determination, and 60 % of the special educators in the sample reported that their students had more urgent needs in other areas.

Based on the body of evidence for the benefits of self-determination for individuals with disabilities in general, and with research studies suggesting that educators lack the necessary knowledge to teach self-determination skills to their students with disabilities, several intervention programs to promote self-determination skills have been developed. Algozzine, Browder, Karvonen, Test, and Wood (2001) published a meta-analysis of 51 peer-reviewed research articles published between 1972 and 2000, in which they investigated interventions that focused on components of self-determination as dependent variables. The total number of participants in the included studies was 992, and the most frequently represented disability categories were ID and specific learning disability. 25 of the included research studies used single-case experimental design studies, while the remaining 26 studies applied a group design. For the assessment of self-determination, most of the studies used a combination of validated instruments, such as the ARC Self-Determination Scale, and researcher-designed measures. Most of the studies focused on enhancing self-determination for transition-aged adolescents and adults, while only few studies used younger students in their samples. Findings from this review suggest that the most common interventions taught choice making and self-advocacy to individuals with ID. The self-determination components that were the least studied were self-advocacy and self-efficacy, and between 1972 and 2000,

few studies focused on goal-setting and goal attainment skills. Algozzine and colleagues (2001) found support that multicomponent interventions, i.e. interventions that focus on several self-determination skills simultaneously, may yield more result than single-component interventions, either because of a synergistic effect, or because of overlap between several of these self-determination skills. This finding was later replicated in a narrative metasynthesis by Cobb, Lehmann, Newman-Gonchar, and Alwell (2009).

The most recent meta-analysis of interventions to promote self-determination for students with disabilities was conducted by Burke and colleagues (2018). This meta-analysis includes 34 peer-reviewed research articles published between 2000 and 2017, and provides thus a follow-up of the meta-analysis from Algozzine et al. (2001), which included research studies from 1972 to 2000. Ten of the articles reported on single-case experimental design studies, while the remaining 24 studies used a group design. 27 of the studies targeted multiple components of self-determined behavior, while the remaining seven studies were single-component interventions. Approximately one-third of the studies used validated measures of self-determination (such as the AIR Self-Determination Scale), whereas the remainder used either researcher-created measures or validated measures that assessed one or more skills associated with self-determination. 23.5 % (n = 726) of all participants included in the different intervention studies were students with ID. The most frequently used intervention program was the Self-Determined Learning Model of Instruction (SDLMI), which was used in 12 of the studies, followed by Whose Future Is It Anyway (n = 4 articles), Self-Advocacy Strategy (n = 3 articles), and NEXT S.T.E.P. Curriculum (n = 3 articles). The Self-Determined Learning Model of Instruction (Wehmeyer et al., 2000) is an instructional model that uses student-directed learning to teach skills associated with self-determined behavior, such as identifying preferences, goal-setting, planning for goal attainment, self-management, and self-evaluation. Whose Future Is It Anyway (Wehmeyer et al., 2004) is an intervention program that promotes student involvement in educational and transition planning. The program is developed to be used by teachers in secondary school, and consists of 36 sessions that introduce students to the concepts of transition and transition planning. The program focuses amongst others on teaching students to make decisions, to identify transition goals, and to self-advocate. Self-Advocacy Strategy (Van Reusen, Bos, Schumaker & Deshler, 2007) helps students prepare for and participate in transition planning meetings by teaching them how to identify strengths and support needs and education and transition goals. NEXT S.T.E.P. (Halpern, Herr, Doren & Wolf, 2000) helps students take charge of their own transition planning process. The program contains 16 lessons and has a strong focus on selecting and implementing transition goals. Major findings from this meta-analysis include that there is an increase in the number of participants in self-determination intervention studies, with a considerable increase in the number of group design studies as compared to what Algozzine et al. (2001) found in their meta-analysis. Further, all studies suggested positive outcomes on self-determination, either on overall self-determination or on specific component skills of self-determination. Burke et al. (2018) identify several weaknesses in the research body that is at hand, such as e.g. the use of researcher-developed measures across a number of the studies. Also, only 18 of the studies included sufficient information to calculate

effect sizes, and this limits the degree to which effects can be analyzed across studies. Burke et al. (2018) further suggest a need for improved rigor in reporting quality of research, especially implementation fidelity.

A comparison of the first meta-analysis by Algozzine et al. (2001) and that of Burke et al. (2018) suggest that researchers since the turn of the century have contributed with more large-scale group design studies to explore the effects of self-determination interventions. Also, while Algozzine et al. (2001) found that many of the research studies focused on single components of self-determination, and that there were only few studies that focused on goal-setting and goal attainment skills, this issue seems to have been addressed in research studies from 2000 until now, where most of the self-determination intervention programs focus on helping students to identify and attain educational and transition goals. Self-determination interventions that include a goal-setting component will almost automatically target several self-determination skills simultaneously, as goal-setting and goal attainment involve multiple self-determination skills, such as identifying preferences, making choices and decisions, planning, and self-monitoring.

Burke et al. (2018) found that the SDLMI, which is a multi-component goal-setting intervention that addresses multiple self-determination skills, was the most frequently implemented intervention program. The SDLMI uses student-directed learning as a means for teaching students self-determination skills, as students get to identify and work with personally relevant goals. There is increasing evidence for the efficacy of the SDLMI as an intervention to promote self-determination and academic goal attainment, and this is also the intervention program that was used in this doctoral intervention study. Lee, Wehmeyer and Shogren (2015) conducted a meta-analysis of 15 single-subject research studies, and they calculated a percentage of non-overlapping data metric (PND) to explore the effect of the SDLMI on academic and functional goal attainment for students with disabilities. The overall PND mean score was 79.8 %, which suggests that the SDLMI is an effective intervention. A literature review by Hagiwara, Shogren and Leko (2017) included 21 research studies that used the SDLMI, and the authors conclude that the SDLMI offers a successful approach to teaching students self-determination. Empirical findings and social validation suggest that the SDLMI provides an efficient way to promote self-determination, as it can be implemented in relatively short time intervals, and because it can be overlaid on other curriculum areas (see 4.2.1 for more information on this).

While there is considerable research attention devoted to the promotion of self-determination in the U.S., very little research on this topic has been conducted in Norway and the Nordic countries. Indeed, several theoreticians in Norway have written about self-determination for adults with ID (e.g. Ellingsen (2007), Bjørnrå, Guneriusen & Sommerbakk (2008)), but this literature is mostly theoretical and conceptual. A literature search on ERIC and PsycInfo with the search terms ‘self-determination’ OR ‘student-directed learning’ OR ‘self-regulated learning’, ‘Norw\*’ OR ‘Nordic’ OR ‘Scandinavian’, AND ‘disabil\*’ OR ‘intellectual disabil\*’ revealed only one study apart from the ones that resulted from this doctoral study, namely the qualitative study by Sagen and Ytterhus (2014). This study



investigated how self-determination for students with ID is practiced in Norwegian secondary schools, and data were collected through qualitative interviews and observations. Findings suggest that there exists considerable variation in students' opportunities to practice self-determined behavior, and the provision of such opportunities seems random. Sagen and Ytterhus (2014) interpret these findings as indicative of teachers' lack of knowledge of and/or access to relevant pedagogical tools to promote self-determination.

While self-determination has been receiving little research attention in Norway, student participation is emphasized as an important educational principle in order to enhance students' democratic competencies (Ministry of Education and Research, 2006), and thus, self-determination may be indirectly promoted. The national curriculum for knowledge promotion in primary and secondary education and training states that students should be able to participate in the planning, implementation, and evaluation of their own education (*ibid.*), i.e. student-directed learning forms a theoretical principle for primary and secondary education. Yet, a recent national survey suggests that many teachers see student participation as time-consuming, and they experience that it takes time away from students' academic goals (Wendelborg, Røe & Buland, 2018). This may indicate that teachers lack the knowledge and strategies to interweave academic and self-determination skills in their everyday school practice. The survey further reveals that approximately 60% of all students have little or no influence on how their education is organized, and these findings are also replicated in the second paper of this doctoral thesis (Garrels, 2017), which suggests that approximately 40% of all students do not feel encouraged to set goals for themselves at school, and 60% of all students do not learn how to make plans for their personal goal attainment. Thus, despite political intentions and evidence-based benefits, student-directed learning remains a novelty in Norwegian education.

### **3.3 Gaps in the research base: What do we need to find out?**

The previous overview of the research base on self-determination identifies several gaps that researchers still need to address. While there is evidence for positive relationships between self-determination and desirable post-school outcomes such as employment (Martorell et al., 2008), independent living (Shogren & Shaw, 2016), and increased community participation (Nota et al., 2007), it is important to identify the directionality of these relationships, so that interventions can target the most effective variables. Such evidence can be obtained through longitudinal studies and randomized controlled trials. Yet, in educational research, it is also of interest to explore the benefits of self-determination supportive environments on students' academic achievements and motivation for school work. Thus, not only post-school outcomes of self-determination interventions are relevant, but also the short-term effects on students' academic performance and goal attainment. This may be especially important for the group of students with ID, for whom academic expectations often are low, and this doctoral thesis addresses this gap.

Many of the research studies on self-determination use diverse samples of students in special education. However, not all researchers report specifically which disability category their research focuses on, and this may make the generalization of research outcomes more difficult. Clearly, participants with ID may meet quite different barriers in the development of self-determined behavior compared to, for example, individuals with orthopedic impairments. This challenge is supported by findings from studies by Shogren et al. (2012) and Wehmeyer et al. (2012), who reported that students with ID had lower effects of a self-determination intervention with the SDLMI, both when it comes to outcomes such as self-determination and goal attainment. It is then important to investigate which accommodations could be useful to address the specific cognitive needs of students with ID, as their needs may differ substantially from the needs of other groups of students. Also, the group of individuals with ID is in itself very diverse, and the support needs of students with moderate or severe ID will differ from those of students with mild ID. Therefore, this doctoral thesis limits itself to the group of students with mild ID.

Further, the meta-analysis by Algozzine et al. (2001) suggested that there exist few research studies that investigate the effect of self-determination interventions on younger students, as most of the research focuses on transition-aged youth and adults. Yet, self-determination has been described as a developmental process that begins in early childhood and that continues across the lifespan (Dunn & Thrall, 2012). Palmer et al. (2012) also suggest that the basic foundation for developing self-determination in later life is laid during childhood, as children gain skills in choice-making and problem-solving, self-regulation, and engagement. It is then necessary to implement more intervention studies that target younger students, as it could be hypothesized that such early intervention may affect self-determination outcomes to a larger extent. Therefore, the target group in this doctoral study is students with mild ID in lower secondary school.

Finally, there is little research available on self-determination and student-directed learning interventions for students with ID in Norway, despite the country's strong political emphasis on empowerment for individuals with disabilities. Therefore, this doctoral thesis aims to contribute to the Norwegian and Nordic field of research in special education, by making available evidence-based interventions for Norwegian students with ID. While the political will is present to ameliorate the quality of special education in Norway, research is needed to provide interventions that may result in desired outcomes. This doctoral thesis aims then to give a contribution to the Norwegian field of special education, and for Norwegian students with ID in particular.

## 4 Presentation of the doctoral thesis

As described in chapter three, self-determination refers to causal agency and to acting volitionally based on self-chosen goals (Wehmeyer, Shogren, Little & Lopez, 2017). Thus, self-determination is about self-realization and about giving a personal direction to one's life. Yet, for Norwegian citizens with ID, giving a personal direction to one's life seems all too seldom a possibility. A Norwegian White Paper that explored national living conditions for individuals with ID found that persons with ID frequently encounter discrimination and legal disempowerment, they experience limited personal freedom and choice, they have limited possibilities for private family life, they rarely have the freedom to choose where and with whom they wish to live, they receive poor quality education, they have restricted access to specialized health care, they are largely excluded from the labor market, and the support services that they receive limit their possibilities for self-determination, inclusion, and participation in the local community (Norwegian White Paper, 2016:17). Thus, a self-determined life based on personal preferences and goals does not yet seem within reach for Norwegian individuals with ID. However, in 2013, Norway ratified the UN General Assembly's (2006) Convention on the Rights of Persons with Disabilities (CRPD), which promotes equal opportunity, non-discrimination, individual autonomy, and full and effective participation and inclusion in society. Since Norway has committed itself as a States Party to the CRPD, enhancing the self-determination for individuals with ID has become a political and educational goal (Norwegian White Paper, 2016:17). In order to contribute to this goal, this doctoral thesis deals with three research aims:

- 1) to make available a reliable measure for self-determination to be used with individuals with mild ID in Norway;
- 2) to investigate the effects of an existing instructional model for teaching self-determination skills for use with Norwegian students with mild ID;
- 3) to explore which accommodations may be useful in order to adapt the self-determination instrument and intervention model to the specific cognitive needs of students with mild ID.

The first aim of the thesis is addressed by means of a validation study of a measure of self-determination. The second aim of the thesis is explored through an intervention with an instructional model developed to promote self-determination skills. The third aim of the thesis springs from its first and second aim, as it deals with accommodations that were found useful and/or necessary to make the self-determination measure and intervention suitable for use with students with mild ID.

### 4.1 Validation of a measure of self-determination

#### 4.1.1 Instrument

For the first aim of the thesis, to adapt and validate an assessment tool for self-determination, the AIR Self-Determination Scale (Wolman et al., 1994) was chosen as the preferred

instrument. The AIR Self-Determination Scale measures students' self-determination by means of self-report, an educator form, and a parent form. The instrument consists of two subscales, one for capacity and one for opportunity. The scale is based on self-determined learning theory that explains the process by which the individual becomes self-determined. Self-determined learning theory suggests that a person becomes self-determined as he or she learns how to regulate thoughts, feelings, and actions in order to attain self-chosen goals. The opportunities provided by the environment to practice self-determined behavior play then a central role in the development of capacity for self-determination.

The rationale for choosing the AIR Self-Determination Scale in this thesis is provided by this self-determined learning theory, as it considers self-determination as the product of capacity and opportunity to practice self-determined behavior. This is in line with the Scandinavian understanding of self-determination, where the interaction between individual capacity and opportunities provided by the environment plays a main role. Further, the items on the AIR Self-Determination Scale are considered relevant also for younger adolescents with ID in lower secondary school, more so than for example the items on the ARC Self-Determination Scale (Wehmeyer & Kelchner, 1995), where the self-regulation index is directed at students transitioning to adult life. The AIR Self-Determination Scale can therefore be used to assess the effect of self-determination interventions for students in lower-secondary school. In addition, previous research has indicated that the AIR Self-Determination Scale may be more sensitive to short-term changes than the ARC Self-Determination Scale (Wehmeyer, Palmer, Shogren, Williams-Diehm & Soukup, 2013). Thus, it may be more fit for use in the intervention of this doctoral thesis. In the first study of this thesis, the student form of the AIR Self-Determination Scale was psychometrically validated, whereas the educator form was translated only. The Norwegian student form is hereafter named AIR-S-NOR, and the educator form is referred to as AIR-E-NOR. A copy of AIR-S-NOR and AIR-E-NOR can be found in attachment number five of this thesis.

#### **4.1.2 Method**

For the adaptation and validation of the AIR-S-NOR, a model of equivalence for cross-cultural validations by Herdman, Fox-Rushby and Badia (1998) was followed. This model was found to be the most comprehensive one for cross-cultural validation of instruments in a systematic review by Epstein, Santo, and Guillemin (2015). According to this model of equivalence, conceptual, item, semantic, operational, measurement, and functional equivalence of the AIR-S-NOR were investigated. Psychometric reliability, or measurement equivalence, was tested in a study with 121 students. 64 of these students (42 typically developing) underwent a second assessment two weeks later, in order to investigate test-retest reliability. Internal consistency for the scale and subscales was investigated with Cronbach's  $\alpha$ , and a principal component analysis was performed to examine the dimensionality of the scale.

### **4.1.3 Sampling procedure**

For the validation study, it was desirable to include a minimum of 100 participants so that acceptable statistical calculations could be performed on the data set (for example, parallel analysis with the Monte Carlo Principal Component Analysis Program requires at least 100 participants). While it was an overarching aim of the study to make available a self-determination instrument that could be used with adolescents with mild ID, sampling 100 students in the right age group with a diagnosis of mild ID offered practical challenges. Therefore, a pragmatic choice was made to include both students with ID and typically developing students in the sample. In order to be able to make more general statements about students with ID, it was desirable to include at least 30 participants with ID in the study. Participants were recruited by sending out e-mails with an invitation to participate to 22 randomly chosen schools in the south-east of Norway. This area was chosen for reasons of convenience, because of its geographical proximity to the researcher. E-mails were addressed to the school principal and special education coordinator where available. Principals of eligible schools then decided whether or not they were interested and/or had the available resources to participate, and passed on the invitation to the general and special educators of possible participants. Educators then sent information about the study to the students' parents, who decided whether their child could participate in the study. From the 22 schools that were contacted, 9 chose to participate, and data from a total of 87 typically developing students and 34 students with ID were collected during fall 2015 and spring 2016.

### **4.1.4 Results**

The AIR-S-NOR showed respectable psychometric properties, similar to those of the original scale. Cronbach's  $\alpha$  for the total scale and its separate subscales ranged from .75 to .89. Test-retest correlations ranged from .79 to .86. The principal component analysis supported the bi-dimensionality of the scale. In comparing the typically developing group with the group of participants with ID, a Mann-Whitney *U* Test indicated a small but significant difference between these groups, where participants with ID have significantly lower levels of self-determination than their typically developing peers. A detailed description of the validation process and its psychometric results is described in the first paper of this thesis (Garrels & Granlund, 2018). The second paper of the thesis (Garrels, 2017) reports on findings from the assessment with AIR-S-NOR; more particularly, this paper looks into specific self-determination skills of Norwegian students with and without ID. Findings from this paper suggest that approximately one third of the students in the sample feel encouraged to set goals for themselves at school, but a similar proportion of participants also report that they do not learn how to make plans for goal attainment at school. No significant differences were found between students with ID and typically developing students (Garrels, 2017).

## **4.2 A self-determination intervention**

### **4.2.1 Description of the independent variable**

For the second aim of the study, namely an investigation of the applicability of an instructional model to enhance student self-determination, the tool of choice was the Self-Determined Learning Model of Instruction (SDLMI) (Wehmeyer et al., 2000). The SDLMI is a student-directed model of instruction that enables educators to teach their students different component skills of self-determination, such as how to identify preferences, make choices, set and attain goals, as well as how to evaluate outcomes. These are largely the same skills that are assessed with the AIR Self-Determination Scale. The SDLMI consists of three phases, where each phase introduces a problem that the student needs to address: 1) ‘What is my goal?’, 2) ‘What is my plan?’, and 3) ‘What have I learned?’. Within each phase, the student is asked to identify supports and barriers that may contribute to or hinder goal attainment, thus learning how to interact with the environment to achieve the desired outcome. All phases are conversation-based, i.e. the questions are not administered as a fill-out form, but they are meant as conversational support for the teacher and student (Wehmeyer et al., 2000). The SDLMI is an evidence-based model that has shown promising results in several research studies, such as increased levels of self-determination (Wehmeyer et al., 2012), increased goal attainment and access to the general curriculum (Shogren et al., 2012), and improved teacher perception of students’ capacity for self-determination (Shogren, Plotner, Palmer, Wehmeyer & Paek, 2014). However, these studies also suggest that interventions with the SDLMI have smaller effects for students with ID than for other students, such as e.g. students with learning disabilities.

There are three main reasons for choosing the SDLMI as the preferred model for the intervention in this doctoral study: 1) the SDLMI is an evidence-based model of instruction, 2) since the model can be overlain the ordinary curriculum, its user-friendliness is expected to appeal to educators, and 3) the model can be used with younger students, e.g. students in lower-secondary school.

### **4.2.2 Study design**

For the intervention with the SDLMI, a single-case experimental design with multiple baselines across cases was used. In order to meet evidence standards for single-case experimental design studies, guidelines from What Works Clearinghouse (Kratochwill et al., 2010) were followed. These guidelines comprise four criteria: 1) the independent variable must be systematically manipulated, i.e. the intervention must be applied with fidelity to method for each of the cases; 2) each outcome variable must be assessed systematically over time by more than one assessor, and interobserver agreement must be based on at least 20 % of the data points of both baseline and intervention phase; 3) the study must include at least three attempts to demonstrate an intervention effect, thus, for a multiple baseline study there should be a minimum of at least three baselines; and 4) each baseline and intervention phase must have at least three data points.

The research design for the intervention was first tested in a pilot study with two students with ID and their teachers. Then, six lower-secondary school students (aged 13-16 years old) with mild ID and their three teachers participated in the actual intervention study. All students in the intervention study attended the same special education school (in two different classes), and all had individual education plans. During the intervention, the students used the SDLMI to set three subsequent goals, first a goal in reading and writing skills, then a goal in mathematics, and then a goal within a freely chosen school subject. The first round with the SDLMI was led by the researcher, but with the teachers attending most of the conversations with the students. In the second round, teachers took a more active role in helping their students to set goals for themselves and to develop action plans to attain their goals. For practical reasons, teacher involvement did vary again in the third round of goal-setting

For the intervention's multiple baseline design, the continuous measure was based on the students' individually chosen goals. In total, 15 of the student goals were measured in a continuous baseline design. Furthermore, a pre-post assessment with the AIR-S-NOR and AIR-E-NOR was performed before intervention start, and after the intervention, i.e. approximately three months later. After the intervention, qualitative interviews with students and teachers were performed for social validation.

To help the students formulate a goal of their choice, all students had individual conversations with the researcher and in most cases, the students' teachers were also present during these conversations. To help students in the goal setting process, the pre-phase of the SDLMI was used, where students can explore personal interests and preferences. The researcher then directed the conversation towards the academic area where the student was to define a goal. Students were asked questions about what they already knew within the specific academic area, what they were good at, and what they wanted to learn. Apart from one student with an additional autism spectrum disorder diagnosis, students did not seem to encounter serious difficulties in providing answers to the questions in the pre-phase. Most students were capable of giving detailed descriptions of their challenges in the different academic areas. For example, one student identified how she struggled with reading aloud longer words, and that her coping strategy was to come up with a nonsense word instead, as she did not feel confident enough to ask her teacher for help.

After identifying needs and interests, the researcher helped students to summarize the essence of their challenges. This paraphrasing of the situation enabled students to formulate specific goals for themselves. In some cases, the students did require help to narrow down their goals, so that goals could be attained within a one- or two-week course. Also, it was essential for the research study that as many of the goals as possible could be evaluated by means of a continuous measure, so in some cases the researcher needed to assist more in how the goal would be formulated. However, care was taken not to divert from the student's original goal, and therefore, some of the goals were not evaluated by means of a continuous measure.

Students then developed action plans for how they could attain their chosen goals. In this phase of the SDLMI, students were asked to identify supports and barriers in the environment that could help them or keep them from attaining their goals. Further, the researcher helped students identify the necessary educational supports that could help them reach their goals. While the SDLMI is a student-directed model of instruction, it is important to be aware that students will still rely on the pedagogical and didactical expertise of their teachers, and especially when students have no prior experience with developing action plans, educators play a crucial role as facilitator. In the current study, students were involved in this part of the goal attainment process by exposing them to different kinds of educational strategies from which they could choose. For example, for a student wanting to get better at multiplication in mathematics, the researcher provided a range of different exercises, activities and games that could help the student attain her goal. Also, students were in control of how much they would work on their goal each day, and they registered time spent working on their goal on a self-monitoring schedule. This way, students could choose what kind of exercises they did based on their own preferences, and how much time they would spend working on their goal each day.

For the continuous measure, the researcher assessed the students' performance two to three times per week until all students had at least three data points in both the baseline phase and the intervention phase. A research assistant assessed student performance in approximately 20% of the data points in both baseline and intervention phase together with the researcher, so that interobserver agreement could be assessed. Students were also provided with information on how well they did at each data point by means of visual graphs. After sufficient data points were obtained for all students, the researcher had new conversations with the students and their teachers in order to evaluate the students' goal attainment, to help students identify what steps they had taken to attain their goals, which barriers had been removed, and how students' felt about their work and goal outcome.

After the intervention, data from the multiple baseline study were analyzed visually, based on four criteria for visual inspection, namely change in mean, change in level, change in trend, and latency of the change (Kazdin, 2011, pp.288-291). Change in mean refers to a change in the average rate of performance on the continuous measure. Change in level indicates that there is a leap from the end of the baseline phase to the beginning of the intervention phase. Change in trend refers to the trend line that characterizes the data within each phase, and latency of the change refers to the immediacy of a possible change, i.e. whether the onset of a change appears shortly after the implementation of the intervention (Kazdin, 2011, pp.288-291). Data from the AIR-E-NOR and AIR-S-NOR were analyzed by means of the non-parametric Wilcoxon Signed Rank Test, which is suitable for use with very small samples (Pallant, 2013).

### **4.2.3 Sampling procedure**

Students in the intervention study were recruited through two schools who had already participated in the validation study. School principals and special educators expressed interest



in participating in the research project, and they identified possible participants, who then received information about the study. Parents gave their written consent, while students assented orally. A total of eight students was recruited; two students took part in a small pilot study, and six of them took part in the actual intervention study. The Council for Exceptional Children (2014) states as a quality indicator for single-case studies that the research design should at least provide three demonstrations of experimental effects at three different times. It was therefore important to include a large enough number of participants in the study, as there could occur attrition (e.g. due to illness of participants), and incidences of neutral or negative effect can also be found.

#### **4.2.4 Results**

Multiple baseline data were analyzed visually for changes in mean, level, trend, and latency of the change (see paper IV in this thesis for a visual presentation of the multiple baseline graphs). Analysis of the change in mean suggests that students improved their academic goal attainment during the intervention with the SDLMI, and the immediacy of the change in level suggests that the intervention with the SDLMI is the plausible cause of this change.

To investigate changes in student self-determination, a Wilcoxon Signed Rank Test was used to analyze differences in pre- and post-test ratings on the AIR-E-NOR and AIR-S-NOR. Analysis of the AIR-E-NOR data indicates that students significantly improved their total self-determination score after the intervention, and more specifically, they received significantly more opportunities to practice self-determined behavior. On the AIR-S-NOR there was no significant change in students' self-report of their self-determination. Results from the intervention study are discussed in detail in the fourth paper of this thesis (Garrels & Palmer, 2019).

### **4.3 Accommodations and adaptations to the self-determination measure and intervention**

The AIR Self-Determination Scale student form has been used in several research studies to collect first-hand data about the self-determination of students with ID (see e.g. Shogren et al., 2007; Carter, Trainor, Owens, Sweden & Sun, 2010; Lee et al., 2012). However, these studies fail to report specifically on how data were collected or how much support informants required in order to be able to respond to the items of the questionnaire. Similarly, the SDLMI has been used in multiple research studies with participants with ID (see e.g. Agran, Wehmeyer, Cavin & Palmer, 2010; Shogren et al., 2018:b). Yet again, these studies do not provide information about how the model was implemented in order to meet the specific cognitive needs of students with ID. As research indicates that students with ID have lower levels of self-determination than their typically developing peers (Shogren, Wehmeyer, Palmer & Paek, 2013), and that they gain lower effects from self-determination interventions (Shogren et al., 2012; Wehmeyer et al., 2012), the third research question of this doctoral thesis may become particularly important: *Which accommodations and adaptations may be*

*required in order to adapt self-determination instruments and interventions to meet the specific cognitive profile of students with ID?* To explore the need for accommodations and adaptations during the assessment of self-determination with students with ID, cognitive interviews using the AIR-S-NOR were performed. In order to find suitable accommodations during the intervention with the SDLMI, a qualitative case study design was used.

### **4.3.1 Cognitive interviews**

Cognitive interviewing has been identified as an effective method to identify potential problems with questionnaire items, as it serves the purpose of ‘question inspection’ (Willis, 2005). Cognitive interviews imply some sort of meta-surveying, as the researcher uses different procedures to test how questionnaire items are perceived by possible informants. Thus, during cognitive interviews, the focus lies on the questions and not on the answers. Willis (2005) suggests both think-aloud procedures and verbal probing procedures for this purpose. For think-aloud procedures, the researcher induces informants to think aloud about the questionnaire items, in order to explore how informants understand the different items. Verbal probing procedures imply that the researcher asks the target question and follows up by probing for other relevant information, such as the informants’ comprehension and interpretation of the question, confidence judgments, etc. (Willis, 2005). As younger children and children with ID may have limited think-aloud proficiency, verbal probes were used as the procedure of choice in the validation study.

During the validation study of the AIR-S-NOR, the translated version was first tested on a typically developing 12-year-old, in order to investigate the clarity of the way items were phrased. This led to some minor alterations in wording. Then, the AIR-S-NOR was tested with cognitive interviews on 12 elementary and lower secondary school students. To make sure that the AIR-S-NOR would be fit for use with students with ID, seven of these students had special needs, such as ID, ADHD, and specific language disorder, while the remaining five students were typically developing. Some of the cognitive interviews were performed individually, while others were performed in small groups of two or three students. In some cases, a teacher was also present during the interview.

The cognitive interviews revealed that particularly younger students with ID had significant challenges with responding to some of the items of the questionnaire. Therefore, a number of adaptations and accommodations were made to the AIR-S-NOR, based on a process of iterative testing. For example, after the questionnaire was tried with the first students with ID, visual support was developed, which was then implemented in the next round of cognitive interviews, in order to test the whether this accommodation was helpful and appropriate.

Based on the results from cognitive interviews, several adaptations and accommodations were made to the AIR-S-NOR in order to make it fit for use with adolescents with ID. First of all, the original AIR Self-Determination Scale included a number of items that could be considered double-barreled, such as e.g. ‘I know what I need, what I

like, and what I'm good at'. This item asks about insight in personal strengths, interests and needs, and informants are expected to provide an answer that captures all three aspects. However, impairments in working memory may create challenges for students with ID when trying to hold on to multiple strings of information simultaneously (Schuchardt, Gebhardt & Mächler, 2010). Verbal probing procedures during the cognitive interviews also showed that it was unclear which part of the item informants were responding to. Therefore, these double-barreled items were split up into separate items in the AIR-S-NOR.

Another adaptation to the AIR-S-NOR was the removal of the index 'Opportunities at home'. As informants with ID may struggle with shorter attention spans, Earthman, Richmond, Peterson, Marczak, and Betts (1999) suggest that abbreviated questionnaires may be an acceptable way of accommodating for such challenges. However, such an adaptation does imply a significant deviation from the original questionnaire, and this has implications for how the questionnaire can be used in future research studies. Further accommodations to the AIR-S-NOR include the use of visual support for both the items and the response scale. Cognitive interviews showed that the visual support helped informants to direct their attention to the questionnaire. The visual materials were found useful for maintaining informants' focus and for inhibiting distracting behavior, which are common challenges for individuals with ID who may experience limitations in executive functioning (Danielsen et al., 2012). Finally, a number of accommodations were made regarding the practical administration of the questionnaire, in order to address some of the typical challenges of individuals with ID. These accommodations are described in more detail in the first paper of this thesis (Garrels & Granlund, 2018).

### **4.3.2 Qualitative case study design**

Since there is little research available that explores which accommodations and adaptations may be useful for students with ID in self-determination interventions, a qualitative case study design was considered an appropriate method to investigate this scarcely explored terrain. Qualitative case studies provide a weak basis for causal inferences and generalisations due to the absence of rigorous procedures and the typically small sample size, but they may prove a useful source for the development of interventions and therapy techniques (Kazdin, 2011). In this way, the qualitative case study may provide ideas about how interventions can be adapted to a specific group of participants, as is the case in this doctoral thesis. These ideas are based on the subjective experiences of the researcher, educators and students that participated in the study, but there is no 'hard evidence' to support claims that specific accommodations in the study are responsible for specific desired outcomes.

In order to identify suitable accommodations and adaptations to the SDLMI, the researcher relied on evidence-based knowledge about how students with ID can learn optimally despite their cognitive impairments. This knowledge was translated into several accommodations and adaptations that were tested during the intervention with the SDLMI. The suitability of these accommodations and adaptations was then evaluated by means of behavioral observations of the students during the conversations in the different phases of the

SDLMI. Further, the accommodations and adaptations were explored in light of intervention outcomes and interviews with the participating students after the intervention.

The various accommodations that were implemented during the intervention with the SDLMI include different strategies to support students throughout the three phases of the SDLMI, such as the use of communication techniques, guided goal-setting, and dialogic teaching. These strategies are described and discussed in detail in the third paper of this doctoral thesis (Garrels & Arvidsson, 2018). One specific accommodation that may deserve further elaboration is the use of visual presentations of students' progress while working on their goal. During the intervention with the SDLMI, students' progress was assessed continuously by means of individualized measures. While this was first and foremost for research purposes in order to establish a possible causal relationship between the use of the SDLMI and academic goal attainment, students were given insight in their own multiple baseline graphs while working on their goals. This meant that students could follow visually how they improved from one assessment to the next, and they got to experience how their own efforts led them towards greater goal attainment. As students with ID more often find themselves in restrictive school settings compared to their non-disabled peers (Wendelborg & Tøssebro, 2010), they may also to a lesser degree experience autonomous motivation for learning and they may be more or less detached from their own learning. However, when given the opportunity to choose personally relevant goals, and when experiencing themselves as causal agents in their learning process, students with ID may put in more effort in their school work, and they may experience a greater sense of self-efficacy. Several students highlighted these experiences during the interviews after the intervention. As one student stated, she felt proud and joyful over reaching her goal quickly. Another student said the following about being able to track her personal progress: 'I thought that was quite cool, because then I could see what I didn't do so well last time, and then I could see that I got much better at it compared to when I started' (Garrels, 2018:c). Thus, students may be supported in their development of action-control beliefs when they are given the opportunity to experience the relation between their own efforts and the results of these efforts, and these action-control beliefs form one of the essential characteristics of self-determined behavior (Shogren, Wehmeyer & Palmer, 2017:a). While the case study design does not allow to conclude that showing students a visual graph of their own progress will help them towards greater self-determination and academic goal attainment, students' personal experiences do suggest that it may be a beneficial accommodation during a self-determination intervention.

## **4.4 Ethical research with adolescents with intellectual disability**

### **4.4.1 Anonymity and confidentiality**

This study was approved by the Norwegian Centre for Research Data (NSD). During the recruitment process, special care was taken that no information about possible participants reached the researcher, until these participants had given their consent to participate in the study. To make this possible, the recruitment process was delegated to the students' teachers,

who discussed participation with possible candidates. In this way, the anonymity of each individual was safeguarded until participation was agreed upon, and the researcher did not gain any information about clinical diagnoses before participants were recruited by the teachers. During and after the study, further efforts were undertaken to guarantee the participants' anonymity, by using a coding key in the validation study and fictitious names in the intervention study.

In research studies that use interviews as a means of data collection, it is not uncommon that participants share confidential information with the researcher. However, research suggests that individuals with ID may be apprehensive that researchers break confidentiality, and that this may put them at a risk of backlash from support providers (McDonald, Schwartz, Gibbons & Olick, 2015). In the current study, sometimes students would share personal information or express personal opinions about their school, teachers, or private affairs. As this information is shared in confidence, it is important to respect the boundaries of the interview situation, so that participants feel free to disclose their thoughts and feelings. Thus, information that was shared in confidence was not passed on to teachers or others.

#### **4.4.2 Informed consent**

When investigating complex and subjective matters such as self-determination, proxy reports may have poor agreement with self-reports (Claes et al., 2012; Emerson, Felce & Stancliffe, 2013). Therefore, this study sought to find the personal perspectives of adolescents with ID. However, because of their young age and cognitive impairment, adolescents with ID are considered a vulnerable group in research (NESH, 2016), and obtaining informed consent is considered one of the main challenges in doing research with participants with ID (McDonald, Conroy & Olick, 2017). In order to be able to provide informed consent, the individual needs to possess the cognitive abilities to understand and appreciate the facts, implications, and possible consequences of participating in a certain research study. Difficulties with logical thinking and with seeing consequences of actions may pose challenges in this regard. Also, the tendency to acquiesce that is sometimes seen in individuals with ID may be problematic, and individuals with ID may run the risk of agreeing to actions that they in fact not really wish to participate in. According to Finlay and Lyons (2002), this acquiescence may occur especially when information and questions are presented in a complex manner that does not match the cognitive profile of individuals with ID. Sigstad (2014) also suggests that acquiescence may be a form of compliance based on beliefs about social expectations.

In this study, possible participants received information about the research project in easy Norwegian with additional visual support, so that the content and purpose of the research study was easier to grasp. In addition, this information was explained orally, and the researcher used control questions to make sure that participants understood what they consented to. Even though the students' parents gave their written consent that their child could participate in the study, it was important to ensure assent from the students themselves

as well, as parental consent does not automatically imply that the child is willing to participate. Children may experience a desire to please and/or obey authority figures, such as parents, teachers, or researchers and, for that reason, they may not feel at liberty to decline participation (NESH, 2016). Therefore, it was important to ensure that participants understood that their research participation was voluntary, and the meaning of ‘voluntary participation’ was explained to the participants. Furthermore, the researcher took care to check regularly throughout the research study whether students were still interested in participation. After all, consent that is given in the beginning of the study does not necessarily mean that consent is given once and for all. To make sure that students would be capable of withdrawing from the study if they wanted to, the researcher made an agreement with the students that they could say ‘I don’t want to participate anymore’ in case they felt that way. Providing participants with this ‘escape sentence’ may increase their sense of control in the research situation. During the entire study, it was evident that all participants were very positive about their own research participation, and this was also evidenced by the interviews for social validation at the end of the study.

# 5 Overview of papers

## 5.1 Summary of paper 1

Garrels, V. & Granlund, M. (2018). Measuring self-determination in Norwegian students: Adaptation and validation of the AIR Self-Determination Scale. *European Journal of Special Needs Education*, 33(4), 466-480. DOI: 10.1080/08856257.2017.1342420.

### **Aim of the study**

This paper addresses the first aim of this doctoral thesis, namely to adapt and validate a measure of self-determination. Validated measures of self-determination are widely used in several American research studies, but until now, none of these measures were adapted and validated for use in Norway. With increased political focus on improving self-determination for persons with ID in Norway, the need for a reliable measure for self-determination arises, so that the effects of self-determination interventions can be assessed. Therefore, the purpose of this study is to perform an adaptation of the AIR Self-Determination Scale, and to evaluate the psychometric properties of this adapted instrument. In this study, it was also particularly important to explore which kind of support adolescents with ID require in order to be able to self-report on their level of self-determination.

### **Method**

The validation of any assessment tool requires a rigid and transparent approach, so that other researchers can consider the quality of the process and its outcomes. In this validation study, the framework for cross-cultural validations provided by Herdman, Fox-Rushby and Badia (1998) was followed. In line with this proposed framework, six types of equivalence were investigated, namely conceptual, item, semantic, operational, measurement, and functional equivalence. The translated and adapted version of the AIR Self-Determination Scale, named the AIR-S-NOR was tested on 121 students (49 % male; Mean age = 12.3, SD = 1.57), of whom 34 with ID. 64 students were reassessed with the AIR-S-NOR two weeks later, in order to investigate test-retest reliability. Psychometric reliability of the scale was assessed by calculating Cronbach's  $\alpha$ . Test-retest reliability was assessed by means of Pearson's  $r$  and Spearman's rho. The validity of the AIR-S-NOR was examined by means of principal component analysis (PCA).

### **Main results**

The AIR-S-NOR shows good to very good Cronbach's  $\alpha$  values. Test-retest correlations were good to excellent. PCA analysis supports the bi-dimensionality of the scale. Thus, the AIR-S-NOR shows robust psychometric properties, and the scale provides a reliable instrument for the assessment of self-determination, both for students with and without ID. Students with ID are likely to require considerable support when self-reporting on their self-determination. The adaptations that were made to the scale in order to make it fit for use for students with ID

means that researchers should proceed with caution when using the AIR-S-NOR in comparative studies. An interpretation of the validation data suggests that Norwegian students with ID have significantly lower self-determination scores than their typically developing peers.

## **5.2 Summary of paper 2**

Garrels, V. (2017). Goal setting and planning for Norwegian students with and without intellectual disabilities: Wishing upon a star? *European Journal of Special Needs Education*, 32(4), 493-507. DOI: 10.1080/708856257.2016.1261487.

### **Aim of the study**

In this paper, data from the AIR-S-NOR is extracted to investigate the type and content of goals that Norwegian students with and without ID set for themselves, as this may provide information about the areas in which students experience self-determination. The paper further looks into the questions whether students learn how to set goals and how to make plans for goal attainment at school, as this may offer valuable knowledge about the degree to which students get to practice and refine their self-determination skills at school. Finally, the paper examines whether there occur significant differences between students with and without ID.

### **Method**

The paper analyzes self-reports with the AIR-S-NOR from 83 students with and without ID (65% typically developing; 47% boys; Mean age 12.69 (range 9-16)). A qualitative content analysis for the student goals was performed. Then, student goals were analyzed quantitatively using descriptive statistics. Further, chi-square for independence was calculated to identify possible significant differences between students' developmental characteristics and goal content and category. The non-parametric Mann–Whitney U-test was used to examine differences in the extent to which students with and without ID found that they learned goal setting and planning skills at school.

### **Main results**

Findings suggest that students set both process and product goals for themselves. Most students identified academic goals, followed by career goals and sports-related leisure time goals. No significant differences were found between typically developing students and students with ID. While roughly two-thirds of all students reported that they feel encouraged to set goals for themselves at school, almost 60% of all students reported that they did not learn planning skills at school. This finding suggests the need to assist teachers with instructional materials for how to teach students these important skills for self-determination.



### 5.3 Summary of paper 3

Garrels, V. & Arvidsson, P. (2018). Promoting self-determination for students with intellectual disability: A Vygotskian perspective. *Learning, Culture and Social Interaction*, Online first. DOI: 10.1016/J.LCSI.2018.05.006.

#### **Aim of the study**

Students with ID experience lower effects from self-determination interventions than other students. From a Vygotskian perspective, this may be due to an incongruence between the individual's neurobiological development and the social conditions for development. Therefore, this paper seeks to investigate how a self-determination intervention with the SDLMI can be adapted to the cognitive profiles of students with ID and which scaffolding can be provided in order to optimize intervention outcomes.

#### **Method**

This paper presents a case study in which the experiences from using the SDLMI with eight adolescents with ID are described. Students used the SDLMI to set and attain self-chosen goals for a period of approximately three months. In this paper, the authors apply a Vygotskian perspective in order to understand the challenges that were encountered during the intervention, and suggestions for adaptations are provided.

#### **Main results**

Experiences from the current study allowed for particular adaptations and accommodations in each phase of the SDLMI. During the model's first phase, where students identify a personally relevant goal that they wish to achieve, the use of communication techniques and guided goal-setting were found to be useful strategies to help the participating students with ID. In the model's second phase, i.e. developing an action plan for goal attainment, it was found important to familiarize students with different learning strategies, to use dialogic teaching to help students identify barriers and supports, and to provide the students with self-monitoring strategies. During the final phase of the SDLMI, namely the evaluation phase, a visual presentation of the students' goal attainment was found particularly useful in helping students to develop action control beliefs.

### 5.4 Summary of paper 4

Garrels, V. & Palmer, S.B. (2019). Student-directed learning: A catalyst for self-determination and academic achievement for students with intellectual disability? *Journal of Intellectual Disabilities*. Online first. DOI: 10.1177/1744629519840526.

## **Aim of the study**

This paper explores how student-directed learning may lead to academic achievement and enhanced self-determination for students with ID. Previous research has suggested that student-directed learning may lead to improved academic achievement and self-determination, but how these improvements occur has not been explored. Therefore, this study looks into how students' academic goal attainment and self-determination changes over a three-month intervention with the Self-Determined Learning Model of Instruction, and results are analyzed in light of existing theories on self-determination.

## **Method**

This paper presents a single-case experimental design study with multiple baselines for eight students with mild ID (age 13 – 16). Students' academic goal attainment is measured with individualized continuous measures, while self-determination is assessed prior to and after the intervention by means of AIR-S-NOR and AIR-E-NOR.

## **Main results**

Findings from this study suggest that student-directed learning may lead to enhanced academic goal attainment for students with ID. Teachers reported significant increases in students' self-determination after the intervention, with the biggest change occurring in students' opportunities to practice self-determined behavior. Students themselves did not report significant changes in their self-determination after the intervention, suggesting that the initial change may occur at the environmental level. This finding adds further support for Causal Agency Theory, which stipulates that self-determination is a developmental outcome and a result of continuous practicing and refining of self-determination skills. While a three-month intervention may not be sufficient to alter students' perception of their level of self-determination, even short-term interventions may be useful to change teacher perceptions of their students with ID as causal agents.

# 6 General discussion

Three main research questions have guided the work in this doctoral study:

- 1) *To which extent is the AIR-S-NOR a valid and reliable tool for measuring self-determination in school for Norwegian students with mild ID?*
- 2) *What is the effect of student-directed learning on the academic goal attainment and self-determination skills of students with mild ID?*
- 3) *Which accommodations and adaptations may be required in order to adapt self-determination instruments and interventions to meet the specific cognitive profile of students with ID?*

In this chapter, each of these research questions is analyzed thoroughly in light of the findings from the validation and intervention study, and methodological challenges are considered and discussed. Implications for future practice and research are also presented.

## 6.1 Measuring self-determination in Norwegian students with intellectual disability

In the first research question, the following highlighted key words may deserve attention: ‘How can we **reliably** measure **self-determination** in **Norwegian** students with mild **ID**?’ First comes the question as to how we can measure a complex construct such as self-determination, and then how we can do so reliably. Also, it is important to look into what may be typical of Norwegian students, and more particularly, those with mild ID. These issues are in part discussed in the first (Garrels & Granlund, 2018) and second paper (Garrels, 2017) of this thesis, but are further elaborated on here.

Self-determination is a highly complex construct, which can be understood and defined in different manners, depending on the underlying theory one wishes to adhere to (see chapter 3 and paper IV in this thesis (Garrels & Palmer, 2019) for a brief overview of different theories on self-determination). How one understands self-determination will then have consequences for how one seeks to measure the construct. For example, a large-scale RCT study by Wehmeyer et al. (2013) used two different measures of self-determination to assess outcomes of an intervention with the SDLMI, namely the AIR Self-Determination scale (Wolman et al., 1994) and the ARC Self-Determination Scale (Wehmeyer & Kelchner, 1995). The AIR Self-Determination Scale is based on a self-determined learning theory and it assesses the individual’s capacity and opportunity for self-determination. Within this self-determined learning theory, emphasis lies on the processes by which students become self-determined, and it is postulated that self-determination develops when there is a just-right match between opportunities and capacity (Mithaug, 2003). Self-determination is then seen as a set of skills, such as identifying needs and preferences, setting goals, and planning, on which the development of self-determination depends. The ARC Self-Determination Scale, on the other hand, is based on the Functional Theory of Self-Determination (Wehmeyer, 2006), and it views self-determination as a set of essential characteristics, such as psychological

empowerment and self-realization, that guide the individual's actions. The Functional Theory of Self-Determination overlaps to a certain extent with the self-determined learning theory, as it states that the essential characteristics emerge through the acquisition of multiple component elements, i.e. the same self-determination skills as described in the self-determined learning theory (Shogren et al., 2008). Yet, the AIR Self-Determination Scale and the ARC Self-Determination Scale rely on different theories of self-determination, and they operate on different measurement levels: from the measurement of relatively simple skills that can easily be learned (AIR), to the measurement of complex psychological entities that may be more stable traits within the individual (ARC). In the study by Wehmeyer et al. (2013), the SDLMI was used as an independent variable, and this intervention addresses exactly those component skills of self-determination that are measured by the AIR Self-Determination Scale. It is then not surprising that researchers found significant changes in self-determination on the AIR Self-Determination Scale but not on the ARC Self-Determination Scale.

Thus, when measuring self-determination, researchers need to clarify their understanding of self-determination and use an instrument that is appropriate for this understanding. This is a question of construct validity, which may be somewhat problematic when measuring growth in psychological domains such as self-determination, as, after all, each researcher may have a different understanding of the content and dimensions of a specific construct. Or with the words of psychologist Donald W. Fiske (2001) 'Are you validating my construct or yours?' It is therefore important to be aware of the limitations of the chosen instrument. An assessment with the AIR Self-Determination Scale provides information about a student's capacity and opportunity for self-determination, more specifically about how well they perform some of the component skills of self-determination, and how often they get the opportunity to practice these skills. It does not provide information about broader dispositional characteristics (such as e.g. psychological empowerment or action-control beliefs) within the individual, and results from the scale should not be used to make general claims about such complex psychological characteristics. Findings from the validation study suggest that the AIR-S-NOR is a psychometrically robust measure of self-determination skills, and thus it provides a reliable assessment tool for self-determination. Yet, this reliability is dependent on the instrument being used for what it is intended to measure. According to Herdman et al. (1998), functional equivalence in a cross-cultural validation refers to the degree to which a questionnaire does what it is intended to do in both the source culture and the target culture. Based on this definition and on the findings from the validation study, it can be concluded that the AIR-S-NOR is an appropriate and reliable instrument *for its intended use*, namely the assessment of a person's capacity and opportunity to practice self-determination skills.

Can we then use the AIR-S-NOR to assess self-determination in Norwegian students with ID? Findings from the validation study (Garrels & Granlund, 2018) suggest that students with ID have lower self-reported self-determination scores than their typically developing peers. This indicates that Norwegian students with ID may have more limited experience with performing self-determined behavior, and this may in turn affect how they report on their self-determination skills. When students with ID use the AIR-S-NOR for the first time, they may

not fully grasp the content of all of the items on the questionnaire, and hence, they may give a somewhat inflated score compared to their actual level of performance on self-determined behavior. If they are then exposed to a self-determination intervention where they get to practice these skills that they assessed earlier, this may lead to a subjective recalibration of the way participants understand the measurement scale, or what Millsap and Hartog (1988) refer to as a beta change. This implies that the students' post-test rating may give a more realistic result, but it may also mean that a possible change in student self-determination may go undetected, and researchers could mistakenly conclude that their intervention did not have any effect on student self-determination. Therefore, it could be desirable to supplement students' own ratings of self-determination with a teacher or parent report. While proxy reports may have poor agreement with self-reports on subjective and complex constructs such as self-determination (Claes et al., 2012; Emerson et al., 2013), they may nonetheless provide useful additional information. Norwegian researchers in the disability field should then be encouraged to validate teacher and parent reports of the AIR Self-Determination Scale, and also to adapt and validate other measures of self-determination, so that the full complexity of the concept can be assessed. Such an effort would mean that the self-determination of Norwegian students with ID can be assessed in a more reliable fashion than is the case when only one measure is available.

### **6.1.1 Methodological challenges and limitations of the validation study**

A number of methodological challenges and limitations of the validation study are worth discussing. These include the use of principal component analysis rather than factor analysis for the investigation of the dimensionality of the scale, a lack of investigation of concurrent validity of the AIR-S-NOR, different data collection methods for participants with and without ID, age differences between participants, and subject selection bias may all have affected the results of the study. These issues are discussed underneath.

The first methodological issue concerns the use of principal component analysis rather than factor analysis in order to explore the dimensionality of the AIR-S-NOR. Both techniques are used to understand the structure of an instrument, and both aim to reduce a set of variables into a smaller set of dimensions. However, while factor analysis is used to explain the maximum amount of common variance in a correlation matrix, principal component analysis explains the total amount of variance (Field, 2013). In other words, factor analysis takes into consideration measurement error, whereas principal component analysis uses all of the variance in the data to attain a solution (i.e. both what the variables intended to measure and other sources of variance, such as e.g. measurement error). Hence, results from a factor analysis and principal component analysis may lead to different results, even though these results tend to become more similar with an increasing number of variables. Principal component analysis further assumes that the sample used is the population, and therefore, results cannot be used for hypothesis testing or for generalizations beyond the sample, unless other analyses using different samples reveal the same component structure (Field, 2013). Despite these limitations that principal component analysis imposes, it was the preferred

method of analysis in the validation study of the AIR-S-NOR, because of the relatively small sample size in the study. Norman and Streiner (2014) describe factor analysis as “a large-sample procedure”, and even though recommendations for adequate sample sizes vary and even contradict each other, it is generally accepted that large samples are better (Mundfrom, Shaw & Ke, 2005). In order to investigate the dimensionality of the AIR-S-NOR, a principal component analysis was then found a suitable technique, as it was assumed that, with the given variable-to-factor ratio, this technique could provide results similar to those obtained from a factor analysis, while at the same time taking into consideration the relatively small sample size. However, it is important to acknowledge the limitations that a principal component analysis entails, and not draw inferences beyond those which principal component analysis can support.

In order to validate the AIR-S-NOR, a model of equivalence for cross-cultural adaptations and validations (Herdman et al., 1998) was used, based on the findings from a systematic review of models for the cross-cultural validation of instruments by Epstein et al. (2015). While Epstein and colleagues (2015) found this to be the most comprehensive model for the validation of instruments, the equivalence model does not include an investigation of concurrent validity. Concurrent validity allows researchers to compare results from one measure with results from other measures at the same point in time (Kazdin, 2014), and hence, good concurrent validity strengthens the general validity of a measure. In theory, Herdman et al.’s (1998) equivalence model could be extended by including an assessment of concurrent validity. However, as there is a lack of alternative instruments that measure self-determination and that are validated for use in a Norwegian context, this would have made no difference for the validation of the AIR-S-NOR. This means that results from AIR-S-NOR assessments cannot be compared to results from other assessments that aim to measure similar or opposite concepts, and this implies a weakness or a gap in the research field.

Further, results from the study may have been influenced by different *modi operandi* that were used during data collection. Students without ID answered the questionnaire by themselves under the guidance of the researcher, while students with ID went through the questionnaire by means of interview with the researcher. This may have affected the results of the psychometric reliability testing, as social bias is more likely to occur in interview situations than when filling out a questionnaire. It is then possible that students with ID rated their self-determination higher in order to provide a more socially desirable picture of themselves.

In addition, participants with and without ID were not matched for age in this study. For the 87 typically developing students, the mean age was 11.64 (range 10 – 13, SD .79), whereas for the 34 students with ID, the mean age was 14.18 (range 10 – 17, SD 1.60). Since self-determination is considered a developmental outcome, it can be assumed that self-determination scores increase with age, as students become more proficient in practicing self-determined behavior. Yet, findings from the validation study suggest that students with ID are significantly less self-determined than the typically developing students that participated in the study. Taking these limitations in consideration, it may be correct to assume that the

actual difference in self-determination between typically developing students and their peers with ID is even larger than was found in this study.

One other limitation of the validation study deals with subject-selection bias. Subject-selection bias refers to influences attributable to certain characteristics of the research participants (Kazdin, 2014). In the validation study (and also in the following intervention study), the sampling procedure may have brought bias into the study. First of all, the geographical location of the schools may have provided a sample of students and teachers that may have differed in significant ways from the larger population. In Norway, there may exist a large geographical variation in special educational practices, and practices in the south-eastern part of the country with its many larger cities may be profoundly different from the special educational practices that exist in e.g. smaller coastal or rural villages in the north of the country. Also, schools that agreed to participate may have differed in important ways from schools that declined participation. Possibly, schools that decided to participate may already have had a special focus on student participation and self-determination. Further, critical bias may have occurred in the recruitment process when educators selected possible students for participation. It is likely that educators did not randomly choose students for participation, but that they instead selected students that they considered more apt for participating in a research study, either based on special characteristics of those students (such as being more verbal, more concentrated, or generally more at the upper end of the mild ID range), or based on family characteristics (such as parents' socio-economic status). Thus, students with ID in this research study may have differed in a significant way from the total population of adolescents with ID in Norway, and it is possible that they score higher on self-determination than adolescents with ID who did not participate in the study. This selection bias may have implications for the finding that students with ID have significantly lower levels of self-determination than their typically developing peers, as this difference may be even larger in reality, i.e. the sample may have more positive self-determination outcomes than the population they are thought to represent. This makes the need for suitable self-determination interventions for students with ID even more urgent.

Despite these methodological challenges and limitations, it is believed that the adapted and validated questionnaire provides an important contribution to the field, as the AIR-S-NOR is the first assessment tool for self-determination available in Norway. To be able to assess the full complexity of the self-determination construct, it is desirable that future research seeks to validate other self-determination instruments as well.

### **6.1.2 Critical discussion of findings**

The validation study suggests that the AIR-S-NOR is a psychometrically sound instrument, with good to very good Cronbach's  $\alpha$  values for internal consistency, and good to excellent test-retest reliability. Principal Component Analysis supports the bi-dimensionality of the scale. With the adaptations that are described in the first paper (Garrels & Granlund, 2018), the instrument can be used to assess self-determination skills of students with mild ID. Data collected during the validation study suggest that approximately two-thirds of all students in

feel encouraged to set goals for themselves at school, but 38% of them report that they rarely or never feel that they can engage in goal-setting processes at school, and 57% of all students report that they do not learn goal attainment or planning skills at school (Garrels, 2017). These findings suggest that there is room for improvement for educators both in mainstream and in special education when it comes to putting self-determination on the agenda. After all, a self-determination approach can be considered in line with educational citizenship and horizontal teaching methods that typify the Norwegian educational context.

For the validation of the AIR Self-Determination Scale, the index ‘Opportunities at home’ was removed from both the student and educator form of the questionnaire, as the pilot study suggested that students with ID may benefit from shorter questionnaires due to shorter attention spans and because educators cannot give reliable answers about the students’ home situation. While this may have been a decision that strengthens the reliability of the collected data, it raises a critical question about the extent to which the development of self-determination for students with ID is a school’s responsibility only. Indeed, Wehmeyer (2014) acknowledges that there has not been sufficient research emphasis on the role of families in promoting self-determination for children and adolescents with disabilities, and he calls for longitudinal studies that look into parenting styles and strategies and the effect that these may have on the development of self-determination. Furthermore, Carter et al. (2013) explored how 627 parents of children with ID or autism rated the importance of self-determination skills for their children and how parents assessed their children’s performance on different self-determination skills (choice making, problem solving, self-management, self-regulation, goal setting, self-advocacy, and leadership). Findings from this study suggest that parents overall rated self-determination skills as very important for their children, but despite this positive perception, parents generally reported that their children did not perform these skills well. Since self-determination is considered a developmental outcome, parents may play a crucial role as the child’s first teachers, and therefore, collaboration between professionals and families on the promotion of self-determination skills from the earliest ages should be encouraged (Palmer, 2010). For research purposes, it is then necessary to have access to validated measures that can assess outcomes of family-oriented interventions. Also, data from the first part of this doctoral study suggest a trend that students with ID are more likely to identify academic goals for themselves, as opposed to their typically developing peers who more often identified leisure time goals. While this was not a significant finding, it does raise an important issue concerning the generalization of self-determination skills such as goal setting. Students with ID may have difficulties transferring knowledge and skills from one situation to another, and family involvement may be crucial to compensate for these challenges, as it may allow children with ID to practice self-determination skills in a variety of contexts.

Another finding that deserves discussion deals with the self-report capacity of Norwegian adolescents with ID on abstract skills such as goal setting and planning. The pilot study for the validation clearly showed that students with ID struggled with a number of items on the original AIR Self-Determination Scale after translation only, and several adaptations were required to make self-report possible (see Garrels & Granlund (2018) for an overview of



the adaptations that were made). Yet, when used in other studies, researchers do not comment on any difficulties using the AIR Self-Determination Scale with students with ID, and they do not report on any special support that was provided to the students during the assessment (see e.g. Lee, Wehmeyer, Palmer, Soukup & Little, 2008, and Wehmeyer et al., 2013). While these findings may be symptomatic of the difficulties that students with ID may encounter in contemplating abstract concepts such as self-determination skills, results from the second paper in this thesis (Garrels, 2017) indicated no significant difference in the experiences of students with and without ID when it comes to opportunities and support at school for setting goals and for making plans for goal attainment. This leaves one to question whether Norwegian students in general are less familiar with practicing and reflecting about self-determination skills than e.g. American students, and whether limited exposure may be a plausible cause for some of the findings in this thesis. The meta-analysis by Burke et al. (2018) that looked into interventions to promote self-determination for students with disabilities used a systematic search process to identify peer-reviewed articles published between 2000 and 2015, and found 34 articles on this topic. Of these 34 articles, only two of them described studies performed elsewhere than in the United States (South-Korea and Australia, respectively). This clearly indicates that self-determination research is highly dominated by U.S.-based research groups, despite the concept being first mentioned in relation to individuals with ID by the Swedish philosopher Bengt Nirje in Wolfenberger's (1972) work *Normalization: The principle of normalization in human services*. Since the 1990s, the U.S. Department of Education has consistently supported projects that aimed to develop measures and interventions that could enhance the self-determination of individuals with disabilities (Shogren et al., 2015:a), and this may explain the ongoing dominance of American research in the field. It is then maybe no surprise that American students are more familiar with self-determination terminology than Norwegian students, as self-determination has been defined as best practice in American special education for several decades already. This would add to the rationale for implementing self-determination intervention studies with Norwegian students, as in the second part of this doctoral study.

## **6.2 Enhanced goal attainment and self-determination through student-directed learning?**

The second research question of this doctoral thesis, 'Can student-directed learning enhance the academic goal attainment and self-determination of students with ID?', is discussed extensively in the fourth paper of this thesis (Garrels & Palmer, 2019), which presents results from the intervention study with the SDLMI. Some methodological challenges concerning the intervention study are further elaborated on underneath.

### **6.2.1 Methodological challenges and limitations**

Three methodological issues deserve particular attention in the intervention study, namely i) visual analysis of single-case experimental design studies, ii) matching the research design

with the pace of change of outcomes, and iii) fidelity to method in school-based research and social validation.

### **Visual analysis of single-case experimental design studies**

In order to analyze data from the intervention study, visual analysis of the multiple baseline graphs was used to determine the effect of the SDLMI on students' goal attainment. Visual inspection has long been and continues to play a prominent role in the data analysis of single-case experimental design studies, but there is an increasing interest in the use of statistical analysis for this type of research design (Kazdin, 2011). There are several concerns about the use of visual data inspection. For instance, several studies have indicated that the criteria for visual analysis may be difficult to invoke reliably, as data patterns in the social sciences rarely present an ideal and clear picture, and inconsistencies about the interpretation of intervention impacts may emerge (ibid.). Furthermore, a visual analysis will generally only consider large effects as reliable, whereas weaker effects may not fulfill the criteria for visual inspection, and thus, type II errors are likely to occur (ibid.).

Despite the long-standing tradition for visual analysis in single-case experimental design studies, statistical analysis is gaining ground, as it may be appropriate to address some of the challenges that visual analysis may present. A wide variety of statistical analyses for single-case experimental designs exists, but unfortunately, there is little consensus regarding the superiority of any single method (Smith, 2012). In a systematic review of published research and current standards of single-case experimental designs, Smith (2012) describes multilevel and structural equation modeling, autoregressive moving averages, and standardized mean differences (e.g. Cohen's *d* or Hedge's *g*) as some of the more promising and prevalent analytic methods for this kind of design. Nonlinear Bayesian analysis are further suggested as an appropriate way to analyze single-case experimental design data, as they take into account random effects in small samples (Rindskopf, 2014). While especially multilevel modeling and Bayesian analysis require complex statistical procedures (Fisher & Lerman, 2014), these analytical methods do provide several advantages to the analysis of single-case experimental design studies, such as testing the accuracy of visual inspection, the ability to establish a level of significance, and a more accurate summarization of findings across studies, e.g. in meta-analyses (Shadish, 2014).

In the current thesis, the nature of the intervention study made statistical data analysis difficult. An important aspect of the intervention with the SDLMI is that students identify personally relevant goals, and hence, it is natural that these goals are measured in different ways across cases. For example, one goal can be measured in percentage of correct performance, whereas another goal may be measured in frequency. While this does not entail a serious issue for visual analysis, it is likely to complicate statistical analysis. Therefore, a visual inspection of the continuous data rather than statistical analysis was used to draw inferences about the effect of the intervention with the SDLMI. Since most of the cases in the intervention study showed a relatively clear change in mean, level, and slope between the baseline phase and intervention phase, the likelihood of making a type II error through visual

analysis was small. However, without a statistical analysis, no information about significance or effect size is available, and this can be regarded as a weakness of the study.

### **Research design and pace of change of outcomes**

One of the main aims of the intervention study was to investigate whether the SDLMI can be used as an effective intervention to enhance students' academic goal attainment, which involves at least two central component skills of self-determination, namely goal setting and planning. Simultaneously, the study sought to explore the effect of the SDLMI intervention on the self-determination of students with mild ID. Thus, two different outcomes were targeted: academic goal attainment, which was measured continuously with individualized continuous measures based on the students' self-chosen goals, and self-determination, which was measured with the AIR-E-NOR and AIR-S-NOR prior to and after the intervention. Since students with ID form a low-incidence group and because of practical concerns, the chosen research design was a single-case experimental design study with multiple baselines, rather than a randomized controlled trial (RCT). Yet, like RCT studies, single-case experimental design studies with multiple baselines allow the researcher to draw causal inferences about the effect of a systematically manipulated independent variable, as long as the study is well designed and conducted (Council for Exceptional Children, 2014). To meet the criteria for evidence-based standards in this study, guidelines for single-case experimental design studies from What Works Clearinghouse (Kratochwill et al., 2010) were followed in this study, so that causality can be reasonably inferred.

However, with two different outcomes in the study, an important issue about the pace of change of these outcomes raises itself. On the one hand, the study assessed students' academic goal attainment. As students were supported to identify short-term goals that could be achieved within the course of a couple of weeks, continuous measures of students' progress towards goal attainment were fairly easily assessed for most goals, e.g. by means of percentage of correct performance, duration, etc. Hence, causal inferences about the effect of the SDLMI on students' academic goal attainment are relatively straightforward. On the other hand, the study looked into the effects of the SDLMI on students' self-determination. According to Causal Agency Theory, self-determination is defined as a "dispositional characteristic" (Shogren et al., 2015:a), suggesting that self-determined people show an enduring tendency to act or think in a particular way (Shogren et al., 2017:a). This understanding of self-determination as a dispositional characteristic implies two things: 1) the individual's level of self-determination may not easily be altered (even though Causal Agency Theory takes into account contextual variance), and 2) self-determination cannot be measured continuously. The first implication means that, while it is sensible to use the AIR Self-Determination Scale in short-term studies as it is more sensitive to change because of its focus on capacity and opportunity to perform central skills related to self-determination, a three-month intervention may not be an adequate time frame to draw inferences about the effect of the SDLMI on students' self-determination. Most likely, this kind of short intervention does not provide a sufficient time interval to produce and detect changes in the development of such complex skills. On the other hand, a short-term study does allow the researcher to

explore some of the mechanisms behind the development of self-determination. As the fourth paper in this thesis (Garrels & Palmer, 2019) suggests, after a three-month intervention a significant change in teacher perceptions is detectable on the AIR-E-NOR, and this provides information about the important role that the educational environment plays in the development of self-determination for students with ID.

The second implication raises questions as to whether a multiple baseline design was the best study design to investigate the part of the second research question that deals with self-determination. Multiple baseline designs require continuous measuring of the dependent variable, but a continuous assessment of self-determination is difficult to realize because of its relative stability over short time spans (cf. the good to excellent test-retest correlations of the AIR-S-NOR in the first paper of this thesis). Therefore, a pre- and post-test with the AIR-S-NOR and AIR-E-NOR was added to the multiple baseline study. However, pre- and post-test assessments usually require group comparison studies with a large N and a control group if one wants to draw causal inferences. In the single-case experimental design of this doctoral study, N equaled eight, and this small number of participants makes it difficult to conclude about the effects of the intervention, as the risk of making type II errors is large. In other words, the negative finding on the AIR-S-NOR may be false. Thus, while a multiple baseline design may be used to draw causal inferences about students' academic goal attainment, it may not be the best research design to evaluate the effect of the SDLMI on student self-determination, and an RCT study would have been better fit for this purpose.

### **Fidelity to method in school-based research and social validation**

A meta-analysis of interventions to promote self-determination for students with disabilities suggests that the rigor of the research body is threatened due to low adherence to criteria for implementation fidelity (Burke et al., 2018). This somewhat alarming finding indicates that researchers only to a small extent provide documentation that the intervention is implemented with fidelity when it comes to intervention procedure adherence, dosage, and exposure (Council for Exceptional Children, 2014). This may be due to the fact that more than three quarters of the intervention studies included in the meta-analysis used natural implementation agents, such as teachers and parents, who were trained by researchers or project staff (Burke et al., 2018). Within a natural school setting, it may be more complicated to implement interventions as rigorously as in a laboratory setting, and there may occur some natural variation in the implementation due to factors that are not always easily controlled. In this doctoral study, the intervention was mostly researcher-implemented, even though special educators were present during most conversations with the participating students. With one researcher in charge of implementing the intervention for all participants, it is more likely that the intervention was implemented in a similar fashion across cases. In order to guarantee fidelity to method, checklists for teacher objectives and educational supports were followed during the different phases of the SDLMI (Shogren, Wehmeyer, Burke & Palmer, 2017:c). This suggests that the intervention was implemented as required, but treatment fidelity was not validated by an external fidelity observer. This implies a weakness of the intervention study.

While researcher-implemented interventions to a certain extent may increase fidelity to method, they may also pose questions about the social validity of the intervention. In the intervention study, qualitative interviews were conducted with students and their teachers after the intervention in order to assess their perspectives on the SDLMI and its impact on students' academic goal attainment and self-determination. These interviews were audiotaped and transcribed, and then analyzed thematically to explore students' and teachers' experiences. Findings from these interviews are reported in a Norwegian article (Garrels, 2018:c) that is not included in this thesis. However, it can be summarized that both students and teachers had favorable impressions of the intervention with the SDLMI. Students highlighted amongst others that they appreciated the possibility to set self-chosen goals for themselves, and that it gave them a sense of self-efficacy. Teachers expressed that the intervention had given them new insight in students' self-knowledge, and they were positive about continuing to use the SDLMI. Yet, with an intervention that was mostly researcher-implemented (educators were actively involved in only one of the three rounds with the SDLMI), it is reasonable to question especially the answers provided by the educators, as their exposure to the intervention was more indirect. In sum: while a researcher-implemented intervention may adhere better to criteria for implementation fidelity, this creates a challenge for the social validity assessment of the intervention.

### **6.2.2 Critical discussion of findings**

Findings from the intervention study suggest that the SDLMI may be a useful tool to help students with mild ID attain their self-chosen academic goals. Visual analysis of the multiple baseline graphs suggested that students had overall good goal attainment and it is plausible to assume that this outcome can be attributed to the intervention with the SDLMI. Yet, despite the different strategies that were employed to help students in their goal setting and goal attainment process, the effects of the three-month intervention on student self-determination were minimal (see Garrels & Palmer (2019)). Teachers reported a significant increase in the opportunities that students received at school to perform self-determined behavior, but they did not see significant improvement in students' capacity for self-determination. Students themselves reported a positive trend, but no significant increases were found on their post-intervention scores of the AIR-S-NOR (median scores on the total AIR-S-NOR scale improved from 61 at pre-test to 62.5 at post-test, with a possible maximum score of 84). The fact that students did not report any significant change could be expected based on findings from previous research, which suggest that students with ID experience lower and slower effects of self-determination interventions (e.g. Wehmeyer et al., 2012).

As students with ID generally learn at a slower pace than their non-disabled peers, time becomes an important factor in any type of educational intervention, and this is also the case for self-determination interventions. Regardless of how one chooses to understand self-determination, whether it be a dispositional characteristic or a manifestation of skills, a three-month intervention may simply not be sufficient for students to experience change in their own self-determination. If self-determination is considered a dispositional characteristic, it is logical to assume that a change in how one perceives oneself develops gradually, and a much

longer time span may be required. Students with ID may have accustomed themselves to environments that provide few opportunities to practice self-determination, and any changes in those environments may take time to be perceived, understood, and acknowledged. If self-determination is understood as a manifestation of component skills of self-determination, a change in perception of one's own capacity for self-determination may still take time, even though one has had the opportunity to learn and practice self-determination skills. This may be related to the cognitive impairment that characterizes ID, as students with ID may require longer time before they master complex and abstract self-determination skills. However, not only the short time span of the intervention but also the fact that the intervention was mostly researcher-implemented may have contributed to the fact that students did not report enhanced opportunities to practice self-determined behavior at school, as they may not have considered the intervention as part of their regular school day. This again may stem from difficulties with generalizing from one situation to the next.

The fourth paper of this thesis (Garrels & Palmer, 2019) discusses the finding that teachers rate students' opportunities for self-determination as higher after the intervention, and it is postulated that the development of self-determination may begin with environments that allow students to practice and refine self-determination skills, so that these skills may become an integrated part of how the student acts in different life situations. This is in line with Mithaug's (2003) self-determined learning theory, which emphasizes the importance of exposure to opportunities to practice self-determined behavior in order to become self-determined. Shogren and colleagues (2014) implemented an RCT study with 312 students with ID (30 %) and learning disability (70 %), with the aim to explore the effect of a one-year intervention with the SDLMI on teachers' perceptions of student capacity and opportunity for self-determination as measured by the AIR Self-Determination Scale. Findings suggest significant increases in teacher perceptions on both student capacity and opportunity. This doctoral study, with its shorter intervention span, expands this empirical evidence by proposing that the initial change occurs at the level of the environment (i.e. increased opportunities), before students' capacity for self-determination increases. Thus, findings from the intervention study in this thesis support Mithaug's (2003) theory on the process by which self-determination develops. While other theories on self-determination also emphasize the contextual impact on the development of self-determination, it is assessment with the AIR-S-NOR and AIR-E-NOR, which assess opportunities in the environment to practice self-determined behavior, that allows us to identify this environmental change.

One aspect that deserves more scrutiny is then the need for sustained environmental opportunities to practice such self-determination skills. Social validation interviews performed with participating teachers after the intervention suggest that teachers were surprised by the fact that their students with ID were capable of identifying personally relevant academic goals for themselves, and that they could participate in developing action plans and follow-up on these plans. This information confirms the low expectations that many special educators seem to hold towards their students with ID. It is therefore important to show that students with ID can successfully practice these complex self-determination skills, as long as they are provided with the necessary support. The role of special educators in this

effort can hardly be overstated, as they are in a crucial position where their knowledge and abilities can either promote or hamper the development of self-determination. As Wehmeyer and Shogren (2017) suggest, individuals with ID may have lower levels of self-determination because of the more restrictive living and learning settings in which they frequently find themselves. A lower level of self-determination is then not a direct consequence of impairment, but it may rather be the indirect result of milieus that limit the development of self-determination. This assertion is supported by a research study performed by Wehmeyer and Garner (2003), which assessed the self-determination of 301 adults with intellectual or developmental disability. Findings from this study suggest that intellectual capacity is not a significant contributor to self-determination, but opportunities to make choices contribute significantly and positively to greater self-determination. Simultaneously, this study found evidence that intelligence scores do predict whether individuals work and live in more or less restrictive settings. This interpretation is further supported by a study by Shogren et al. (2018:a) which explored the effect of disability, race-ethnicity, and socioeconomic status on the self-determination of 4,165 students. Data analysis from this study suggests again that differences in self-determination scores based on personal factors such as disability should not be interpreted simply as differences in capacity for self-determination, but rather as differences shaped by limited opportunities and supports. Thus, individuals who are not provided with opportunities to learn how to make choices, set goals, plan, self-evaluate, etc., may simply not learn these skills.

Therefore, it is paramount that special educators become familiar with evidence-based practices that can promote the development of self-determination for students with ID. These evidence-based practices should form an integral part of the higher education curriculum for future special educators. Findings from the intervention study in this doctoral thesis provide further argumentation for a more widespread use of self-determination interventions in Norwegian special education, as they may help educators to provide their students with more opportunities to practice self-determined behavior. It is therefore recommended that the SDLMI be used as an instructional model in order to increase the opportunities for self-determination for students with ID, as this may ultimately enhance their capacity for self-determination. Moreover, as findings from the second paper in this thesis (Garrels, 2017) suggest that there are no significant differences in capacity or opportunity for self-determined behavior between students with ID and their typically developing peers, it can also be argued that educators in mainstream education should infuse their classroom practice with student-directed learning such as with the SDLMI. Doing so may contribute to more horizontal teaching methods and a greater sense of educational citizenship. These are values that are considered in line with Scandinavian educational tradition.

### **6.3 Accommodations and adaptations to the AIR-S-NOR and SDLMI**

The third research question of this doctoral thesis deals with accommodations and adaptations that may be useful in order to adapt the self-determination instrument (AIR-S-NOR) and

intervention (SDLMI) to the specific needs of students with mild ID. In order to find out which adaptations and accommodations were necessary to the AIR-S-NOR, a pilot study with the instrument was conducted. Findings from this pilot showed that Norwegian students with intellectual disabilities had significant problems with responding to several of the items in the questionnaire. These problems may originate from a lack of exposure to self-determination opportunities due to the restrictive and segregated environments in which students with ID frequently find themselves (Wehmeyer & Shogren, 2017; Wendelborg & Tøssebro, 2010), and hence, the content of the items may be unfamiliar to them. Another plausible explanation is that students with ID find it difficult to answer questions that explore complex skills such as setting goals, making plans, and evaluating outcomes, because of the difficulties with abstract thinking that are typical for a diagnosis of ID (Luckasson & Schalock, 2013). Adaptations that were made to the AIR-S-NOR are described in detail in the first paper of this thesis (Garrels & Granlund, 2018), and include amongst others an adaptation of the Likert scale, use of visual support, and the removal of the index 'Opportunities at home'.

Similarly, during the intervention study with the SDLMI several accommodations were implemented in order to overcome some of the challenges that students with ID encounter because of their cognitive impairment. These accommodations are described in the third paper of this thesis (Garrels & Arvidsson, 2018), and include the use of communication strategies and guided goal-setting to help students identify preferences and goals, dialogic teaching, and the use of self-monitoring strategies. While the adaptations and accommodations were found useful and/or necessary during the studies with the AIR-S-NOR and SDLMI, they also introduce certain methodological challenges and limitations, which are discussed underneath.

### **6.3.1 Methodological challenges and limitations concerning adaptations to the AIR-S-NOR**

Due to the challenges that were encountered during the pilot study with the AIR-S-NOR, several adaptations had to be made to the instrument itself and how it was used, such as changes in the response format from a five-point to a four-point Likert scale, the breaking up of double-barreled items, and the provision of visual support during the assessment (see Garrels and Granlund (2018) for a thorough descriptions of the specific alterations that were made to the AIR-S-NOR). These adaptations influence the equivalence between the original AIR Self-Determination Scale and the AIR-S-NOR, and especially item equivalence and operational equivalence may be decreased. However, it is thought that the adaptations lead to a more reliable instrument for use with respondents with ID, which was the main purpose of the first study. Still, such changes imply that the translated and adapted version of the questionnaire differs to a certain extent from the original instrument, making cross-cultural comparisons difficult. Therefore, researchers need to proceed with caution when wanting to compare the level of self-determination in Norwegian students to that of students in other countries.



Furthermore, the adaptations and accommodations that were made to the instrument were based on experiences from a pilot study, which included a small sample of participants only. While it was clear that a mere translation of the AIR Self-Determination Scale would not suffice for use with students with ID, the final adaptations to the instrument were based on clinical and pedagogical experience of the researcher, rather than on a systematic approach in which different adaptations were tried and compared. Thus, it cannot be concluded that these adaptations and accommodations were more suitable than other possible adaptations. However, their implementation had the desired effect, as they allowed students to self-report on their own level of self-determination with good psychometric reliability.

### **6.3.2 Methodological challenges and limitations concerning adaptations to the SDLMI**

The first criterion for evidence-based standards in single-case experimental design studies refers to a systematic manipulation of the independent variable, i.e. the intervention must be applied with fidelity to method for each of the cases (Kratochwill et al., 2010). In case of the intervention with the SDLMI, this criterion raises two closely related questions, namely i) which causal inferences can be drawn if the independent variable consists of multiple components, and ii) do individualized adaptations and accommodations interfere with the demand for a constant independent variable?

In single-case experimental design studies, a systematic manipulation of the independent variable is relatively straightforward when the independent variable is of a single nature. However, the SDLMI is an instructional model that consists of multiple components, and this calls for caution when drawing causal inferences. Indeed, the SDLMI is an instructional model that helps students practice and refine several self-determination skills through the three different phases of the model. This description of the SDLMI implies that the model addresses multiple component elements of self-determination rather than one single skill. As described earlier, self-determination is composed of several component elements such as identifying strengths and needs, choice-making, setting goals, making plans for goal attainment, etc. (Palmer, Wehmeyer & Shogren, 2017). This way of understanding self-determination suggests that it is unlikely that a simple intervention could address all of these different aspects at the same time. For example, a choice-making intervention may be useful for enhancing exactly this one skill of choice-making, but it would be misleading to call it a self-determination intervention, as self-determination is a much broader construct which encompasses far more skills than merely choice-making. Research has also indicated that interventions that address multiple components of self-determination show better efficacy in enhancing self-determination than interventions that address single components only (Cobb et al., 2009). Yet, when interventions use different strategies to address multiple components simultaneously, this may have consequences for how results from such interventions can be interpreted and what kind of inferences can be drawn.

Here, it is important to emphasize that the SDLMI merely provides a framework for instructional practice. It is then this framework, which is made up of the model's three

phases, that forms the independent variable. How students move through these phases may vary e.g. with the type of goal that was chosen, or with the specter of educational supports that the educator has at hand. An important characteristic of the SDLMI is that it makes active use of a wide variety of techniques in the different phases, such as discussion between teacher and student, educational and motivational supports, encouragement, didactic strategies, and teacher objectives (Shogren et al., 2017:c). All of these techniques may contribute to teach students how to self-direct their learning and, ultimately, to improve their goal attainment and self-determination skills, but the exact contribution of each technique cannot be assessed in the type of single-case experimental design that was used in the intervention study of this doctoral thesis. Thus, it is the SDLMI as an ‘intervention package’ that forms the independent variable. This multiple component nature of the independent variable may also affect future replications of the study, since the SDLMI as a framework may function more or less effectively depending on the educational supports and techniques that are used during the different phases of the model. A systematic exploration of the use of these different educational strategies within the SDLMI could provide useful information about which techniques are most likely to enhance student self-determination and goal attainment.

Closely related to the issue of systematic manipulation of the independent variable is the question of how researchers can implement individualized adaptations and accommodations to a certain intervention tool, while still guaranteeing that the independent variable is manipulated systematically. Here again, it is a question of ‘Fidelity to which method?’, as additional implementation of individualized adaptations and accommodations may muddle the lines of causality even more.

During the intervention study, adaptations and accommodations were implemented based on a qualitative case study approach (see 4.3.2). Different strategies were tried out in order to help students develop goals and action plans for themselves, such as explorative communication techniques, guided goal-setting, dialogic teaching, and self-monitoring strategies. These adaptations and accommodations are thoroughly described in paper III (Garrels & Arvidsson, 2018). Again, given the single-case experimental design of the intervention study, it is difficult to make claims about the efficacy of the different accommodations that were provided to the students when using the SDLMI. While it was clear during the intervention that the supports were useful and valuable for the quality of the interaction between researcher and participating students, this information is first and foremost anecdotal. There is no specific information available as to which of the accommodations had any proven effect, and the design of the intervention study does not allow systematic comparison of the different accommodations that were used. Yet, this doctoral study is thought to provide an important contribution to the field as it identifies possible approaches in order to remediate some of the difficulties that students with ID experience with the acquisition of self-determination skills. Further research is required to assess systematically the effect of the different strategies that were used during the intervention.

## 6.4 Implications for future research and practice

The first study of this doctoral thesis validated the AIR-S-NOR, the Norwegian equivalent of the student report of the AIR Self-Determination Scale (Wolman et al., 1994). In order to allow for a more thorough assessment of students' self-determination, a validation of the teacher and parent form of the Air Self-Determination Scale would be welcomed. Since students with intellectual disabilities regularly encounter difficulties with the generalization of skills from one setting to another, including parents and families in the promotion of self-determination becomes especially important. In order to be able to assess the impact of family-oriented interventions, validated measures to this purpose are a prerequisite. Also, since self-determination is a complex construct, the validation of other self-determination measures, such as the ARC Self-Determination Scale (Wehmeyer & Kelchner, 1995) or the Self-Determination Inventory (Shogren et al., 2017:a) would provide an important contribution to the Norwegian special educational field. A broad dissemination of such validated measures to special educators could help to ensure that self-determination becomes a pivotal area of interest for students with ID, thus aiding them in the pursuit of important post-school outcomes.

The second study of this doctoral thesis explored the effects of the SDLMI on academic goal attainment and self-determination. Academic goal attainment and self-determination are considered important outcomes for students with ID, and there is a growing research base that demonstrates the benefits of student-directed learning, such as e.g. with the SDLMI, to promote these outcomes. Yet, reports on the quality of Norwegian special education consistently show that students in special education do not experience sufficient room for participation in the planning and implementation of their educational goals (Ombudsman for Children, 2017), and this may have consequences in other areas than academic goal attainment and self-determination. Therefore, it could be interesting to explore the effects of the SDLMI on other desirable outcomes, such as student motivation, self-efficacy, classroom participation, and quality of school life, as this could lead to an even clearer understanding of the importance of seeing students as agentic agents in their own education.

During the intervention with the SDLMI, students' academic goal attainment was assessed continuously, and their capacity and opportunity to set goals for themselves and to make plans for goal attainment was assessed prior to and after the intervention. However, neither of these assessments looked specifically into how students improved their independent goal-setting skills and how much support they required in the different phases of the goal-setting and planning process. A dynamic assessment of the type of support that students require in order to set specific, short-term, attainable, and measurable goals for themselves could provide useful information about how students develop their goal-setting skills. This could be of interest to explore further in future research studies, as it could provide new information about useful accommodations in the goal-setting process for students with ID.

While this doctoral thesis sought to investigate the effects of the SDLMI, this does not imply that this instructional model is the best or only tool to accomplish student-directed learning. Other instructional models exist, and large-scale RCT studies can provide information as to which models may have the largest impact on preferred outcomes. This thesis focused solely on students with mild ID, but self-determination may be equally important for those students with more severe degrees of ID. However, since the SDLMI is a conversation-based instructional model, it may be difficult to implement with students who have more significant cognitive impairments. Therefore, researchers should also look into instructional models and strategies that may benefit the development of self-determination for this group.

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# Attachment 1

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## Measuring self-determination in Norwegian students: adaptation and validation of the AIR Self-Determination Scale

Veerle Garrels & Mats Granlund

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# Measuring self-determination in Norwegian students: adaptation and validation of the AIR Self-Determination Scale

Veerle Garrels<sup>a</sup> and Mats Granlund<sup>a,b</sup>

<sup>a</sup>Department of Special Needs Education, Faculty of Educational Sciences, University of Oslo, Oslo, Norway;

<sup>b</sup>CHILD, Institute of Disability Research, School of Health Science, Jönköping University, Jönköping, Sweden

## ABSTRACT

This study describes the adaptation and validation of the American Institute for Research (AIR) Self-Determination Scale for use in Norwegian research and education. The study contributes to the field by enabling reliable assessment of self-determination of Norwegian students with intellectual disability. The operational equivalence of the construct of self-determination in American and Norwegian culture were examined. The article further describes the adaptations that were made to the scale to ensure its fitness for intended use. Psychometric reliability (Cronbach's  $\alpha$  and test-retest reliability) was tested on 121 students, and the underlying structure of the scale was examined by means of principal component analysis. The adapted version of the questionnaire (AIR-S-NOR) shows respectable psychometric properties. Suggestions for how the AIR-S-NOR can be used in future research and educational practices are presented.

## ARTICLE HISTORY

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## KEYWORDS

Adaptation; validation; AIR Self-Determination Scale; equivalence; intellectual disability

## Introduction

Self-determination is a psychological construct that refers to self- (versus other-) caused action, suggesting that self-determined people are people that act volitionally, based on their own free will (Wehmeyer, Shogren, Little, and Lopez 2017). Self-determination is considered an important educational outcome for all students, and the construct may especially hold promise as a means to conceptualise functioning in persons with intellectual disability. Internationally, promoting self-determination for students with intellectual disability is considered best educational practice, with levels of self-determination being positively correlated with desirable post-school outcomes, such as independent living, employment, financial independence, and larger potential for social integration and community access (Nota et al. 2007; Shogren, Wehmeyer, Palmer, Rifenbark et al. 2015; Wehmeyer and Palmer 2003). Self-determination is considered a significant quality of life predictor, especially with respect to personal development and personal fulfilment (Lachapelle et al. 2005; McDougall, Evans, and Baldwin 2010). Lack of opportunities for self-determination has been associated with a higher prevalence of mental disorders and maladaptive behaviour in persons with intellectual disability (Clark et al. 2004).

**CONTACT** Veerle Garrels  [veerle.garrels@isp.uio.no](mailto:veerle.garrels@isp.uio.no)

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Whilst self-determination has received considerable international attention in educational research and practice during the last two decades, most of the assessment tools for this construct are developed in the US. With increasing interest for finding interventions to improve the self-determination of Norwegian students with intellectual disability, the availability of a validated self-determination instrument is a prerequisite when the effect of such interventions is to be evaluated. The aim of this study was therefore to perform an adaptation and validation of the American Institute for Research (AIR) Self-Determination Scale (Wolman et al. 1994).

### **Purpose of the study**

Validated measures of self-determination are widely used in international research, but so far none of these have been adapted and validated for use in Norway. With increasing focus on improving self-determination for persons with intellectual disability in Norway, the need for a reliable measure for self-determination arises. Because of linguistic and cultural differences, merely translating an assessment tool may not be sufficient. Instead, an adaptation process that follows carefully described steps is necessary. The purpose of this study is to perform an adaptation of the AIR Self-Determination Scale, and to evaluate the psychometric properties of this adapted instrument. The validation study is part of a larger study that aims to evaluate the effects of a self-determination intervention for Norwegian students with intellectual disability.

### **The AIR Self-Determination Scale**

The AIR Self-Determination Scale measures students' levels of self-determination by means of a student self-report, an educator form and a parent form. In this article, the adaptation and validation of the student form (AIR-S) is presented. This focus on self-report is in line with the agentic perspective of the concept of self-determination.

The AIR Self-Determination Scale is based on Mithaug's (1993) self-regulation theory that explains how people regulate their thoughts, feelings, and actions in order to attain goals that define themselves as self-determining persons. Wolman et al. (1994) describe self-determined people as people 'who know and can express their own needs, interests, and abilities'. Choice-making, goal-setting, planning, and self-regulation are important elements in Wolman et al.'s (1994) understanding of self-determination, and they emphasise the interaction between capacities and opportunities for the development of basic self-determination skills. Challenges that form a just-right match between capacity (i.e. a person's knowledge, abilities and perceptions) and opportunities provided by the environment will be pursued, and this will lead to the development of self-determination (ibid.).

The AIR-S consists of 24 statements rated on a five-point Likert scale (ranging from *never* to *always*), with subscales for capacity and opportunity. The capacity subscale consists of two indexes, namely 'Things I do', which asks about self-determined behaviour, and 'How I feel', which asks about students' feelings when performing these self-determined behaviours. The opportunity subscale also consists of two indexes, i.e. students' perceptions of opportunities for self-determined behaviour at school and at home. Each index consists of six items that relate to basic self-determination skills: identifying strengths and weaknesses, setting goals and planning for goal attainment, self-management and self-regulating.

For the AIR-S, the capacity and opportunity subscales can be combined to calculate a higher-order self-determination score, and research has shown a strong correlation between the two subscales<sup>1</sup> on this form:  $r = .73$  (Shogren et al. 2008). The questionnaire also includes three open-ended questions, about a goal the student is currently working on, his or her plan to achieve that goal, and the progress towards goal achievement. Students with special needs may require certain adaptations to the scale and its administration to be able to provide a self-report (Wolman et al. 1994).

Wolman et al. (1994) tested the reliability and validity of the scale, and found a Cronbach's  $\alpha$  of .92 and adequate validity. Shogren et al. (2008) and Chou et al. (2015) confirmed the use of the AIR Self-Determination Scale as a viable tool for assessing self-determination in students with disabilities. However, it should be noted that the AIR-S is not a normative scale. It is not standardised by age levels, and therefore, it cannot be used for diagnostic purposes, nor does it have a predictive validity.

### **Guidelines for cross-cultural adaptation of questionnaires**

The aim of cross-cultural adaptation of a questionnaire is to achieve equivalence between the original instrument and the adapted version (Epstein, Santo, and Guillemin 2015). In a review of guidelines for cross-cultural adaptations, Epstein, Santo, and Guillemin (2015) identified 31 different guidelines for this adaptation process, but no evidence of a gold standard emerged. Although no specific method can be recommended, the process should at least involve an adequate methodological strategy for adaptation of the instrument, criteria for analysing the quality and equivalence of the translation, and techniques for evaluating the psychometric properties of the adapted instrument (*ibid.*). Following the review by Epstein, Santo, and Guillemin (2015), Herdman, Fox-Rushby, and Badia (1998) provide the most comprehensive framework for investigating cross-cultural equivalence. This framework describes six types of equivalence that need to be considered in the adaptation process: conceptual, item, semantic, operational, measurement and functional equivalence. In this study, this model of equivalence was used as the methodological framework in the adaptation and validation of the AIR-S.

### **Conceptual equivalence of self-determination**

Conceptual equivalence deals with how a certain complex construct is conceptualised in the source and target culture, and it should be investigated before any adaptation of the questionnaire is initiated to ensure relevance of the instrument for the target population (Herdman, Fox-Rushby, and Badia 1998).

Self-determination has by some researchers been described as an Anglo-American middle- and upper middle-class concept, and a typical value of US mainstream culture that emphasises independence (Turnbull and Turnbull 1998). This perspective implies that the concept of self-determination is culture-bound, and that it can only be interpreted within the Anglo-American culture that promotes independence and individuality. Other researchers found evidence of a culture-sensitive approach, which assumes that self-determination occurs across cultures, but that cross-cultural variation may exist (Leake and Boone 2007; Ohtake and Wehmeyer 2004). This culture-sensitive approach postulates the need to establish the degree to which the concept of self-determination is interpreted in the same way

across different cultures. In this study, conceptual equivalence was examined by exploring influential disability research and literature concerning the construct of self-determination in the source culture (US) and the target culture (Norway). During the process of examining conceptual equivalence, attention was paid to the extent to which the subscales and the items that make up the AIR-S, are present in the disability research and literature on self-determination in both cultures.

In the US, the field of self-determination for persons with disabilities has largely been dominated by the work of Wehmeyer and colleagues, first with the Functional Model of Self-Determination (Wehmeyer, Kelchner, and Richards 1996), which then, after several iterations, resulted in Causal Agency Theory (Shogren, Wehmeyer, Palmer, Forber-Pratt et al. 2015). These iterations indicate that conceptualising self-determination is not a static process, but that the conceptualisation is impacted by changes in time, changes in context, and changes in our understanding of human behaviour and disability (Shogren, Wehmeyer, Palmer, Forber-Pratt et al. 2015). The current understanding of self-determination has to a large extent been influenced by the discipline of positive psychology, where self-determination is a central construct, and by a strengths-based understanding of disability, which focuses on the improvement of the person–environment fit (*ibid.*). Causal Agency Theory intends to explain *how* people become self-determined, i.e. by learning, practicing and refining skills that are considered component elements of self-determination, such as ‘learning to make choices and express preferences, solve problems, engage in making decisions, set and attain goals, self-manage and self-regulate action, self-advocate, and acquire self-awareness and self-knowledge’ (Shogren, Wehmeyer, Palmer, Forber-Pratt et al. 2015, 259, 260). Acquisition of these component skills is thought to build the foundations for self-determination, as it enables the expression of the essential characteristics of self-determination, namely volitional action, agentic action and action-control beliefs (Palmer, Wehmeyer, and Shogren 2017). Despite the different theoretical perspective on self-determination, the component elements of self-determination as described in Causal Agency Theory overlap to a large extent with the specific item content of the AIR Self-Determination Scale. As Shogren et al. (2008) suggest, the AIR Self-Determination Scale may be measuring the precursors to the development of the essential characteristics of self-determined behaviour that are described in Causal Agency Theory.

Reeve (2002) states that self-determination is about freely initiated action that arises from within one’s self, and he identifies three essential qualities in the experience of self-determination: internal perceived locus of causality, volition and perceived choice. The essential qualities of internal locus of control and volition seem to tap into causal agency and volitional action, as in the definition of self-determination by Shogren, Wehmeyer, Palmer, Forber-Pratt et al. (2015).

Field and Hoffman (1994:164) defined self-determination as ‘the ability to identify and achieve goals based on a foundation of knowing and valuing oneself’. This definition identifies five components that are thought to lead to self-determination, namely know yourself, value yourself, plan, act and experience outcomes, and learn. As with the previously mentioned definitions of self-determination, goal setting, planning and evaluating are key elements in the definition of Field and Hoffman.

While several more definitions of self-determination have emerged over time in the US, and these definitions vary in perspective and purpose, Field et al. (1998) found that the definitions are essentially consistent and complementary.



In Norway, research and literature on self-determination is less comprehensive, but several leading authors within the disability field have tried to conceptualise the construct, often relying on American definitions. Ellingsen (2007) asks whether self-determination is all about deciding for oneself as the Norwegian word for self-determination may suggest ('selvbestemmelse'), and he discusses challenges in personal decision-making for persons with intellectual disability. Further, Ellingsen's understanding of self-determination encompasses making choices based on personal preferences and a plan for what one wants to achieve. Ellingsen emphasises that becoming self-determined is a process.

Lorentzen (2007) mentions the importance of acting with intent in his discussion of self-determination, and he distinguishes between self-determination, other-determination, and a natural and healthy dependence on others. For Lorentzen, social context is important for the development of self-determination, and he emphasises the need for meaningful and supportive relations with trusted others as a prerequisite for self-determination. Thus, the opportunities for self-determination provided by the environment are essential in this understanding. Lorentzen also discusses self-determination as self-realisation, where a person is considered to have a certain potential that can be developed or not, and here, making choices based on personal preferences plays an important role.

Sagen and Ytterhus (2014) based their self-determination research on a civil rights perspective, and focused on active agency, goal orientation, participation, decision-making, choice-making, self-regulated learning and self-advocacy in their understanding of self-determination. In their research, Sagen and Ytterhus looked especially into how the school environment promotes self-determination in students with intellectual disability, and by taking this perspective, they highlight the importance of opportunities provided by the environment over individual capacity.

Although none of the Norwegian authors provide their own clear-cut definition of self-determination, many of the aspects that are present in their discussions of the construct are also found in the American definitions of self-determination, and there is substantial overlap with the items on the AIR-S. Component elements of self-determination, such as goal-setting, planning, expressing personal preferences, choice-making, decision-making and self-advocacy, are found in the self-determination definitions of both cultures. However, the Norwegian understanding of self-determination seems to underscore the importance of a supportive environment that provides opportunities for self-determination more so than the American perspective, which may be more dominated by a focus on individual capacity for self-determination. This Norwegian emphasis on environmental opportunities is in line with the relative understanding of disability that is common in the Scandinavian countries.

This brief investigation of the conceptual equivalence of self-determination in American and Norwegian culture suggests that there are many similarities in how the concept is understood, and the component elements of self-determination that are assessed with the AIR-S are considered relevant for the understanding of the construct in both cultures. The AIR-S enables assessment of both individual capacity and opportunity, thus uniting the different perspectives on self-determination that may exist across both cultures.

### **Item equivalence**

Item equivalence refers to whether items representing a certain concept are comparable and adequate across cultures, as the relevance of some items may vary across cultures.

Sagen and Ytterhus (2014) found in their study that self-determination for Norwegian students with intellectual disability was mostly limited to making choices. Garrels (2016) found that 40% of the Norwegian students did not feel encouraged to set goals for themselves at school, and 60% of the students had not learned how to make plans for goal attainment. These findings suggest that Norwegian students may have limited experience with the items in the AIR-S, and the relevance of goal-setting, planning and problem-solving may not be self-evident for them. However, since increased self-determination is a political and educational goal in Norway (cf. Educational Act 1998; White Paper Number 17 2016), but no instructional materials or assessment tools are currently available, all items from the original AIR-S were retained in the adapted version. To make the items more accessible for the students and to improve item equivalence in the adapted version of the AIR-S, examples were provided for each item.

### **Semantic equivalence: translation procedure**

Semantic equivalence deals with the correctness of the translation of the measurement tool. In this validation study, standard procedures for translation were followed. The AIR-S was translated into Norwegian by a philologist with knowledge of both the respective languages and the research field, followed by a back translation by a native English speaker who had no a priori knowledge of the intent and concepts underlying the instrument. This unawareness of intentions contributes to eliminating bias and expectations in the translation (Guillemin, Bombardier, and Beaton 1993). Small adjustments were then made to the first translation to maximise semantic equivalence.

### **Operational equivalence**

Operational equivalence deals with ensuring that the measurement methods in each culture correspond with each other. Even though Likert scales are commonly used in Norway, the five-point Likert scale of the original questionnaire was changed into a four-point scale, keeping the response alternatives 'always', 'often', 'rarely' and 'never'. This adaptation was based on an analysis of research literature on the use of Likert scaling with children, suggesting that young children and possibly children with intellectual disability tend to answer at the extreme ends of Likert scales, especially when presented with more subjective statements, as in the AIR-S (Chambers and Johnston 2002). With a four-point scale, a two-step response procedure could be used, where students are first helped to identify whether their answer tends towards 'always' or 'never', followed by a second question to determine whether it is e.g. 'never never' or 'almost never'. This way of providing only two response options at a time may lead to more accurate ratings (ibid.). However, these changes to the response format of the questionnaire do have implications for cross-cultural research, as is discussed later in this article.

### **Pilot study and resulting adaptations**

After the investigation of item, semantic and operational equivalence, cognitive interviews with 12 elementary and lower secondary school students (five typically developing, seven

with special needs) were performed. This pilot study led to six additional adaptations of the instrument:

- (1) The AIR-S contained three double-barrelled items. For example, the first item of the 'Things I do'-index asks about both strengths and needs ('I know what I need, what I like, and what I'm good at'), while the second item asks about goal-setting and thinking of strengths when setting goals ('I set goals to get what I want or need. I think about what I am good at when I do this'). As it could happen that students know their strengths but not their needs, or that they set goals without considering their strengths, these items were split into two separate items. This resulted in three extra items (Cap2, Cap4 and Cap10). These changes led to a total of eight questions for the index 'What I do', seven questions for the index 'How I feel', and an unaltered six questions for the index 'What happens at school'. A presentation of the original items and the adapted version of the scale is available via [hyperlink](#).
- (2) To ease administration, the index 'Opportunities at home' was removed, so that the questionnaire would take no longer than 30 min to answer. Earthman et al. (1999) suggest the use of abbreviated surveys for target groups that may have difficulties answering questionnaires, such as persons with intellectual disability.
- (3) As students with intellectual disability seemed to have difficulties understanding some of the more abstract questions, visual support was provided for the items and the response scale. The visual support for the response alternatives consisted of pie charts and word pictures that students could point at when giving their response. The visual support for the questions consisted of pictures of the main concepts in each question, e.g. a picture of a plan or of a teacher listening. Visual support is considered a useful support for students to focus their attention (Nilsson et al. 2015).
- (4) Following recommendations from Earthman et al. (1999), five practice statements were developed for training before starting on the actual questionnaire. These practice statements function as an introduction for children on how to use Likert scales, and include simple statements such as 'I eat chocolate for breakfast' and 'I sleep well at night'.
- (5) When going through the student form with children with intellectual disability, the questionnaire items were rephrased into an interrogative format, as this made for easier understanding with the participants.
- (6) The distinction between the indexes 'What I do' and 'How I feel' was difficult to grasp for some of the students with intellectual disability. This issue was solved by alternating the order in which the questions were asked, where each question from the index 'What I do' was immediately followed by the corresponding question from the 'How I feel' index, thus clarifying the difference to the students. For example, when students were asked whether they make plans to achieve their goals ('What I do'-index), this question was immediately followed by the question whether they enjoy making plans to achieve their goals ('How I feel'-index).

These alterations to the AIR-S student form led to a modified version with 21 questions, hereafter named AIR-S-NOR, where scores can range from 21 to 84. A user-guide in Norwegian for how to administer the questionnaire can be obtained from the first author.

## Measurement equivalence: psychometric reliability and validity of the AIR-S-NOR

### Participants

The AIR-S-NOR was tested on 87 typically developing students and 34 students with intellectual disability (49% male; Mean age = 12.3, SD = 1.57). To obtain this sample, 22 schools in Eastern Norway were chosen randomly and invited to participate. Nine schools agreed to participate, and written parental consent was gained for all participants. Typically developing students filled out the AIR-S-NOR in their classrooms under guidance of the first researcher. Students with intellectual disability needed more scaffolding to be able to answer the questionnaire, and therefore, individual interviews were used. Sixty-four students (42 typically developing) filled out the instrument again after approximately two weeks to evaluate test-retest reliability.

### Method

All data were analysed using SPSS version 24. Missing data were at 1.7%. Missing values were substituted with the mean value of the respective index for the participants in question.

Before the psychometric reliability of the AIR-S-NOR was assessed, histograms were used to check for normal distribution for the total sample, the sample of typically developing students and the sample of students with intellectual disability. This revealed that the distribution of the total self-determination score was not the same across categories of developmental characteristics. Whilst the total sample and the typically developing students had a normal distribution of self-determination levels, students with intellectual disability did not. This had implications for further data analysis, and differences between the two samples were examined.

Psychometric reliability of the AIR-S-NOR was assessed by calculating Cronbach's alpha for the total scale, the capacity subscale and the opportunity subscale. Separate alphas were calculated for the sample of typically developing students, students with intellectual disability, and the total sample. For test-retest reliability, Pearson's  $r$  was calculated for the normally distributed total sample ( $n = 64$ ) and for the typically developing students ( $n = 42$ ), and Spearman's rho for the students with intellectual disability ( $n = 22$ ). Correlations between the capacity and opportunity subscale were also examined. The validity of the questionnaire was examined by means of principal component analysis (PCA). Because of the small sample size, PCA was performed for the total sample only.

### Results

Total self-determination scores ranged from 38 to 84 for the total sample ( $M = 63.5$ ,  $SD = 9.60$ ). The mean score for typically developing students was 64.6 ( $SD = 9.42$ ), and for students with intellectual disability it was 60.8 ( $SD = 9.67$ ). A Mann-Whitney  $U$  Test revealed a small but significant difference in the total level of self-determination of typically developing students ( $Md = 64$ ,  $n = 87$ ) and students with intellectual disability ( $Md = 59.5$ ,  $n = 34$ ),  $U = 1112$ ,  $z = -2.118$ ,  $p = .034$ ,  $r = .19$ . This indicates that students with intellectual disability show lower levels of self-determination than their typically developing peers.

For reliability measures, Cronbach's alpha for the AIR-S-NOR as a whole and for the capacity and opportunity subscales were calculated. Reliability was investigated for the whole sample, and for the samples of typically developing students and students with intellectual disability separately. The results show good to very good reliability, with values ranging between .75 and .89. (see Table 1). These values are slightly lower than what Wolman et al. (1994) found for the total scale,  $\alpha = .92$ .

Test-retest correlations were calculated for the total scale of the AIR-S-NOR and for the subscales, using Pearson's  $r$  for the normally distributed total sample and sample of typically developing students, and Spearman's rho for the students with intellectual disability. Test-retest correlation ranged from .79 to .86. These good to excellent values indicate adequate test-retest reliability (Table 1).

The relationship between the capacity subscale and the opportunity subscale was also assessed. Shogren et al. (2008) found in their study a strong correlation between these subscales of the AIR-S ( $r = .73$ ). In the present study, more moderate correlations between the subscales were found for the total sample ( $r = .44$ ), for the sample of typically developing students ( $r = .46$ ), and for the sample of students with intellectual disability ( $r = .40$ ).

Before initiating PCA, the suitability of the data for factor analysis was examined. Inspection of the correlation matrix showed the presence of many coefficients of .3 and above. Bartlett's Test of Sphericity was highly significant ( $p = .000$ ), and the Kaiser-Meyer-Olkin value was .824, supporting the factorability of the matrix. These findings indicated that the data from the AIR-S-NOR could be subjected to PCA.

PCA revealed the presence of six components with eigenvalues exceeding 1, explaining 29.80, 11.04, 6.18, 5.91, 4.97 and 4.78% of the variance, respectively. Inspection of the screeplot showed a clear break after the second component, suggesting the extraction of two components for further investigation. Parallel Analysis, calculated with the Monte Carlo PCA program, gave only two components with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size (21 items x 121 participants). The component matrix also indicated that most of the items loaded on the first and second component, with few items loading on components 3, 4, 5 and 6. These findings from the Parallel Analysis and the component matrix supported the decision from the screeplot to retain a two-component solution for further investigation, and therefore, a two-component solution was forced in SPSS.

**Table 1.** Cronbach's  $\alpha$  and test-retest correlation.

	Cronbach's $\alpha$	Pearson's $r$ /Spearman's rho for test-retest reliability
<i>Total score AIR-S-NOR</i>		
Total sample	.87	.86
Typically developing	.89	.86
Intellectual disability	.82	.86
<i>Capacity subscale</i>		
Total sample	.86	.82
Typically developing	.88	.83
Intellectual disability	.80	.84
<i>Opportunity subscale</i>		
Total sample	.82	.79
Typically developing	.85	.77
Intellectual disability	.75	.80

The two-component solution explained a total of 40.84% of the variance, compared with over 62% explained by the six-component solution. Component 1 contributed 29.80% and component 2 contributed 11.04%. There was a moderate negative correlation between the two factors ( $r = -.308$ ), so the Oblimin rotation solution was performed to aid in the interpretation of these two components. The pattern matrix provided by the Oblimin rotation showed a very clear two-component solution, where all the items on component 1 are capacity items, and all but one of the items on component 2 are opportunity items. The Cap8 item loaded moderately ( $-.32$ ) and inappropriately onto the opportunity component, but it still loaded more strongly ( $.55$ ) on the capacity component. The structure matrix showed strong correlations between most of the capacity items and component 1, and between opportunity items and component 2, indicating a good discrimination between the factors (Table 2). For the capacity component, the lowest factor loading for capacity items was  $.36$  for the Cap2 item, which was still higher than the highest loading (Opp3, loading at  $.33$ ) on the capacity component of an opportunity item. The opportunity component also showed good discrimination, with the lowest loading opportunity item (Opp1, loading at  $-.61$ ) still loading higher than the highest loading capacity item on the opportunity component (Cap8, loading at  $-.49$ ).

To avoid double-barrelled items in the AIR-S-NOR, three items from the AIR-S capacity subscale were split up in two separate items each, resulting in three new items: Cap2, Cap4 and Cap10. However, upon investigation, two of these new items (Cap2 and Cap10) loaded the lowest on the capacity component, and they had low values on the corrected item total correlation ( $.27$  and  $.26$ , respectively). On the other hand, the Cap4 item loaded very high on the capacity component, and it had a moderate value on the corrected item total correlation ( $.46$ ). Therefore, PCA with Oblimin rotation was repeated with the Cap2 and Cap10 items removed. This resulted in a 19-item scale, with 13 capacity items and six opportunity

**Table 2.** Pattern and structure matrix for PCA with Oblimin rotation of two factor solution.

Item	Pattern coefficients		Structure coefficients		Communalities
	Component 1	Component 2	Component 1	Component 2	
Cap5	<b>.709</b>	.080	<b>.684</b>	-.138	.473
Cap11	<b>.706</b>	.142	<b>.662</b>	-.075	.456
Cap4	<b>.687</b>	.095	<b>.658</b>	-.117	.441
Cap12	<b>.660</b>	-.049	<b>.676</b>	-.252	.458
Cap15	<b>.647</b>	-.170	<b>.699</b>	-.369	.514
Cap3	<b>.589</b>	-.181	<b>.644</b>	-.362	.445
Cap8	<b>.553</b>	-.317	<b>.651</b>	-.488	.515
Cap6	<b>.537</b>	-.260	<b>.617</b>	-.426	.442
Cap13	<b>.503</b>	-.185	<b>.560</b>	-.340	.345
Cap7	<b>.487</b>	-.246	<b>.563</b>	-.396	.372
Cap1	<b>.484</b>	-.189	<b>.425</b>	.040	.213
Cap9	<b>.454</b>	-.242	<b>.529</b>	-.382	.332
Cap14	<b>.415</b>	-.024	<b>.423</b>	-.152	.179
Cap10	<b>.405</b>	.063	<b>.386</b>	-.062	.152
Cap2	<b>.359</b>	.008	<b>.357</b>	-.103	.127
Opp6	-.127	<b>-.789</b>	.116	<b>-.749</b>	.576
Opp2	-.067	<b>-.787</b>	.175	<b>-.766</b>	.591
Opp5	.045	<b>-.747</b>	.276	<b>-.761</b>	.581
Opp4	.100	<b>-.667</b>	.305	<b>-.698</b>	.496
Opp3	.134	<b>-.650</b>	.335	<b>-.692</b>	.495
Opp1	.047	<b>-.592</b>	.229	<b>-.606</b>	.370

Note: Bolded items indicate major loadings for each item.

items. The pattern matrix showed a very similar separation of the capacity and opportunity subscales, as with the 21-item scale. All items loaded above .42 on their respective components, but the Cap8 item showed again some loading (.304) on the opportunity component. The components correlated moderately ( $r = .32$ ). The capacity subscale without the Cap2 and Cap10 items had a Cronbach alpha value of .86, which was the same value as when the items were included. Given this result, the authors decided to retain Cap2 and Cap10 in the AIR-S-NOR.

Overall, the results of this analysis support the bi-dimensionality of the AIR-S-NOR, as Shogren et al. (2008) and Chou et al. (2015) also found for the AIR-S.

### Functional equivalence

Functional equivalence can be regarded as the sum of conceptual equivalence, item equivalence, semantic equivalence, operational equivalence and measurement equivalence, and it refers to the degree to which a questionnaire does what it is intended to do in both the source culture and the target culture (Herdman, Fox-Rushby, and Badia 1998). The study presented in this article indicates that there is good conceptual, semantic and measurement equivalence between the AIR-S and the AIR-S-NOR. Item equivalence may be slightly lower due to the limited experience that many Norwegian students have with practising the component skills of self-determination.

The change from a five-point to a four-point Likert scale as well as the adaptations to double-barrelled items decrease the operational equivalence between the AIR-S and AIR-S-NOR, and these alterations may make cross-cultural comparisons difficult. Total scores obtained from the AIR-S-NOR will not automatically compare to results obtained from studies with the AIR-S.

However, the high measurement equivalence indicates that the AIR-S-NOR is a reliable assessment tool for measuring self-determination in Norwegian students, and so, this study may provide an important contribution to the disability research field in Norway.

### Discussion

The aim of this study was to perform an adaptation and validation of the AIR-S for use in Norwegian research and educational contexts. A critical analysis of equivalence indicates that the AIR-S-NOR provides a reliable way of assessing students' level of self-determination. Self-determination for persons with intellectual disability has received considerable attention over the years in Norway. However, reliable measures to assess self-determination were so far not available in Norwegian. This study contributes to filling this gap by adapting and validating the AIR-S-NOR, but further work is needed to make a variety of assessment tools available in Norway, so that the construct's full complexity can be measured.

Whilst the original AIR-S has been used in a number of international research studies where students with learning disabilities, developmental disability or intellectual disability completed the scale (e.g. Shogren et al. 2008), little information was provided in these studies on how the self-assessment of the students was administered, and which kind of scaffolding was given to help students complete the assessment. In the user-guide to the original AIR-S, some adaptations for students with special needs are suggested, such as reading aloud the statements to the students and providing them with examples. However, our pilot study

showed that this was not sufficient support for Norwegian students with intellectual disability, as they struggled especially with the items on the capacity index, which require skills in abstract reasoning and self-reflection. Therefore, we opted for structured interviews with extra scaffolding. This scaffolding included giving visual support, rephrasing statements into an interrogative format, splitting up double-barrelled questions, providing examples, practicing using the Likert-scale, and alternating between questions from the 'What I do' and 'How I feel' indexes. As this support seemed necessary to get reliable answers from the students, it is in place to wonder whether this may be due to students' lack of experience with practicing self-determined behaviour and with talking about abstract skills such as planning and goal achievement.

### ***Implications for practice and future research***

International research has consistently shown that levels of self-determination correlate positively with improved post-school outcomes (Shogren, Wehmeyer, Palmer, Rifenshield et al. 2015), and therefore, schools do wisely in teaching their students component skills of self-determined behaviour. With a reliable assessment tool for self-determination now being available in Norway, researchers and teachers will have the possibility to evaluate the effect of interventions aimed at improving students' levels of self-determination. Access to a proper measurement instrument may also aid teachers in operationalising the complex construct of self-determination into specific teachable skills. Teachers may also wish to engage in discussions with their students to explore perceived capacity and opportunity for self-determined behaviour, and the relationship between these two components.

### ***Limitations of the study***

The small sample size sets limitations to the statistical findings in this study. Exploratory and confirmatory factor analysis could not be performed, but PCA supports the structure of the scale. Data analysis showed a small but significant difference in self-determination level between typically developing students and students with intellectual disability, but a type-I error cannot be ruled out. Alterations to the scale may make cross-cultural comparison of scores difficult, and researchers should proceed with caution when wanting to undertake such studies. Also, this study did not investigate the sensitivity of the scale to assess the effect of self-determination interventions, and further research is required here.

An important aspect to consider with the study is the different *modi operandi* for the data collection with typically developing students and those with intellectual disability. Whilst the typically developing students filled out the AIR-S-NOR by themselves under the guidance of the first researcher, the students with intellectual disability got more substantial support using visual support in an interview situation. The provision of this support for the sample of students with intellectual disability but not for the typically developing students may have affected the students' answers, as there may be stronger social bias in interview situations. However, social bias usually leads to more positive answers, whilst the students that were interviewed scored significantly lower than the ones that answered by survey.



## Conclusion

Based on a model of equivalence, AIR-S-NOR is considered a reliable measurement for students' capacity and opportunity for self-determination, thus opening up for its use in Norwegian educational and research practices. The AIR-S-NOR shows respectable psychometric properties. Due to the adaptations that were made in the instruments, researchers should proceed with care when using the AIR-S-NOR in comparative studies. When using self-reports with students with intellectual disability, sufficient scaffolding as described in this article should be provided to enable students to answer the questions appropriately.

## Note

1. The index 'Opportunities at home' was removed from the Opportunity subscale in this research.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Notes on contributors

*Veerle Garrels*, MEd, is a doctoral student in special education at the University of Oslo, Norway. Her research interests are intellectual disability and self-determination.

*Mats Granlund*, PhD, is professor of psychology and disability research at the Institute of Disability Research, School of Health Science, at the University of Jönköping, where he is leader of the research group CHILD. He is professor II at the Department of Special Needs Education at the University of Oslo.

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## Attachment 2

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## Goal setting and planning for Norwegian students with and without intellectual disabilities: Wishing upon a star?

Veerle Garrels

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RESEARCH ARTICLE



# Goal setting and planning for Norwegian students with and without intellectual disabilities: Wishing upon a star?

Veerle Garrels

Department of Special Needs Education, University of Oslo, Oslo, Norway

## ABSTRACT

Being able to set personal high-quality goals and having the skills to make plans for goal attainment are associated with higher performance, increased student involvement at school, and higher levels of self-determination. This study examines self-reported goals of 83 Norwegian elementary and lower secondary school students with and without intellectual disabilities. The study also looks into whether students feel that they learn goal setting and planning skills at school. Findings suggest that students are able to identify process and product goals for themselves. Most students set academic goals for themselves, followed by career goals and sports-related leisure time goals. No significant differences were found between typically developing students and students with intellectual disabilities. While roughly two-thirds of all students reported that they feel encouraged to set goals for themselves at school, almost 60% of all students expressed that they did not learn planning skills at school. This finding indicates the need to assist teachers with instructional materials for how to teach students these important skills for self-determination.

## ARTICLE HISTORY

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## KEYWORDS

Goal setting; intellectual disability; self-determination; autonomous learning

## Introduction

The French author Antoine de Saint Exupéry (1900–1944) allegedly said that ‘A goal without a plan is just a wish’. The phrase may have lost some of its original vigour due to a certain overuse on interior design frames, but the content has not expired. Goal setting and planning are considered essential skills for self-determination (Wehmeyer et al. 2007, 8), and being able to set goals and to plan for goal achievement is crucial for a person’s performance (Locke and Latham 2006). However, goal setting and planning are not innate qualities, but are instead skills that need to be learned. This study aims to investigate the goals that Norwegian elementary and lower secondary school students with and without intellectual disabilities set for themselves, and whether they feel that they learn the necessary skills to set goals and plan at school. Findings from the study may shed light on students’ goal setting and planning in today’s educational practice, and provide guidelines for future practice and research.

**CONTACT** Veerle Garrels  [veerle.garrels@isp.uio.no](mailto:veerle.garrels@isp.uio.no)

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## Background

For students with disabilities, skills in goal setting and planning have been identified as component elements of self-determined behaviour, together with other proficiencies such as being able to express preferences, to make choices and to self-regulate (Wehmeyer et al. 2007, 8). Self-determination has been described by Shogren et al. (2015) as a 'dispositional characteristic manifested as acting as the causal agent in one's life. Self-determined *people* (i.e. causal agents) act in service to freely chosen goals. Self-determined actions function to enable a person to be the causal agent in his or her life'. Thus, knowing how to set goals and being able to choose goals freely are considered fundamental skills of self-determination, which in turn may be an important predictor for post-school outcomes for students with disabilities (Wehmeyer and Palmer 2003). For students with intellectual disabilities, research shows that goal setting has a positive impact on their academic performance (Copeland and Hughes 2002). Also, students with intellectual disabilities who took part in a goal-setting intervention identified several benefits for themselves, such as becoming more organised, experiencing less stress over school assignments, and feeling more confident (Wehmeyer et al. 2000). Figarola et al. (2008) found that goal setting, combined with the self-monitoring of progress, leads to improved math fact automaticity for elementary school students with mild intellectual disabilities. For persons with autism spectre disorders, research suggests that interventions which include a self-set goal component may improve independent functioning (Carr, Moore, and Anderson 2014). Coddling, Lewandowski, and Eckert (2005) further found that student-selected goals and performance feedback were effective in increasing math fluency in elementary school students with ADHD. Thus, there seems to be ample empirical evidence for the benefits of goal setting for students with disabilities. Providing students with opportunities to practice goal setting and to experience goal achievement may be important motivational elements for their academic and non-academic performance.

However, goal setting and planning are important skills not only for students with disabilities, but for all students. Developments in educational research and practice over the past decades have led to a paradigm shift from teacher-centred to student-centred learning (Moeller, Theiler, and Wu 2012). This new perspective on the student as an autonomous participant in her own learning process emphasises the role of self-regulated learning (Furtak and Kunter 2012). The teacher's main function is not only to deliver instructions and knowledge to the students, but also to guide them in their learning process (*ibid.*). For this student-centred learning process to be successful, students need to identify themselves as active learners in their own education (Coon and Walker 2013). Coon and Walker (2013) describe this active agency in the learning process as 'educational citizenship', which implies that students use self-determined actions in their learning process, and that they should have the right to exercise some authority over their educational goals. When students are allowed to take part in their own goal setting, this encourages learner autonomy and stimulates autonomous motivation (Moeller, Theiler, and Wu 2012). Students who get to work on intrinsic educational goals, i.e. goals that they have identified themselves and that they have a personal motivation for, may experience positive consequences at school, such as being more persistent in school work, seeking more challenging educational tasks, showing more creativity and experiencing higher levels of school satisfaction (Guay, Ratelle, and Chanal 2008). Active student engagement throughout the learning process and autonomous

goal setting can also lead to higher achievement and higher levels of self-efficacy and self-regulation (Furtak and Kunter 2012; Moeller, Theiler, and Wu 2012). When students are successful in achieving their goals, this in turn may influence subsequent goal setting, as students continue to set higher goals for themselves, thus resulting in a positive upward spiral of continuous higher performance (Gross et al. 2014; Taing et al. 2013). Stevenson (2015) found that the implementation of a goal-setting intervention was closely related with increased time-on-task behaviour and reduced latency to task engagement for students with reading difficulties, thus enhancing academic engagement and student achievement. Graham et al. (1992) also reported evidence of the benefits of goal setting on the writing skills of students with learning disabilities, as the awareness of goals mobilises students' efforts and motivates the use of successful strategies to achieve the target goals.

Autonomy in the learning process develops largely through practice and feedback from teachers. Students need to be taught the necessary learning strategies and how to use these to become active and agentic learners (Moeller, Theiler, and Wu 2012). Copeland and Hughes (2002) also found that more frequent training in goal setting may lead to stronger effects on task performance; hence, providing students with opportunities to set goals for themselves may improve academic outcomes. The quality framework of the Norwegian National Curriculum for Knowledge Promotion in Primary and Secondary Education and Training (Department of Education 2006) emphasises this need to facilitate pupil participation in education and to teach students the strategies that will prepare them for future democratic decision-making processes. The framework states that students should be provided opportunity to actively cooperate in their learning process, e.g. by choosing tasks and by taking part in decisions regarding their own learning. This implies that students should be allowed and be enabled to participate in planning, carrying out and assessing their education. This applies also to students with special needs (Department of Education 2006).

### ***Goal-setting theory***

In their goal-setting theory, Locke and Latham (2006) describe the setting of goals as a discrepancy-creating process. Goals create a constructive mismatch between present performance and the goal that one wishes to achieve, thus mobilising a person's effort to bridge the gap between the person's current state and what he or she wants to be doing in the future (Latham and Locke 2006). Latham and Locke (2013) describe life itself as a process of goal-produced action: goals are the primary source of a person's motivation, and the discrepancies that these goals form are created volitionally. Goal-directed action is an essential aspect of human life, and setting goals provides people with a sense of purpose (Locke and Latham 2006). In social cognitive theory, Bandura (2013) sees goal setting and goal attainment as dual control systems for the regulation of motivation and action: proactive discrepancy production, i.e. setting a goal, operates in concord with reactive discrepancy reduction, i.e. directing behaviour in order to attain that goal.

Goal-setting theory is built on two core empirical findings: (1) there is a linear relationship between goal difficulty and performance, i.e. more difficult goals lead to higher performance, at least until the limit of ability is reached, and (2) difficult goals lead to higher performance than no goals and vague or abstract goals, such as 'to do one's best' (Latham and Locke 2013). One of the hypothesised mechanisms behind these findings is that goals direct attention and encourage behaviour that is likely to lead to goal attainment, and this happens at the

expense of non-relevant behaviour (Locke and Latham 2006). Latham and Locke (2013) state that goals encourage persistence, especially in the case of difficult goals, and people tend to spend more time working on higher goals than on vague or easy goals.

### **Goal characteristics**

Goals may be organised according to different characteristics, such as goal category, goal source and goal content. Goal categories are commonly divided into product goals, which identify an end result, and process goals, which describe actions that can lead to the attainment of product goals (Locke and Latham 2013). In a meta-analysis of studies on process goals, Seijts, Latham, and Woodwork (2013) found that individuals generally perform better with process goals than with product goals. This seems especially the case when individuals have not yet acquired the knowledge or skills to perform a task effectively, as process goals direct attention on how to obtain the necessary skills rather than focusing on the outcome itself. Process goals tend to increase self-efficacy and self-regulation, and they may create tolerance for negative feedback, which in turn may improve task performance (Seijts, Latham, and Woodwork 2013). Zimmerman and Kitsantas (1997) found that a premature focus on product goals may lead to lower levels of self-efficacy and intrinsic interest, while process goals tend to increase mastery. Locke and Latham (2013) argue that product and process goals may work best combined. It may be important to notice here, however, that when setting goals, younger students are more likely to describe product goals, and without adult prompting, students may not be able to set process goals (Sands and Doll 2000). Students may, for example, be likely to set a product goal such as 'getting better grades', but they may encounter difficulties identifying the necessary strategies to achieve that goal.

Another important trait of goals is their source of origin. Goals may be self-set, set in cooperation with others, or they may be assigned by others. Research shows that all these goal sources are effective for improving performance (Locke and Latham 2013). Codding, Lewandowski, and Eckert (2005) found evidence that students benefit from the self-selecting of goals as opposed to being assigned a goal by others, but other researchers (e.g. Gross et al. 2014; Swain 2005) argue that younger students may not have adequate experience with self-selecting realistic goals, and that they are likely to need ongoing training in this. As such, the type and quality of the goal may be of more crucial importance than the source of the goal. However, while the source of a goal may not influence performance drastically, it may play an important role in the self-regulation and self-determination of students. After all, a central element in being self-determined is being able to act upon *self-chosen* goals (Shogren et al. 2015). Apart from increasing students' sense of agency, participation in the goal-setting process may also enhance students' self-motivation (Guay, Ratelle, and Chanal 2008). Possibly, students may deem self-chosen goals more important than goals that are imposed upon them, and the attainment of self-chosen goals may then lead to higher levels of subjective well-being. For students who lack experience in setting goals for themselves, a possible alternative may be 'guided goal setting', where students can choose a goal from a preset list of possible goals, thus allowing a certain degree of choice and participation (Locke and Latham 2013; Shilts, Horowitz, and Townsend 2004).

The meaning of goal content seems to have received less attention in research than goal category and goal source. However, goal content does matter, as students seem to make significantly more progress on goals that are intrinsic in their aspirational content

(Hope et al. 2015). Personal, intrinsic goals seem to function as natural reinforcers, and are associated with greater positive affect (Hope et al. 2015). Fryer, Ginns, and Walker (2014) also found evidence that externally regulated goals, such as school grades, seem to have low impact on motivation and learning, whereas internally regulated goals may have a positive effect on student motivation. Indeed, even though externally regulated goals may be self-chosen, they may not be perceived as personal goals, and they may not have the person's complete commitment as internally regulated goals do (Sheldon 2002). On the other hand, goals that have an intrinsic content are usually pursued for self-concordant reasons, making goal attainment more likely (Sheldon 2002). Within school contexts, Bong (2001) argues that students may be more likely to phrase goal contents that reflect areas in which they feel confident in their abilities. Thus, goal content may be the result of interplay between personal interests and personal expectations of success.

### **Purpose of the study**

The aim of this study is to gain insight in the nature of goals that students with and without intellectual disabilities set for themselves. The theoretical framework highlights the benefits of process goals, and it may be of interest to examine whether students mostly identify process or product goals. Further, an analysis of the goal content may provide information about the areas in which students feel that they can influence their performance and where they experience self-determination. The study also wishes to investigate whether students learn goal-setting and planning skills at school. Finally, the study examines whether there are significant differences between typically developing students and students with intellectual disabilities in the nature of the goals that they set and the extent to which they learn goal setting and planning at school.

The following research questions are addressed in this study:

- (1) Which goal content and goal category do students identify most frequently?
- (2) Are there any significant differences in goal content and goal category between students with and without intellectual disabilities?
- (3) Do students feel that they learn goal-setting and planning skills at school?
- (4) Are there any significant differences between students with and without intellectual disabilities in learning goal-setting and planning skills at school?

To provide answers to these research questions, students were asked to fill out a measure for self-determination that focuses on goal setting and planning. The results from the study may offer useful information for educators and provide guidelines for future practice.

## **Method**

### ***Participants***

Eighty-three elementary and lower secondary school students (39 boys) aged 9–17 ( $M = 12.69$ ,  $SD = 1.58$ ) were recruited from 11 schools in Eastern Norway as part of a larger study investigating self-determination skills of elementary and lower secondary school students. Consent for participation in the study was obtained from the students' parents and from the students themselves. Sixty-five per cent ( $n = 54$ ) of the students were typically

developing and received their education in mainstream settings. Thirty-five per cent ( $n = 29$ ) of the students were identified by their teachers as having mild intellectual disabilities, and they received their education in special education classrooms, i.e. a segregated educational setting.

Even though the Norwegian Education Act of 1975 favours inclusion of all pupils in mainstream settings, research indicates a trend towards segregation within mainstream schools, especially for children with intellectual disabilities for whom individually adapted education within the regular classroom is not a sufficient facilitation (Wendelborg and Tøssebro 2008). This segregated educational setting was also found for all intellectually disabled participants in this study, as they were taught in special classrooms within regular local schools. This educational setting is characterised by a high teacher–student coverage, where the special educator has the main responsibility for a small number of students, and is assisted by paraprofessionals. Students from different grade levels are often placed together within the same classroom, based on their level of functioning rather than on their biological age. All students in the special education classrooms have individual educational plans (IEPs), which specify their educational goals for the academic year.

### ***Instruments***

For this study, all students completed the AIR-S-NOR, i.e. the cross-culturally adapted version of the American Institute for Research (AIR) Self-Determination Scale (Garrels and Granlund forthcoming; Wolman et al. 1994). The AIR-S-NOR consists of 21 items, and it assesses students' capacity and opportunity for self-determined behaviour by means of three indexes: 'What I do', 'How I feel' and 'What happens at school'. Response alternatives range from 'never' to 'always' on a four-point Likert scale. The questionnaire also includes three open-ended questions, asking students about a goal that they are currently working on, what they are doing to achieve their goal, and how well they are doing in attaining that goal. In this study, answers from the open-ended question about which goal the student is working on, as well as the answers to two of the questions from the 'What happens at school'-index form the data basis for analysis. The typically developing students completed the AIR-S-NOR in their classrooms under guidance of the researcher, while the students with intellectual disabilities answered all the questions in a one-to-one interview with the researcher.

### ***Procedure***

A qualitative analysis of the goal content was performed following the steps for qualitative content analysis described by Zhang and Wildemuth (2009). Goals identified by the students in the open-ended questions of the AIR-S-NOR were entered verbatim into a Microsoft Word table for coding purposes. A coding key was used, so that no identifying information was included in this table. Although students were asked to name only one goal in the questionnaire, several students identified multiple goals. As those students did not rank their goals in a specific order of importance, all goals were maintained, thus leading to a total of 112 goals for 83 students. After preparing the data, the students' goals were first sorted into several categories following the coding scheme from a similar study on goal content analysis for middle and high school students with disabilities by Williams-Diehm et al. (2010). Then a further refinement of the categories was performed, as a large number

**Table 1.** Coding scheme for goal analysis.

Coding number	Coding description
<i>Goal content</i>	
0	No goal
1	Academic goal (includes goals related to specific school subjects, tests, work completion)
2	Classroom management goal (includes goals such as following classroom rules, being concentrated at school and paying attention)
3	Sports-related leisure time goal (includes goals related to after-school sports activities, participation in sports clubs, individual sports goals)
4	Other than sports-related leisure time goal (includes goals related to after-school activities such as music school, activities at home, etc.)
5	Social goals (includes goals related to interaction with peers or adults)
6	Career goals (includes goals for future employment, university choices, etc.)
<i>Goal category</i>	
0	No goal
1	Product goal (i.e. goals that define a certain outcome, such as joining a sports team, earning certain grades, etc.)
2	Process goal (i.e. actions that help in the achievement of a certain goal)

of students specifically identified sports-related goals, a category which was not present in the study by Williams-Diehm et al. (2010). This generated an initial list of eight coding categories for goal content: (a) social goal, (b) academic goal, (c) long-term goal for academics, (d) sports-related leisure time goal, (e) other than sports-related leisure time goal, (f) classroom management goal, (g) long-term goal for non-academics and (h) no goal. Goals were also coded according to being product or process goals. To validate this coding scheme, 25% of the goals were rated independently by two researchers to check for inter-rater reliability. As a result, the original codes for the content areas 'academic goal' and 'long-term academic goal' were merged into one single category of 'academic goals', as many of the students' answers were not specific enough to reliably define them as either one or the other, and the category 'long-term goal for non-academics' was renamed 'career goal' (Table 1). After this adjustment, inter-rater agreement was assessed for both goal content and goal category using Kappa Measure of Agreement. A Kappa of .5 indicates moderate agreement, and a value above .7 represents very good agreement (Pallant 2013). The resulting inter-rater reliability for goal content was calculated to a Kappa Measure of Agreement value of .908, and for goal category the value was .857. These values indicate excellent inter-rater reliability. After this level of consistency was achieved, the remaining goals were coded into the final categories.

### **Analysis**

Following the process of qualitative content analysis, data were further analysed quantitatively. All goal analysis codes were entered into SPSS version 22, together with additional data such as age, developmental characteristics and the students' Likert scale answers to the items from the AIR-S-NOR that asked about their opportunities at school for setting goals and making plans ('People at school encourage me to set my own goals to get what I want or need' and 'At school, I have learned how to make plans to meet my goals'). Using the coding key in this process allowed for matching student characteristics to the goal content and goal category codes, so that possible correlations between developmental characteristics, goal content and goal category could be examined. Descriptive statistics were used to describe

the sample and the frequency of the goal content, the goal category and the students' Likert scale answers to the goal setting and planning questions. Chi-square for independence was calculated to identify any significant differences between students' developmental characteristics and goal content and category. The non-parametric Mann–Whitney *U*-test was used to examine any possible differences between the answers that students with and without intellectual disabilities provided on the Likert scale questions.

## Results

### ***Research question 1: Which goal content and goal category do students identify most frequently?***

Goal content analysis shows that, for all students combined, the goals that were reported most often were academic goals and career goals (frequency of 25% each), followed by sports-related leisure time goals (23%). To a lesser extent, students identified non-sports-related leisure time goals (10%), social goals (7%) and classroom management goals (5%).

Regarding goal category, students generally reported product goals more frequently than process goals (59% vs. 36% respectively). Sorted by goal content, process goals represented 66% of all academic goals, 83% of all classroom management goals, 48% of all sports-related leisure time goals and 18% of all social goals. All career goals that students identified for themselves were formulated as product goals, such as e.g. 'becoming a professional cross-country skier'.

### ***Research question 2: Are there any significant differences in goal content and goal category between students with and without intellectual disabilities?***

Descriptive data analysis shows that students with intellectual disabilities reported academic goals more often (34%) than their typically developing peers (20%). Career goals accounted for 32% of the goals set by students with intellectual disabilities, compared to 21% for typically developing students. Students with intellectual disabilities reported leisure time goals less frequently than typically developing students (25% vs. 38% respectively). None of the students with intellectual disabilities reported classroom management goals, while 8% of the goals reported by typically developing students belonged to this content category (Table 2). Although a frequency count shows certain differences in goal content for students with and without intellectual disabilities, a chi-square test for independence indicated no significant association between goal content and developmental characteristics,  $\chi^2(6, n = 112) = 10.1, p = .12, \pi = .30$ .

For goal category, students tended to focus mostly on product goals, with minimal differences between disability and typically developing student groups.

### ***Research question 3: Do students feel that they learn how to set goals and make plans for goal attainment at school?***

A frequency count of the students' answers to whether they feel encouraged to set goals for themselves at school, shows that 38% of all students never or rarely feel encouraged to



**Table 2.** Goal analysis.

	Total	Intellectual disability	Typically developing
<i>Goal content analysis</i>			
No goal	2	0	3
Academic goal	25	34	20
Classroom management goal	5	0	8
Leisure time goal sports-related	23	18	27
Leisure time goal non-sports-related	10	7	11
Social goal	7	9	6
Career goal	25	32	21
Missing data	3	0	4
<i>Goal category analysis</i>			
No goal	2	0	3
Product goal	59	66	55
Process goal	36	34	38
Missing data	3	0	4

Note: All numbers in percentage.

do so, while 62% of all students feel often or always encouraged. Thus, almost two-thirds of all students feel that they can engage actively in goal-setting processes at school.

To the question whether students feel that they learn how to make plans to help them achieve their goals, 57% of all students respond that they never or rarely learn this at school, while 43% of all students answer that they often or always do so.

#### ***Research question 4: Are there any significant differences between students with and without intellectual disabilities in learning goal-setting and planning skills at school?***

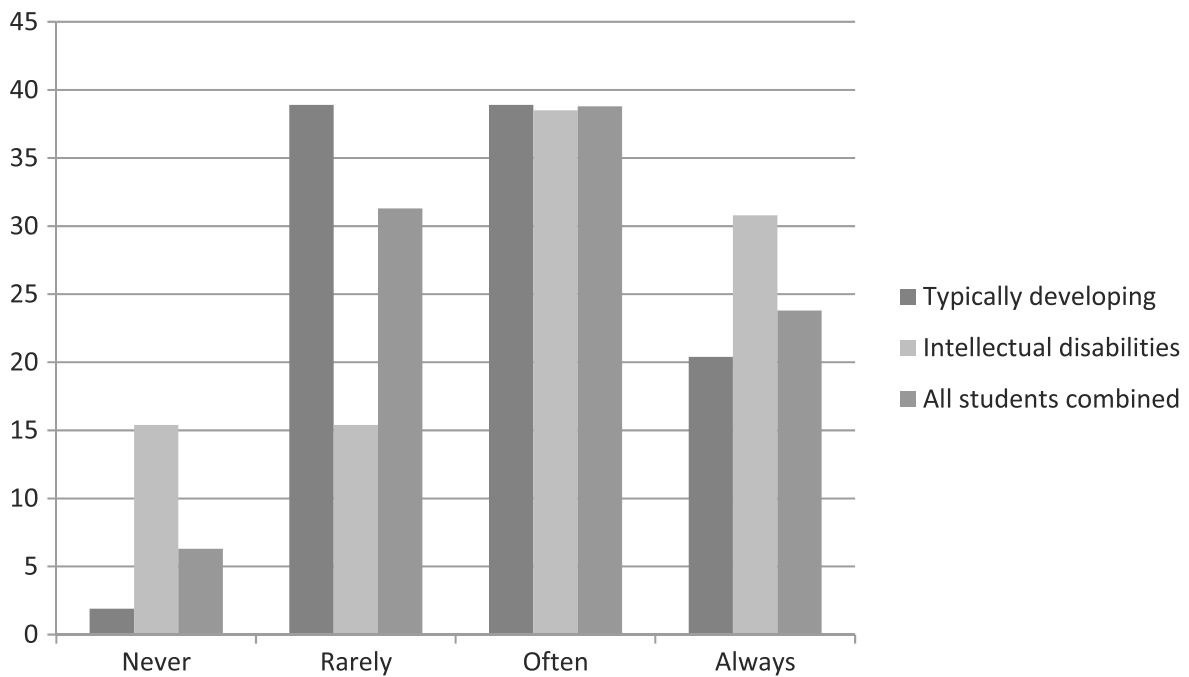
A Mann–Whitney *U*-test revealed no significant difference in the opportunities to set goals at school for students with intellectual disabilities ( $Md = 3, n = 26$ ) and typically developing students ( $Md = 3, n = 54$ ),  $U = 643, z = -.640, p = .522, r = .07$ .

For the question on whether students learn how to make plans for goal attainment, the Mann–Whitney *U*-test showed no significant difference between typically developing students and students with intellectual disabilities,  $U = 700, z = -.30, p = .76, r = .03$ .

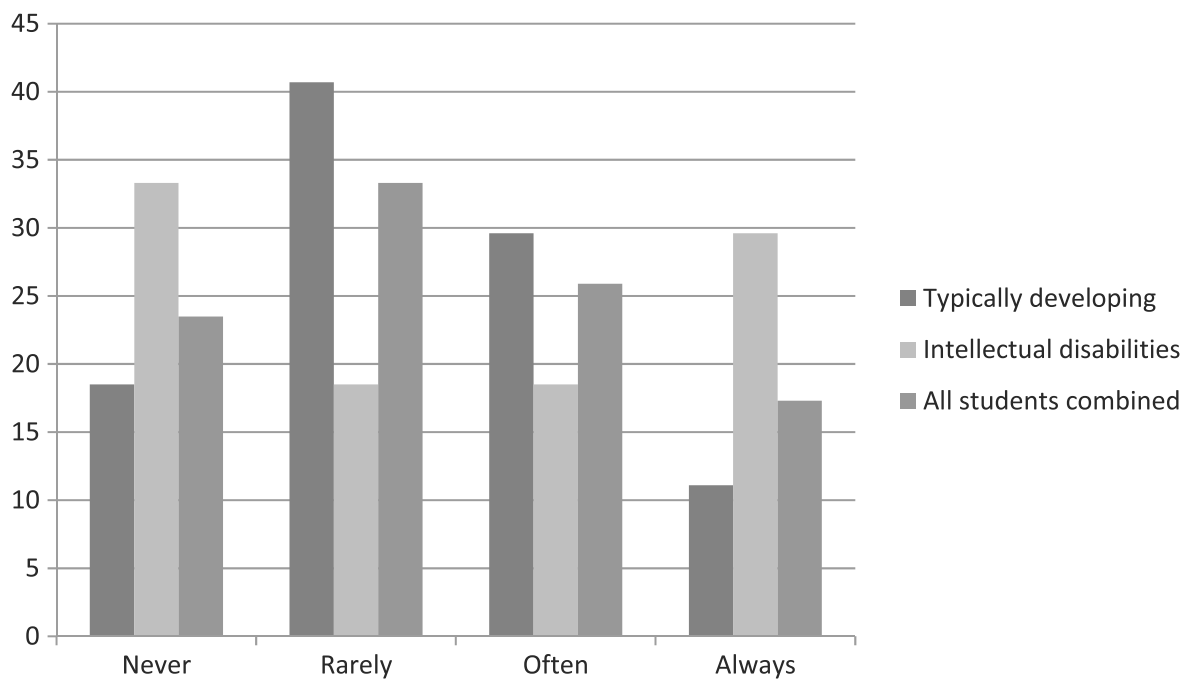
Although no significant differences were found between groups, a certain trend in the data might be identified: students with intellectual disabilities state slightly more often that they feel encouraged by their teachers to set goals for themselves, and they also report slightly more frequently that they learn how to make plans at school (Figures 1a and 1b).

## **Discussion**

This study aimed to provide insight in the goal-setting behaviour of Norwegian elementary and lower secondary school students. Typically developing students and students with intellectual disability were asked to complete the AIR-S-NOR as a measure of self-determination levels. Data analysis in this study occurred on the basis of the instrument's open-ended question about a goal that the student was currently working on, as well as two Likert scale questions about opportunities for goal setting and planning at school.



**Figure 1a.** Opportunities at school: Students feel encouraged at school to set goals for themselves. Note: Numbers are in percentage.



**Figure 1b.** Students feel that they learn how to make plans for goal attainment at school. Note: Numbers are in percentage.

Data analysis shows that, for all students combined, the reported goals comprised mostly academic goals, career goals and sports-related leisure time goals. Leisure time goals that were not sports-related, social goals and classroom management goals were reported less frequently by all students. The high prevalence of academic goals is consistent with findings

in previous research studies (e.g. Williams-Diehm et al. 2010), and highlights the perceived importance of school performance for elementary and lower secondary school students.

The generally high emphasis on sports-related leisure time goals for all participants may reflect a perception of the sports arena as a place for performance and achievement. In sports, students may experience a higher degree of autonomy and self-development, so that they feel more encouraged to set personal goals for themselves. As sports activities are largely voluntary, this may influence students' feelings of intrinsic and autonomous motivation for such activities.

No significant differences in goal content were identified between students with intellectual disabilities and typically developing students. A slight trend in the current data-set might seem to indicate that students with intellectual disabilities report academic goals and career goals more frequently than their non-disabled peers, while typically developing students may seem to focus more on goals that are not immediately school-related. Further research with larger samples and different methods of investigation is needed to explore these possible differences further.

Beside goal content analysis, goal category was also explored. Here, students reported product goals more often than process goals (59% vs. 36%), but this difference can mostly be explained because of all the career goals being formulated as product goals. For academic goals, about two-thirds of all goals were formulated as process goals, while about half of all sports-related leisure time goals were process goals. This indicates that students are capable of formulating high-quality goals for themselves, where they focus more on skills that they need to acquire to achieve a product goal, rather than on the product goal itself. This stands in contrast to the hypothesis posed by Sands and Doll (2000), stating that younger students would experience difficulties formulating process goals for themselves. A possible explanation for this may be the general focus in Norwegian education on learning goals rather than on product goals. For example, Norwegian elementary school students do not get grades on their academic schoolwork, thus redirecting attention towards learning goals rather than towards product goals. As such, being able to set learning goals may be the result of having had practice in doing so.

Despite students showing adequate goal-setting capacity, 4 out of 10 students state that they do not feel encouraged to set goals for themselves at school, and 6 out of 10 students report that they do not learn how to make plans to achieve their goals. This indicates a gap between school practice and the guidelines of the Norwegian Department of Education (2006), which state that students should be allowed to participate actively in their academic goal setting and planning. All students that participated in the study showed that they were able to identify goals for themselves, but with a majority of the students not learning how to make plans to reach their goals, one can ask whether these goals in many cases remain nothing more than wishes. Whether students attain their goals or not may be left to coincidences, as they do not learn the necessary skills that will help them in attaining their goals. Wehmeyer, Agran and Hughes (2000) found that teachers do not feel familiar with strategies for how to teach goal-setting and planning skills to their students, and that they lack the instructional materials to do so. This may be a possible explanation for the current study's findings as well.

### ***Implications for future research***

While this study looked into goal category, goal content and the extent to which students learn goal-setting and planning skills at school, the data are reported directly by the students and the source of the goals reported by students was not examined. Neither did the study investigate the students' underlying motivations for the goals that they had chosen. Both goal source and the motive for selected goals, i.e. whether the goal is in concordance with personal interests, values and needs, may play an important role in the students' perception of autonomy and self-determination. Therefore, further research is required here.

The present study operated with small groups of typically developing students and students with intellectual disabilities, and this may have contributed to finding no significant differences between the two groups. More research with bigger samples is needed in order to establish whether the findings in this study are representative of the larger population of students, or whether differences between groups do exist. An interesting research question that raises itself is whether the close teacher–student contact in special education allows for more involvement in the educational process of goal setting and planning than is the case in mainstream education, where teachers need to divide their attention over a larger number of students. Also, it is worthwhile to investigate how students with intellectual disability generalise the concept of goal-setting to activities outside of the school.

The findings in this study are solely based on students' self-reports. While it is important to investigate students' personal opinions and hear their perspectives, future research may include teachers' perceptions as well, in order to compare teacher and student reports, and to gain crucial insight in barriers that teachers face when it comes to teaching goal setting and planning. More extensive knowledge about this could help bridging the gap between theory and practice.

### ***Implications for educators***

Based on the findings from this study, the main implication for educational practice seems that teachers need to be provided with the necessary skills and tools to involve students in goal-setting and planning processes. While several educational programmes have been developed internationally for this purpose, none of these seem to be used systematically in Norway. It would therefore be advisable to make these programmes available in Norway as well, and evaluate their effect on both teacher and student behaviour. For educators, it is important to be aware of the significance for students of being involved and active agents in their own learning processes. Teaching students how to set goals for themselves and how to make plans for goal attainment may help them increase performance and experience a sense of well-being when goals are achieved. This goes for both students in mainstream education and for students in special educational settings.

### **Limitations**

Certain limitations to this study should be taken into consideration. First, data from students with intellectual disabilities were collected by means of structured interviews, while typically developing students filled out the form by themselves in the classroom, under the guidance

of the researcher. These different *modi operandi* may have brought a social bias into the results of the students with intellectual disabilities.

Also, students were not chosen randomly for this study, but were instead selected by the schools that accepted to participate. Therefore, the representativeness of the participants is not known. Students with mild intellectual disabilities were identified by their special educators, without their disability being verified by medical reports.

The small sample size in this study limits results and their interpretations. More research with larger samples is recommended to provide results that are more than preliminary.

## Conclusion

This study investigated the goals that Norwegian elementary and lower secondary school students with and without intellectual disabilities set for themselves. Goal content and goal category were analysed. The study also examined whether students feel that they learn goal-setting and planning skills at school. Goal content analysis shows that students mostly set academic goals, career goals and sports-related leisure time goals. No significant differences were found between typically developing students and students with intellectual disabilities when it comes to goal content. Both typically developing students and students with intellectual disabilities were able to formulate process goals, which are generally considered higher quality goals than product goals. While roughly two-thirds of all students feel encouraged by their teachers to set goals for themselves, around 57% of the students reported that they do not learn how to make plans for goal attainment at school. Thus, while most students seem to be skilled to set goals for themselves, they may lack the strategies to turn these goals into action plans. This indicates the need for teacher training to focus more on how to teach students the necessary skills for becoming autonomous learners and self-determined adults.

## Disclosure statement

No potential conflict of interest was reported by the author.

## Notes on contributor

*Veerle Garrels* is currently a PhD candidate at the University of Oslo, Norway. Her research interests are intellectual disability and self-determination.

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# Attachment 3

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Full length article

## Promoting self-determination for students with intellectual disability: A Vygotskian perspective

Veerle Garrels<sup>a,\*</sup>, Patrik Arvidsson<sup>b,c</sup><sup>a</sup> Department of Special Needs Education, Faculty of Educational Science, University of Oslo, Norway<sup>b</sup> CHILD, Swedish Institute for Disability Research, Jönköping University, Sweden<sup>c</sup> Centre for Research & Development, Uppsala University/Region Gävleborg, Gävle, Sweden

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Scaffolding

## ABSTRACT

Despite weak correlations between IQ scores and self-determination, research indicates that individuals with intellectual disability (ID) show lower levels of self-determination than their non-disabled peers, and that they experience lower effects of self-determination interventions. From a Vygotskian perspective, self-determination skills can be considered complex cognitive abilities that develop through social interaction with and adequate scaffolding by competent tutors. This approach raises the need to look into how self-determination interventions can be adapted to the cognitive profiles of individuals with ID. In this article, the Self-Determined Learning Model of Instruction was used with eight adolescents with mild ID over a three-month period. Typical challenges that were encountered are described, and suggestions for how these challenges can be addressed are discussed. Findings from this study illustrate how the development of self-determination skills may be facilitated when there is congruence between the individual's neurobiological development and the social conditions for development.

## 1. Introduction

Self-determination is a psychological construct that refers to self- (vs. other-) caused action. Self-determined people act volitionally, based on their own free will, i.e. they are causal agents in their own lives (Wehmeyer, Shogren, Little, & Lopez, 2017). This implies that self-determined people have a tendency to think and act volitionally and intentionally in order to obtain self-chosen goals. Such self-determined action is characterized by volitional action, agentic action, and action-control beliefs.

Self-determination is considered an important educational outcome for persons with disabilities, as levels of self-determination are found to correlate positively with desirable adult outcomes such as independent living, employment, financial independence, and potential for social integration and community access (Nota, Ferrari, Soresi, & Wehmeyer, 2007; Shogren, Wehmeyer, Palmer, Rifenshark, & Little, 2015; Wehmeyer & Palmer, 2003). Self-determination is further a significant predictor of perceived quality of life, especially with respect to personal development and personal fulfilment, and as such, higher levels of self-determination may lead to improved wellbeing (McDougall, Evans, & Baldwin, 2010). Research has indicated that individuals with intellectual disability (ID) are less self-determined than their non-disabled peers or peers with other disabilities (Garrels & Granlund, 2017; Shogren, Wehmeyer, Palmer, & Paek, 2013). Also, students with ID seem to have lower effects of self-determination interventions than students with other disabilities such as learning disabilities (Shogren, Palmer, Wehmeyer, Williams-Diehm, & Little, 2012; Wehmeyer et al., 2012). Whilst researchers have identified disability label as a predictor for self-determination, research studies indicate that the correlation between

\* Corresponding author at: Universitetet i Oslo, Institutt for Spesialpedagogikk c/o Veerle Garrels, Postboks 1140 Blindern, 0318 Oslo, Norway.  
E-mail address: [veerle.garrels@isp.uio.no](mailto:veerle.garrels@isp.uio.no) (V. Garrels).

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general IQ scores and self-determination is small; hence, IQ scores are not a good predictor of self-determination levels (Lee et al., 2012; Wehmeyer & Garner, 2003). Instead, it has been suggested that intellectual functioning may interact with environmental conditions (Wehmeyer & Garner, 2003). Individuals with ID frequently find themselves in restrictive and segregated school, work, and living environments, where opportunities for choice making and practicing other self-determination skills may be limited (Björnsdóttir, Stefánsdóttir, & Stefánsdóttir, 2015; Hughes, Agran, Cosgriff, & Washington, 2013; Shogren et al., 2013). These limited opportunities may in turn affect the individual's capacity for self-determination.

However, researchers have also highlighted the need to develop strategies to individualize interventions and supports based on salient personal characteristics (e.g. Shogren et al., 2013). As such, it may be of interest to look into how well self-determination interventions are adapted to how persons with ID perceive and process information with support, and how these interventions may be better tailored to meet the needs of individuals with ID.

### 1.1. Intellectual disability from a Vygotskian viewpoint

ICD-10 and DSM-V define intellectual disability (ID) as a disability characterized by significant impairment in intellectual functioning and adaptive behaviour, with the onset of this condition occurring during the developmental period, i.e. before age 18 (American Psychiatric Association, 2013; World Health Organization, 1999). The constitutive definition of the ID construct underlying this operationalization originates in an interactive social-ecological understanding of disability, which suggests that ID exists in the discrepancy between a person's capacities and limitations as a function of neurobiological impairment and the context in which the person functions (Wehmeyer et al., 2008). This interactive social-ecological understanding is a step forward from the long-standing biomedical model of ID with its one-sided emphasis on biological deficits (AAIDD, 2010). Still, also in the social-ecological model the cognitive impairment in ID seems to be considered a relatively fixed trait, and the interactive aspect enters the model first in the question as to how environmental supports or lack thereof may compensate for or aggravate a pre-existing state of intellectual impairment.

Vygotsky (1979) identifies a relational interactive aspect also within the development of cognition, thus not considering intellectual functioning as a given constant. Humans have an original set of basic mental functions such as attention, sensation, perception, and memory, and these are developed in social interaction into more effective and higher mental functions (Vygotsky, 1979). The 'highest level' of functioning may be limited by biological factors, but e.g. the type of problem solving strategy is socio-culturally determined. Children with an intellectual impairment can learn how to use their basic mental functions more effectively, even if these functions are limited in comparison to children without impairment, and this adaptive process is related to socio-cultural factors. Thus, Vygotsky does not deny that neurobiological deficits may form a weaker foundation for the development of complex cognitive abilities in the child with ID. However, he postulates that any complex cognitive abilities, such as learning, planning, problem solving, etc., initially are social functions before they become internalized. Complex cognitive abilities appear first as an interactive inter-psychological category between persons, and then as an intra-psychological category within the child. All complex cognitive abilities that are internalized in a child were at some point external, i.e. existing as individual functions within a social context between at least two persons. Vygotsky exemplifies this process of internalization by means of a child's joint attention and pointing behaviour. This movement becomes an indicatory gesture first when it is comprehended by surrounding people as an indicator. As Vygotsky (1979) states, "it is through others that we develop into ourselves". This is regardless of the presence of neurobiological deficits, and thus regardless of the level of intellectual functioning.

For typically developing children, Vygotsky (1979) contends that the natural lines of development (i.e. what is neurologically based) converge with the cultural lines of development (i.e. the social conditions for development), so that the internalization process and development of complex cognitive abilities occurs relatively smoothly through social interaction. For children with ID on the other hand, the neurobiological defect reorganises the development of the child as a whole because of incongruence between the neurobiological processes within the child and the social normative processes in the environment of the child. This incongruence derives from society's failure to acknowledge that the structure of the cultural forms and processes in which the child with neurobiological impairments is living is normed for children with typical psychophysical conditions, rather than for children with neurobiological impairments (Bottcher, 2012). When the environment fails to provide the individual with scaffolding to compensate for primary deficits at the correct moments of time, this may result in secondary defects, which again affect the development of the child as a whole. For example, a neurobiological deficit may cause a child to struggle with focusing attention and planning, which in turn may impede the child's ability to perform on-task behaviour to attain a certain goal. Hence, without the necessary supports in the environment, the primary neurobiological deficit may lead to a secondary deficit in the more complex cognitive abilities such as goal attainment. Vygotsky (1993) calls this the process of *disontogenesis*, where the presence of a neurobiological impairment results in deficits in complex cognitive abilities because of social factors. Vygotsky (1979) considers the learning disability that is typically seen in children with ID as a consequence of the incongruence between the biological and cultural lines of development. Thus, Vygotsky (1993) postulates that there exists a dialectic interactive relation between primary neurobiological deficits (e.g. sensory or organic impairments) and new levels of intellectual functioning, such as problem-solving abilities. In this cultural-historical framework, cognition is not exclusively situated in the individual alone, but is also culturally conditioned (Bottcher, 2012). As such, culture and social interaction play a fundamental role in the development of complex cognitive abilities.

For children with ID, active participation in social institutions presupposes that these institutions are adapted to the child's level of functioning. Within an educational context, such adaptations can be obtained when educators use compensatory strategies and scaffolding to address the child's present level of functioning. Scaffolding is the guidance that competent educators provide their students with in order to activate what Vygotsky (1979) called the zone of proximal development (ZPD). The notion of ZPD refers to

the distance between a child's actual level of functioning and its potential level of functioning. The potential level of functioning can be achieved in social interaction with skilled others such as adults or peers with a higher functional level. This interactive and socially constructed learning enhances and accelerates cognitive functioning, and the amount of guidance provided by the skilled other can be gradually decreased as the child becomes more competent. The ulterior purpose of scaffolding is then for the child to become an independent problem solver and self-regulated learner (Dey, Panda, & Banerjee, 2014; Vygotsky, 1979). The ZPD represents the potential intellectual functioning and the wider the ZPD is, the more likely it is that the child's need of scaffolding is matched in the everyday social interaction, thus resulting in the next developmental step. In order to maximize a child's learning, it is essential that pedagogical instruction targets emergent cognitive functions, i.e. the child's learning, rather than to focus on fully formed cognitive functions, i.e. the child's current level of functioning (Dixon, 2016; Kozulin, 2015). The support provided by the tutor should be differentiated accurately in order to meet the particular scaffolding needs to support the child's functioning in interaction with skilled others (i.e. functioning within the ZPD) (Aubrey & Riley, 2016). Information about these particular scaffolding needs can be obtained by observing what is needed for the child to function at a maximum level, i.e. how the child is functioning when optimal and individualized support is provided (Tiekstra, Minnaert, & Hessels, 2016). For example, if a child with ID does not understand a task in school by merely listening to verbal instructions but understands the instruction if the teacher complements the instruction with signs and/or pictures, the child's learning potential can be considered as being able to understand similar verbal instructions in a social context.

Vygotsky's approach does not suggest that the child's cognitive impairment can be completely alleviated when the right pedagogical supports are provided. However, for children with ID, it does imply a shift from focusing on intellectual disability to focusing on intellectual ability. This way, Vygotsky provides a more optimistic view of ID, as several of the cognitive problems encountered by children with ID can be remediated for through his theories of cognitive development and ZPD (Rutland & Campbell, 1996). In current educational practices, a useful domain for Vygotsky's theories may be the promotion of self-determination for individuals with ID, as the development of self-determination can be viewed as the collaboration of several complex cognitive abilities.

### 1.2. Self-determination for individuals with ID

The development of self-determination depends not only on individual characteristics, such as intellectual functioning, but also on environmental influences, as repeated opportunities to engage in self-determined action are essential to the development of causal agency (Shogren, Wehmeyer, & Palmer, 2017). The development of self-determination requires the presence of a number of skills, referred to as component elements of self-determination. These skills include, but are not limited to, identifying and expressing preferences, choice-making, decision-making, goal setting, problem solving, planning, self-management, self-advocacy, self-awareness, and self-knowledge (Palmer, Wehmeyer, & Shogren, 2017). From a Vygotskian perspective, it can be argued that the component elements of self-determination are complex cognitive abilities that appear first as social functions between people before they become internalized within the individual. According to Vygotsky's (1979) theory, the low levels of self-determination that are found in individuals with ID may be a result of incongruence between the neurobiological constitution of these individuals and the social conditions for their cognitive functioning. In children with ID, the foundation of the complex cognitive abilities is limited in the sense that they are dependent on basic neurobiological factors. A Vygotskian perspective on ID and on the use of complex cognitive abilities of self-determination may prove to be a fruitful approach to address existing discrepancies between the biological and cultural lines of cognitive development, in order to optimize the effect of self-determination interventions for individuals with ID.

## 2. Aim of the article

In this article, the following research question is addressed:

*Within a Vygotskian understanding of intellectual disability, how can scaffolding be used to accommodate the specific cognitive needs of students with ID during a self-determination intervention?*

This research question is addressed through experiences from an intervention study with eight adolescents with ID, who used the Self-Determined Learning Model of Instruction over approximately three months under close follow-up from the first researcher. During the intervention, different scaffolding strategies were used.

## 3. Method

### 3.1. The self-determined learning model of instruction

Over the past decades, several instructional models that aim to enhance the self-determination of students with and without disabilities have been developed. One of these instructional models is the Self-Determined Learning Model of Instruction (SDLMI) (Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). This is an evidence-based student-directed instructional model that helps students take greater control over their learning by promoting student involvement in the different phases of the learning process (Wehmeyer et al., 2000). The SDLMI is a versatile model of instruction, which can be used in a variety of educational situations. In the SDLMI, the educator guides the student through the model's three phases, where each phase has four questions. In the first phase of the SDLMI, the student identifies a desired goal to work on. According to Shogren et al. (2015), self-determined people act in service to freely chosen goals, and thus, it is a prerequisite that the student identifies a personally relevant goal in this first phase. In the second phase, the student develops an action plan for how the chosen goal can be achieved, and in the third phase, the student

evaluates goal attainment. The SDLMI is conversation-based, and the questions within each phase provide a framework for the educator to help the student identify what he or she wants to learn, solve problems that stand in the way for goal attainment, and evaluate what has been learned. Even though it is the educator who provides direction to the conversation by following the questions within each phase, the student is the primary agent for the choice of goals and actions. Each phase of the SDLMI also provides educational support for teachers, and throughout the entire process, the teacher plays a central role as facilitator, student advocate and instructor (Wehmeyer et al., 2000).

Research indicates that the SDLMI can help students with ID and learning disabilities to attain self-chosen goals, as well as enhance their self-determination (Shogren et al., 2012; Wehmeyer et al., 2012). A meta-analysis of fifteen single-subject research studies provides evidence for the efficacy of the SDLMI as a way of promoting academic and functional goal attainment for students with diverse disabilities (Lee, Wehmeyer, & Shogren, 2015). Furthermore, when teachers implement the SDLMI with their students with disabilities, this improves teacher perceptions of students' self-determination (Shogren, Plotner, Palmer, Wehmeyer, & Paek, 2014). This indicates that implementing the SDLMI in the classroom not only constitutes an individual intervention targeted at the student level, but that it may also change the students' learning environment. When teachers experience that their students with ID are more capable of performing self-determined behavior, this may encourage teachers to provide their students with more opportunities to perform such behavior, thus resulting in even higher student capacity for self-determination.

Whilst there is ample evidence for the effectiveness of the SDLMI in promoting goal attainment and self-determination for students with disabilities, research indicates that students with ID have lower gains in self-determination scores after interventions with the SDLMI than their peers without ID (Wehmeyer et al., 2012). It is unclear from previous research studies what kind of support and scaffolding has been provided to students with ID when using the SDLMI, and whether and how social interaction between the researcher/educator and participants was used actively to promote the dynamic process of self-determination development.

### 3.2. Participants

In the present study, participants were eight adolescents (age 13–16; two male) with mild ID. Two of the participants had an additional diagnosis of autism spectrum disorder. All of the students showed adequate verbal communication skills, and they experienced few difficulties participating in conversations with the researcher. Students were recruited from two different schools in the south-east of Norway, and all of the students received their education in a segregated special education classroom. Five special educators that had the responsibility for the academic curriculum of the participating students were also involved in the study; they received two lectures on self-determination and the SDLMI before the start of the intervention and there was continuous dialogue between the first researcher and the educators throughout the intervention study. Written parental consent was obtained before the start of the study, as well as oral assent from the students. Parents received individual information letters once a month, to inform about their child's activities and progress in the research project. The researcher checked regularly throughout the intervention whether students wished to continue their participation, which all of them affirmed. The study was approved by the Norwegian Centre for Research Data.

### 3.3. Study design

Participants used the SDLMI for approximately three months. During this time, each student set two to three academic goals, within different school topics such as mathematics, English, and Norwegian. In total, the students worked on 21 self-chosen goals, and the time from identifying a goal to evaluating goal attainment covered about four weeks for each of these goals. During the intervention period, the first researcher visited the students two to three times per week, to supervise the process, to assess student progress, and to assist educators in implementing the SDLMI. In this article, the authors focus on the process of implementing the SDLMI with students with ID, and on the challenges that the students encountered throughout the different phases of the SDLMI. The emphasis lies then on how researchers and educators may support the development of the complex cognitive self-determination skills through appropriate scaffolding.

## 4. Scaffolding of self-determination skills for students with ID

### 4.1. SDLMI phase 1: set a goal

In the first phase of the SDLMI, students define a self-chosen goal that they wish to work on. During the intervention, two main challenges were encountered in this phase, namely difficulties with identifying interests, needs, and strengths in order to formulate a personally relevant goal, and issues with defining a goal that was specific enough so that it could be attained during the course of a couple of weeks. According to Vygotsky (1979), these challenges may relate to poor development of complex cognitive abilities, such as the learning of abstract concepts, e.g. concepts of time. Thus, persons with ID may have the abilities to discriminate between well-known and concrete concepts of time such as the time it takes to walk from home to school, but difficulties with discriminating between the concepts of a month and half a year (Piaget, 2001). Persons with ID may also have difficulties in generalizing somewhat different but related concepts such as “table”, “chair” and “bed” as “furniture” and even more difficulties with conceptualizing abstract concepts such as “idea”, “plan” and “thought” (Tiekstra, Hessels, & Minnaert, 2009). Related to goal setting, these difficulties imply challenges to discriminate and communicate the difference between e.g. wanting something now and having a goal for the next two weeks (Hickson & Khemka, 2013). These difficulties might be a result from an underlying neurobiological impairment, which

may form a weak foundation for higher forms of development. To adapt to impairment in e.g. memory functions or attention, prompting systems such as check lists, pictures learning strategies, and one-on-one instructions by the teacher can be used to enhance learning (Goldstein & Behuniak, 2012; Kim & Hupp, 2007; Rätty, Kontu, & Pirttimaa, 2016). The emerging of complex cognitive abilities may be hampered by social interaction that is not adapted to the child's cognitive functioning. In the current study, students encountered difficulties with expressing interests and formulating short-term goals. This could be an accumulation of neurobiological impairment, limited opportunity for practicing self-determination skills, and a lack of adaptation to the impairment in basic mental functions and adequate scaffolding in previous goal-setting situations. Carefully chosen scaffolding strategies to enhance learning may help students overcome these challenges.

In the present study, the researcher's *use of communication techniques* (Sigstad & Garrels, 2017) helped students identify personally relevant goals based on their own interests, needs, and strengths. Students with ID may face difficulties providing detailed answers to the open-ended questions that each of the phases of the SDLMI consists of. Therefore, communication techniques, such as rephrasing questions, asking more specific follow-up questions, use of active silence to give students time to think, and repeating and summarizing responses may be helpful in the dialogue (Sigstad & Garrels, 2017). These techniques may compensate for any verbal communication difficulties that students with ID have, whilst at the same time safe-guarding the students' autonomy in the process. As Aubrey and Riley (2016) claim, the value of questions within the scaffolding process should not be underestimated.

Another common challenge in this first phase of the SDLMI was students' difficulties with formulating specific short-term goals. Some of the students in the study had clear ambitions as to which goals they wanted to achieve, but their goals were large and not within immediate reach, such as learning how to read, or becoming a nurse. For the purpose of the research project, but also to help students get acquainted with the process of goal setting and goal attainment, smaller goals that could be reached within a couple of weeks were required. Here, *guided goal setting* was helpful to assist the students in setting small and measurable goals. Starting from the student's original long-term goal, the researcher and student investigated the underlying rationale for the goal, e.g. in case of the student who wanted to learn how to read, the ulterior motive was to be able to read text messages from friends. Under the researcher's guidance, the student's original goal could then be reshaped into the smaller goal of memorizing word pictures of 20 words that are frequently used in adolescents' text messages. This goal was heavily rooted in the student's desire to be able to read text messages from friends, whilst at the same time it was transformed into a goal that the student managed to achieve successfully in just a few weeks, thus reinforcing the student's feeling of self-efficacy. Shilts, Horowitz, and Townsend (2004) have described guided goal setting as the practice of presenting students with a pre-set list of possible goals from which they can choose. However, in this study, guided goal setting starts from the students' personal goals, and these goals are then refined into smaller short-term goals. In this way, students' motivation for goal attainment is enhanced as the goal continues to be perceived as personally relevant. This practice may strengthen students' volitional action, an essential characteristic of self-determination, where actions are based on conscious choices that reflect personal interests and preferences (Shogren, Wehmeyer, & Palmer, 2017).

#### 4.2. SDLMI phase 2: take action

In the SDLMI's second phase, students develop an action plan that will help them attain their self-chosen goal. In the present study, this was the phase where students with ID encountered most difficulties. Students had limited insight into which learning strategies would help them attain their goals, difficulties with identifying possible barriers and supports within themselves and their environments, and challenges with understanding concepts of time in order to self-monitor their actions. Planning one's actions in order to attain a certain goal is a complex cognitive ability which, amongst others, requires proficiency in problem solving, decision making, understanding causal relationships, and self-monitoring.

As this phase requires complex cognitive activities, individuals with ID may experience specific difficulties with for example identifying and conceptualizing different barriers and needs of support and, hence, also with getting a sufficiently concrete image of the different outcomes in order to compare and evaluate their options. Due to difficulties with abstract thinking, individuals with ID may also have specific problems with imagining situations, activities and solutions that they have not experienced before. This may be understood as difficulties with making decisions, but frequently, the problem is rather that the person perceives a lack of availability of different choice options (Hickson & Khemka, 2013). For individuals with ID, these difficulties are suggested to be related to limitations in for example working memory, i.e. the quantity of cognitive operation that possibly can be performed at the same time is reduced. If the cognitive level of these operations in addition is at an abstract level, then the working memory span will be even more reduced (Danielsson, Zottarel, Palmqvist, & Lanfranchi, 2015). Working memory is also dependent on the quality of the operations both in the sense of how clear and prominent the information is, and how important the individual perceives the information to be (Ma, Husain, & Bays, 2014). The clearer the contrast between what is important and not important to learn, and the more the information matches individual interests, the better the working memory will function.

The cognitive problems may also be characterized by difficulties with verbal reasoning. These difficulties may affect the development of self-determination, as certain component skills of self-determination, such as decision-making and problem-solving, seem to correlate with verbal reasoning skills (Goharpey, Crewther, & Crewther, 2013). Therefore, it is essential that self-determination interventions provide the necessary scaffolding to students with ID in order to promote the development of complex cognitive abilities despite the students' neurobiological impairments. These proficiencies are not innate abilities, but skills that emerge through social interaction that is adapted to the individual's cognitive functioning. A weaker development of complex cognitive abilities may be a consequence of a discrepancy between the students' neurobiological impairments and the structure of social interactions with the teacher that does not provide adequate support for the students' cognitive disabilities (Böttcher & Dammeyer, 2012).

In the current study, all students were asked to formulate academic goals, and therefore, their action plans needed to include

*learning strategies* that would help them attain these goals. Whilst students frequently answered that they needed to “work a lot” in order to attain their goals, they had limited knowledge of what kind of work was required. As this knowledge was not yet developed in the students, it was important to expose them to different kinds of didactic activities that could help them achieve their goals. It was also important to point out to the students what the possible outcome of each learning strategy could be based on the motivation that they showed for each of the different tasks. For example, for a student who wanted to improve math fact automaticity, several exercises (such as dice games, flashcards, math puzzles, etc.) were introduced to the student. After trying out these different learning activities together with the researcher, the student could choose which of the exercises and strategies to adopt in order to work towards the chosen goal. In this phase, the students were clearly dependent on the expertise of the educator to help them get acquainted with possible training tasks. Providing students with choice as to which type of exercises they can perform in order to attain their goals may be important for the development of both choice making and planning skills. When this is combined with dialogue with the students about which learning processes are taking place, the foundation for the development of complex cognitive abilities, here self-determination skills, is being laid.

In the SDLMI's second phase, students are also asked to identify barriers and supports within themselves and their environments that may either hinder or help them to attain their goals. This requires insight in personal strengths and limitations, as well as an understanding of social constructions around oneself. Such insights may be difficult to attain for any adolescent, and students with ID will need specific guidance in this part of the planning phase. This guidance may be best provided by means of *dialogic teaching*, where educators communicate with students and ask them questions not just to seek right answers, but also to promote the development of reasoning (Mercer & Howe, 2012). The following dialogue with one student who participated in the intervention study illustrates this:

Researcher: *And is there anything that you think could stop you from attaining your goal?*

Student: *No, nothing can stop me. I'm really motivated!*

Researcher: *That is good! Motivation is really good. But if I recall it correctly, you were very motivated for your previous goal as well, but you didn't always find the time to work on that goal.*

Student: *No. But it wasn't my fault. The teacher made me do many other tasks, so I didn't get enough time to work on my goal.*

Researcher: *I see. So that was something that stopped you, that you didn't have enough time. Suppose this happens again with your new goal, what would you do then?*

Student: *Hmm... I would talk with the teacher and say that I need to have enough time to work on my goal.*

Researcher: *That sounds like a good idea. Anything else you think you could do?*

Student: *If the teacher doesn't listen to me, I could go and talk to the principal, maybe...*

By revisiting former experiences and by putting words on these (“*So that was something that stopped you, that you didn't have enough time*”), the researcher helps the student become aware of barriers within the environment that could stand in the way of goal attainment. The researcher does not provide the right answers for the student. Instead, the student is encouraged to identify causal relationships as well as find possible solutions to future challenges by means of dialogue. With this scaffolding, it is likely that the student becomes more skilled at identifying barriers in future goal setting situations.

In the SDLMI's second phase, students are further encouraged to use a *self-monitoring strategy* to assess their efforts that will lead to goal attainment. One example of such self-monitoring is a schedule where students chart the amount of time that they work on their goal for each day of the intervention. Several of the students in the study needed extra support to manage this self-monitoring task. Research has indicated that students with disabilities may develop time processing abilities at a slower pace than their non-disabled peers, and they may experience difficulties with time perception, time orientation, and time management (Janeslätt, Granlund, Kottorp, & Almqvist, 2009). Whilst neurobiological impairments may lie at the basis for these difficulties with the processing of time, adequate scaffolding of self-monitoring in the students' environment may alleviate these problems, so that students will still be able to self-monitor their actions. Technological aids such as computers, tablets and smartphones may provide self-operated prompting systems for this purpose (Räty et al., 2016).

Thus, despite a number of difficulties that the students encountered during this second phase of the SDLMI, these challenges may be compensated for with the right kind of support. This way, students may strengthen their agentic action. Agentic action is one of the essential characteristics of self-determination, which indicates that the individual directs his or her efforts towards a self-chosen goal (Shogren, Wehmeyer, & Palmer, 2017).

#### 4.3. Phase 3: adjust goal or plan

In the SDLMI's third phase, students evaluate whether they have attained their goals, and they make adjustments to their plan or goal if needed. An important aspect of this third phase is that students develop a sense of personal empowerment when they experience that they can attain their goals. When students perceive a link between their actions and the outcomes of these actions, students may develop action-control beliefs, which form another essential characteristic of self-determination (Shogren, Wehmeyer, & Palmer, 2017). With the use of guided goal-setting in the first phase of the SDLMI, goal attainment was within reach for all students in the intervention. However, in order for students with ID to perceive the direct link between their actions and related outcomes, this link needs to be presented in a manner that matches the students' cognitive development. Therefore, students were assessed continuously during a baseline phase before they started working on their goal, and during the intervention phase when they followed their plan towards goal attainment. Their progress was then displayed in a graphic form, so that they could get a *visual presentation* of their improving skills. Through this visualization, it became clear for students that there is a causal relationship between the time and effort that they spent working on their goal and their goal attainment. For the students in the intervention, this resulted in positive



feelings of being proud of their own achievements, a strong sense of empowerment, and a feeling of self-efficacy. This indicates that students with ID are able to develop complex cognitive abilities such as action-control beliefs when the necessary scaffolding is provided, and when information is presented in such a way as to match their natural lines of development. Technological aids that document actions and outcomes can be used for this purpose, and they may also stimulate students to think about future goals and outcomes (Räty et al., 2016).

## 5. Discussion

There is general agreement that self-determination is the result of a person's capacity for self-determination as well as of the opportunities for self-determination that a person encounters in everyday life. However, what constitutes a person's capacity for self-determination? When previous research indicates that individuals with ID have lower levels of self-determination (Garrels & Granlund, 2017), and that they experience lower effects of self-determination interventions than peers without ID (Wehmeyer et al., 2012), this may suggest that it is the individual's neurobiological constitution which causes these differences. Indeed, as Greenspan and Woods (2014) suggest, it can be argued that cognitively mediated deficits such as gullibility, risk-unawareness in everyday life situations, and difficulties in anticipating future consequences are core features of ID, and these reasoning deficits could in turn affect the development of self-determination. Within this approach, capacity for self-determination is likely to be considered a more or less stable trait.

However, from a Vygotskian perspective on cognitive development, poorer outcomes on self-determination measures should not be considered incontrovertible. Self-determination skills such as goal setting, planning, problem solving, and decision making, relate to a person's individual reasoning ability, but this reasoning ability has part of its origin in dialogue with others. Wegerif, Mercer, and Dawes (1996) postulate that the experience of social reasoning can improve individual reasoning, and they consider reason as a form of social practice. This approach indicates that the development of self-determination skills to a large extent may be enhanced if students are supported in practicing these skills together with a tutor. For students with ID, the making explicit of reasoning processes may help create awareness and insight in the different component skills of self-determination, so that students may become more proficient in these skills through practice with others. This way, the individual's capacity for self-determination is no longer a constant. Instead, this approach emphasizes the need for scaffolding in order to promote the development of self-determination skills in individuals with ID, so that there is congruence between the individual's natural and cultural lines of development.

In this study, emphasis has also been placed on the personal goal setting experience of students with ID. Since some students with ID may experience difficulties with identifying attainable goals, it is especially important that the educator provides the required support without dominating the goal setting process. Van der Veen, Smeets, and Derricks (2010) identified students' often problematic attitudes towards school work as one of the main challenges in special education. This may well be related to students' poor autonomous motivation for school tasks. However, when students get the opportunity to take part in their own goal setting, as is the case in interventions with the SDLMI, this encourages learner autonomy and autonomous motivation (Moeller, Theiler, & Wu, 2012). Also, students who get to work on intrinsic academic goals, i.e. goals that they have identified themselves, experience higher levels of school satisfaction, and they become more persistent in their school work (Guay, Ratelle, & Chanal, 2008). Thus, whilst scaffolding is a necessity to help students practice self-determination skills, it is nonetheless important to start the scaffolding process from the students' own interests and motives.

When using the SDLMI, scaffolding can take many forms, depending on the student's strengths and needs. In this study, the use of supportive communication techniques, guided goal setting, exposure to different learning strategies, dialogic teaching, help with self-monitoring strategies, and visual presentations were used to support the students through the different phases of the SDLMI. A common denominator for most of these scaffolding strategies is the use of dialogue with the students, in order to create awareness of the cognitive processes that are happening. As Mercer and Howe (2012) state, when communication between students and tutors is of the right quality, it can be a powerful motor for the development of reasoning. Communication may then fulfill an important educational function, as it may turn learning into a collaborative experience. This may also be effective for the learning of self-determination skills.

## 6. Implications for future research and practice

The SDLMI functions as a framework for the promotion of self-determination, and the model should be supplemented with different educational strategies to address the students' specific needs (Shogren, Wehmeyer, Burke, & Palmer, 2017). From a Vygotskian perspective, these educational strategies need to be aligned with the students' neurobiological constitution, so that there is convergence between the natural and the cultural lines of development. This implies that the educational strategies and the scaffolding that are provided will need to take different forms depending on who is the target of the intervention.

In future research studies that examine the effectiveness of the SDLMI or other self-determination interventions for students with ID, it will be useful to make explicit what kind of scaffolding the participants receive during such interventions. After all, the type of support that the students receive during the different phases of the intervention may influence outcomes dramatically. Increased clarity as to which forms of scaffolding are provided may help educators gain insight in how they can match their students' learning strategies and how they can help them improve their self-determination skills. Large quantitative research studies may not have the appropriate design to investigate this further. Instead, smaller scale studies where researchers and educators can examine the effects of scaffolding closely may provide more knowledge about this.

## 7. Limitations of the study

This article presents a small-scale study with a short intervention period only, with an emphasis on how scaffolding can be used in interventions with the SDLMI. Whilst participants worked successively on their goals over a two to three months intervention period, this may not be sufficient time to infer whether students actually improved their goal setting and other self-determination skills. Students' progress towards goal attainment was closely monitored by the first researcher, and all students attained their self-chosen goals. However, more research is needed over a longer course of time to determine whether appropriate scaffolding enhances students' goal-setting and other self-determination skills.

## 8. Conclusion

This study used a Vygotskian perspective to look into the development of self-determination for students with ID. Within this approach, the lower levels of self-determination that are found in individuals with ID, as well as the lower effects of intervention studies to enhance their self-determination, may be explained by a discrepancy between the individual's natural and cultural lines of development. This indicates the need for appropriate scaffolding. In this study, eight adolescents used the Self-Determined Learning Model of Instruction over a three-month period, during which they set and attained academic goals. During the different phases of the intervention model, the students were provided with different forms of scaffolding, such as guided goal setting, use of supportive communication techniques, and dialogic teaching, in order to help them enhance their self-determination skills. This approach may broaden our understanding of what 'capacity for self-determination' means for students with ID, as this no longer is considered a fixed trait within the individual, but rather a consequence of social interaction with the environment.

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## Competing interests statement

The authors have no competing interests to declare.

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# Attachment 4

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# Student-directed learning: A catalyst for academic achievement and self-determination for students with intellectual disability

**Veerle Garrels**   
University of Oslo, Norway

**Susan B. Palmer**  
University of Kansas, USA

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## Abstract

In this single-case experimental design study, eight adolescents with mild intellectual disability (ID) participated in a 3-month intervention with the Self-Determined Learning Model of Instruction. Findings indicate that student-directed learning may enable students with ID to increase their academic achievements, and the authors explore how this may lead to enhanced self-determination over time. Further data analysis suggests that student-directed learning first of all may have an impact at the level of the environment, such that teachers start to perceive their students with ID as capable agents who can take an active role in their own learning process. This change in teacher perception may lead to students getting more opportunities to practice and refine self-determination skills, which in turn may lead to increased capacity for self-determination. Findings from this study are uplifting, as even brief student-directed learning interventions may trigger positive effects on students' self-determination.

## Keywords

academic achievement, intellectual disability, SDLMI, self-determination, student-directed learning

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## Corresponding author:

Veerle Garrels, Department of Special Needs Education, Faculty of Educational Science, University of Oslo, Universitetet i Oslo, Institutt for Spesialpedagogikk c/o Veerle Garrels, Postboks 1140 Blindern, 0318 Oslo, Norway.

Email: [veerle.garrels@isp.uio.no](mailto:veerle.garrels@isp.uio.no)

## **Introduction**

This study aims to investigate how student-directed learning may influence academic achievement and the development of self-determination for students with mild intellectual disability (ID). According to ICD-11, mild ID is “a condition originating during the developmental period characterized by significantly below average intellectual functioning and adaptive behaviour that are approximately two to three standard deviations below the mean.” Individuals with this condition will generally be able to master self-care, independent living, and employment (WHO, 2018). Below average intellectual functioning suggests that individuals with mild ID may struggle with the ability to reason, plan, and solve problems (Luckasson and Schalock, 2013), but it may be questioned whether these abilities are constant traits within the individual or whether they are skills that can be practiced and refined. A self-determination approach supports the latter view and may thus provide a fruitful advance in educational practices for students with mild ID.

Self-determination refers to self-caused action, indicating that self-determined people act volitionally toward self-chosen goals (Wehmeyer et al., 2017). Because of its positive correlations with desirable post-school outcomes such as independent living (Shogren and Shaw, 2016), employment (Martorell et al., 2008), community participation (Nota et al., 2007), and self-reported quality of life (McDougall et al., 2010), self-determination is considered an important adult outcome for individuals with disabilities. In theory, self-determination is purported to be achieved through a lifelong focus on its development and acquisition; the development of self-determination requires a learning process that begins in early childhood and that continues throughout adulthood (Dunn and Thrall, 2012; Palmer, 2010; Wehmeyer and Palmer, 2000). However, research indicates that individuals with ID may have lower levels of self-determination than their non-disabled peers (Garrels and Granlund, 2018). This may be due, in part, to the restrictive environments in which people with ID frequently tend to live, learn, and work, as such environments may provide fewer opportunities to express preferences, solve problems, make choices and decisions, and learn from mistakes, all of which are central to the development of self-determination (Wehmeyer and Shogren, 2017a).

## **Perspectives on self-determination**

A number of theories of self-determination exist (e.g. Self-Determination Theory, Deci and Ryan (1985); Self-Regulation Theory, Mithaug (1993); Causal Agency Theory, Shogren et al. (2015)). Deci and Ryan (1985) relate self-determination to the concept of motivation, where activities that stimulate the basic psychological needs of autonomy, competence, and relatedness may foster autonomous motivation and self-determination. Mithaug (2003) reminds us that how one views self-determination makes a difference in whether or not we see it as a learning process. For example, self-determination might be seen as only sociopolitical in nature; that everyone wants to be free of undue governance or control (and self-determined). While that may be true, it leaves one to explain how some individuals have the desire and ability to act in the face of different pursuits (e.g. of knowledge, gaining wealth, etc.). This current article is most informed by Causal Agency Theory (Shogren et al., 2015). This theory is a culmination of the work of school-based researchers investigating the link between elements of self-determination such as goal setting and attainment, problem solving, and decision-making in the context of classrooms (Shogren et al., 2015). Causal Agency Theory supports the developmental aspects of self-determination over time, including meeting basic psychological needs of autonomy, competence, and relatedness with motivation to



take causal action toward self-determination. To take causal action, one forms action-control beliefs, assumes volitional action, and becomes a causal agent by taking agentic action. This implies that self-determined people act intentionally in service to freely chosen goals. A question that poses itself here is whether it is possible for students with a disability such as ID to begin to set goals and solve problems without supports. For this, we can look to a functional theory on self-determination—a precursor to Causal Agency Theory (Wehmeyer, 1999). As does Mithaug (2003), Wehmeyer sees a critical need to look at not only ability but also at the opportunity to practice and put self-determination skills into use as many times as possible. When a student is less able or less motivated to be a causal agent, adults (teachers and family members) need to provide accommodations and supports to scaffold the development of self-determination for future success. Within the functional theory, Wehmeyer (1999) identifies different component elements that are particularly important to the emergence of self-determined behavior, such as choice-making, decision-making, problem-solving, goal-setting and attainment, self-evaluation, self-advocacy, and self-knowledge.

Self-determination can also be interpreted as an ecological theory (Stancliffe and Abery, 2003) built on Bronfenbrenner's ecological model (Bronfenbrenner, 1989). This view supports the previously mentioned Causal Agency Theory in that the competencies that one brings to a situation, the opportunities and control that one has, and environmental supports interact to bring about increased self-determination. Hence, teachers need to consider environment as a support for self-determination development. Environment in a broader sense is not only the place where learning happens but also involves the people and material supports that bring about causal agency and self-determination. Some settings encourage the development of self-determination with naturally occurring opportunities to practice and refine self-determination skills. For students with ID, adequate support and accommodations that stimulate the learning process toward self-determination are paramount.

Educators may sometimes experience the need to help students achieve academic goals in line with the general curriculum and the need to provide them with instruction for other educational needs, such as the development of self-determination, as competing demands (Dunn and Thrall, 2012). However, these demands do not necessarily contradict each other, as instruction in self-determination can function both as a means and as an end in this situation. Zheng et al. (2014) found a strong positive correlation between self-determination and academic achievement and postulate that students who act as their own primary causal agent (i.e. who behave in a self-determined fashion) are able to set and attain academic goals. Erickson et al. (2015) found similar evidence for a strong correlation between self-determination and academic achievement for students with ID. So far there is limited evidence for the directionality of this correlation, but teachers and families who support student involvement in education (and in community activities) may be taking critical steps toward helping students to become more self-determined and be able to achieve a self-selected quality of life (Palmer, 2010).

Student-directed learning strategies, where students identify learning goals and develop action plans for goal attainment, may be a fruitful way of addressing complex educational demands, as such strategies may stimulate both academic achievement and self-determination. Rather than seeing the learning process as being primarily intrinsically motivated (Deci and Ryan, 1985) or dependent upon teacher reinforcement (Skinner, 1971), student-directed learning or student involvement in learning appears to be in a reciprocal relationship with educational planning to promote self-determination (Wehmeyer and Shogren, 2017b). It is then of interest to investigate this reciprocity further. To shed more light on how student-directed learning might contribute to

enhanced academic achievement and self-determination for students with mild ID, this article looks closer into an intervention study with the Self-Determined Learning Model of Instruction (SDLMI) (Wehmeyer et al., 2000).

### *The self-determined learning model of instruction*

The SDLMI is an evidence-based instructional model, designed for teachers to enable students with and without disabilities to become self-directed and self-regulated learners. The SDLMI supports student-directed learning by providing educators with an instructional tool to engage students in the entire learning process. With the SDLMI, students are invited not only to participate but to take an active lead in their learning process, as they are encouraged to work on personally relevant goals within the parameters of the school context and to develop action plans to attain these self-chosen goals (Wehmeyer et al., 2000). The SDLMI consists of three phases: (1) set a goal, (2) develop an action plan, and (3) adjust the plan or goal. For each phase, the student is guided through four problem-solving questions: (a) identify the problem, (b) identify possible solutions to the problem, (c) identify potential barriers, and (d) identify consequences of each solution. Within the model, a set of teacher objectives is imbedded to provide a road map for teachers as to specific outcomes for each phase, such as identifying preferences and needs, identifying goal attainment criteria, and so on. Teachers select outcomes to meet student needs within the learning context. In addition, a list of educational supports delivers suggestions as to how the student can be supported while working through the different phases, for example, by means of antecedent cue regulation or choice-making instruction. The SDLMI is a conversation-based instructional model, and while it promotes student-directed learning, the teacher plays a pivotal role as facilitator and instructor (Shogren et al., 2017b; Wehmeyer et al., 2000). Because the model requires students to engage in conversations about their own learning processes, students need to have relatively adequate communicative abilities. This makes the model more fit for use with students with mild ID, rather than with those with more severe cognitive disabilities.

The SDLMI has been used in several randomized control trials (RCT), quasi-experimental design studies, and single-case experimental design studies. In a large-scale RCT study (Wehmeyer et al., 2013) with 371 students with a learning disability or ID students' self-determination was assessed with two different measures on self-determination, namely American Institutes for Research (AIR) Self-Determination Scale, which assesses capacity and opportunity for self-determination (Wolman et al., 1994), and the ARC Self-Determination Scale, which assesses the essential characteristics of self-determination as presented in the Functional Theory of self-determination, that is, autonomy, self-regulation, psychological empowerment, and self-realization (Wehmeyer and Kelchner, 1995). For both instruments, the student self-report was used. After a 3-year intervention with the SDLMI, students showed significant increases in self-determination as measured by the AIR Self-Determination Scale. However, this study found no significant changes on the ARC Self-Determination Scale. While an intervention with the SDLMI provides systematic opportunities to practice self-determination skills and therefore may lead to increased self-determination scores on the AIR Self-Determination Scale, bringing about actual changes in the essential characteristics of self-determined behavior may be more complicated. Yet, Wehmeyer et al. (2012) did find significant increases in students' self-reported self-determination as measured by both the AIR Self-Determination Scale and the ARC's Self-Determination Scale in an RCT study where 312 students with ID or learning disability participated in a 1-year

intervention with the SDLMI. Based on the same study, Shogren et al. (2014) found that the SDLMI intervention resulted in significant increases in how educators perceive student capacity and opportunity for self-determination as measured by the AIR Self-Determination Scale teacher report. A recent RCT study by Shogren et al. (2018) which involved 340 students with ID further found significant increases in self-reported self-determination scores after a 1-year intervention with the SDLMI. Here, self-determination scores were assessed with a new measure of self-determination, namely the Self-Determination Inventory: Student-Report (Shogren et al., 2017c). This measure is based on Causal Agency Theory and assesses the essential characteristics of volitional action, agentic action, and action-control beliefs. Thus, despite several studies indicating a positive change in self-determination after interventions with the SDLMI, findings are not completely consistent, and results may depend on how researchers understand and measure the self-determination construct and also on who performs the rating, that is, whether students or teachers assess student self-determination.

Other studies have looked into how interventions with the SDLMI may affect students' academic goal attainment and access to the general curriculum, including students' problem-solving skills, active classroom participation skills, self-regulated learning strategies, academic achievements, and reducing disruptive behaviors in general education classrooms. A meta-analysis conducted by Lee et al. (2015) indicated that interventions with the SDLMI may lead to increased access to the general curriculum for students with disabilities. Research provides additional evidence that the SDLMI is an effective intervention for goal attainment for students across grade levels and disability categories (Kleinert et al., 2014). According to the previously mentioned study by Shogren et al. (2018), teachers saw students' goal attainment (as measured by Goal Attainment Scaling (Kiresuk et al., 1994)) during a 1-year intervention with the SDLMI as a predictor for students' self-determination levels. Thus, there may be evidence for a correlation between student-directed learning, goal attainment, and self-determination, and both teachers and students seem to acknowledge this relationship.

## **Purpose of the study**

Previous research results indicate a strong correlation between academic achievement and self-determination, and there exists a body of evidence for the effect of the SDLMI on student self-determination. Student-directed learning may then be a pivotal factor that can enhance both academic achievement and self-determination. Yet, despite several larger studies on how the SDLMI may affect student self-determination, there is a paucity of evidence about how student-directed learning may lead to enhanced academic achievement and self-determination for students with ID. Long-term RCT studies have offered useful information about the effect of student-directed learning on academic goal attainment and student-directed learning (i.e. a question of *how much*), while a short-term study may provide insight in *how* those changes occur. In particular, expanding the knowledge base with information about how self-determination may develop through student-directed learning may provide a useful contribution to the field, as self-determination has been identified as a key outcome for students with disabilities. In this study, researchers aim to look into how students with mild ID improve their academic achievement and self-determination over a 3-month goal-setting intervention with the SDLMI. Changes in academic achievement and self-determination are then analyzed in light of existing theory on self-determination, as presented earlier in this article.

## Method

### *Participants*

In this study, eight adolescents (aged 13–16; six girls and two boys) with mild ID participated. Two of the participants had an additional diagnosis of autism spectrum disorder (ASD), and, according to teacher reports, one of the participants was in the lower range of mild ID, that is, closer to moderate ID. All participants had adequate verbal and communicative skills. Participants were recruited from two schools in two different municipalities in Eastern Norway. The instructional environment for six of the students was a separate special school, while the remaining two students received their education in a segregated classroom in their local school. These different school settings are not considered indicative of specific characteristics within the participants, but rather reflect local differences as to how Norwegian communities organize their special education for students with ID. The students' special educators ( $N = 5$ ; 4 females) also participated in the study.

### *Procedure*

This study used a single case experimental design with multiple baselines to assess students' goal attainment. Criteria for evidence-based standards for single-case experimental designs were followed (Kratochwill et al., 2010). These criteria include (1) systematic manipulation of an independent variable (here, the SDLMI), (2) assessment by more than one assessor in at least 20% of the data points in baseline and intervention phase, (3) at least three attempts to demonstrate the effect, and (4) a minimum of three data points in each phase.

Additionally, students' self-determination was assessed with the AIR-S-NOR and AIR-E-NOR, the Norwegian version of the student and teacher report of the AIR Self-Determination Scale (Garrels and Granlund, 2018) before and after the intervention. Before the start of the study, all educators received instructions on how to implement the SDLMI, and the first researcher provided continuous assistance to the educators throughout the intervention period, which lasted approximately 3 months. During the study, the students used the SDLMI to set two to three personally relevant academic goals (reading skills, mathematics, English, etc.) that they worked on consecutively. Students received the necessary support from the first researcher and their educators to identify and define short-term learning goals that could be attained within a couple of weeks and to develop action plans that could lead to goal attainment.

As students were encouraged to choose two to three personally relevant goals during the intervention period, not all goals could readily be assessed by means of continuous measures (e.g. "improving symmetrical drawing skills"). Still, students were supported to work on their goals of preference, even though this meant that there was no continuous data collected for each of their goals. In this article, one goal with continuous measurement is presented for each of the students, that is, a total of eight goals. Students 1–4 selected goals within math fact automaticity, as they identified that they struggled with some of these basic skills. Student 1 wished to get better at addition with numbers 0–15; student 2 wanted to improve addition skills with numbers 0–10; students 3 and 4 chose subtraction with numbers 0–10. Student 5 chose a goal of learning how to say numbers and greetings in Spanish because of annual travels to Spain with the family; student 6 wanted to learn numbers 0–50 in English because of contact with an English-speaking friend; student 7 chose a goal of learning to sight read 20 words that are frequently used in text messages to be able to read text messages from friends. Student 8 wanted to get better at reading difficult words to increase her experience of flow while reading books.

## *Instruments*

To evaluate student progress toward goal attainment, the first researcher developed continuous measures in the form of frequency counts, discrete trials/percentage of correct performance, or duration. For example, for a student who wanted to improve math fact automaticity skills, the continuous measure assessed how much time was spent per correct exercise. Student progress was assessed two to three times per week throughout the intervention. Students were shown visual presentations (graphs) of their assessed performance throughout the intervention phase.

To ensure the validity of the continuous measurements, a research assistant not otherwise involved in the study assessed student progress during 26% of the data points of the baseline and intervention phases. Interobserver agreement was assessed with a Pearson's product-moment correlation, which was calculated to be 0.997, that is, very high agreement. Pearson's product-moment correlation does not provide a fine-grained agreement measure of the point-by-point agreement of the assessments, but due to the different continuous measures that were used for the different goals, this was considered a viable solution.

Student level of self-determination was assessed prior to intervention start and again after the 3-month intervention, using the AIR-S-NOR and AIR-E-NOR. The AIR-S-NOR is the Norwegian student form of the AIR's Self-Determination Scale (Wolman et al., 1994). This measure was adapted and validated for use in Norway by Garrels and Granlund (2018), and the psychometric properties of the Norwegian version are comparable to the properties of the original version, that is, good to excellent. The AIR-S-NOR consists of two subscales—capacity and opportunity for self-determination. The capacity subscale consists of two indexes, namely “Things I do” and “How I feel,” which assess students' self-determined behavior and their perceptions when performing these behaviors. The opportunity subscale measures student perceptions of opportunities to perform self-determined behaviors at school. The instrument has a total of 21 items rated on a four-point Likert-type scale (Garrels and Granlund, 2018). These items on the scale assess several component elements of self-determination, such as a person's ability to identify strengths and needs, to set goals, and to develop and adjust plans to attain those goals (Shogren et al., 2017a). In this study, the first researcher performed individual interviews with each student to assist them with the self-report. Visual aid was provided during these interviews to support the students' understanding of the questionnaire items.

The AIR-E-NOR is the Norwegian version of the AIR Self-Determination Scale educator form. The AIR-E-NOR has a similar construction as the AIR-S-NOR, as it also consists of a capacity subscale (with indexes for knowledge, ability, and perception) and an opportunity subscale (with an index for opportunities at school). The total AIR-E-NOR consists of 24 items on a five-point Likert-type scale. The AIR-E-NOR has been tested in focus group interviews with special educators but is not yet validated.

## *Analysis*

To investigate how the intervention with the SDLMI affected students' academic achievements, a visual analysis of the multiple baseline graphs was performed, including analysis of changes in mean across phases, changes in level, changes in trend or slope, and latency of the change (Kazdin, 2011).

The effect of the SDLMI intervention on student self-determination was explored by looking into pretest and posttest data of the AIR-E-NOR and AIR-S-NOR and their respective subscales.

For this analysis, the non-parametric Wilcoxon Signed Rank Test was used, as it is suitable for very small samples (Pallant, 2013). All statistical calculations were performed using SPSS version 25.

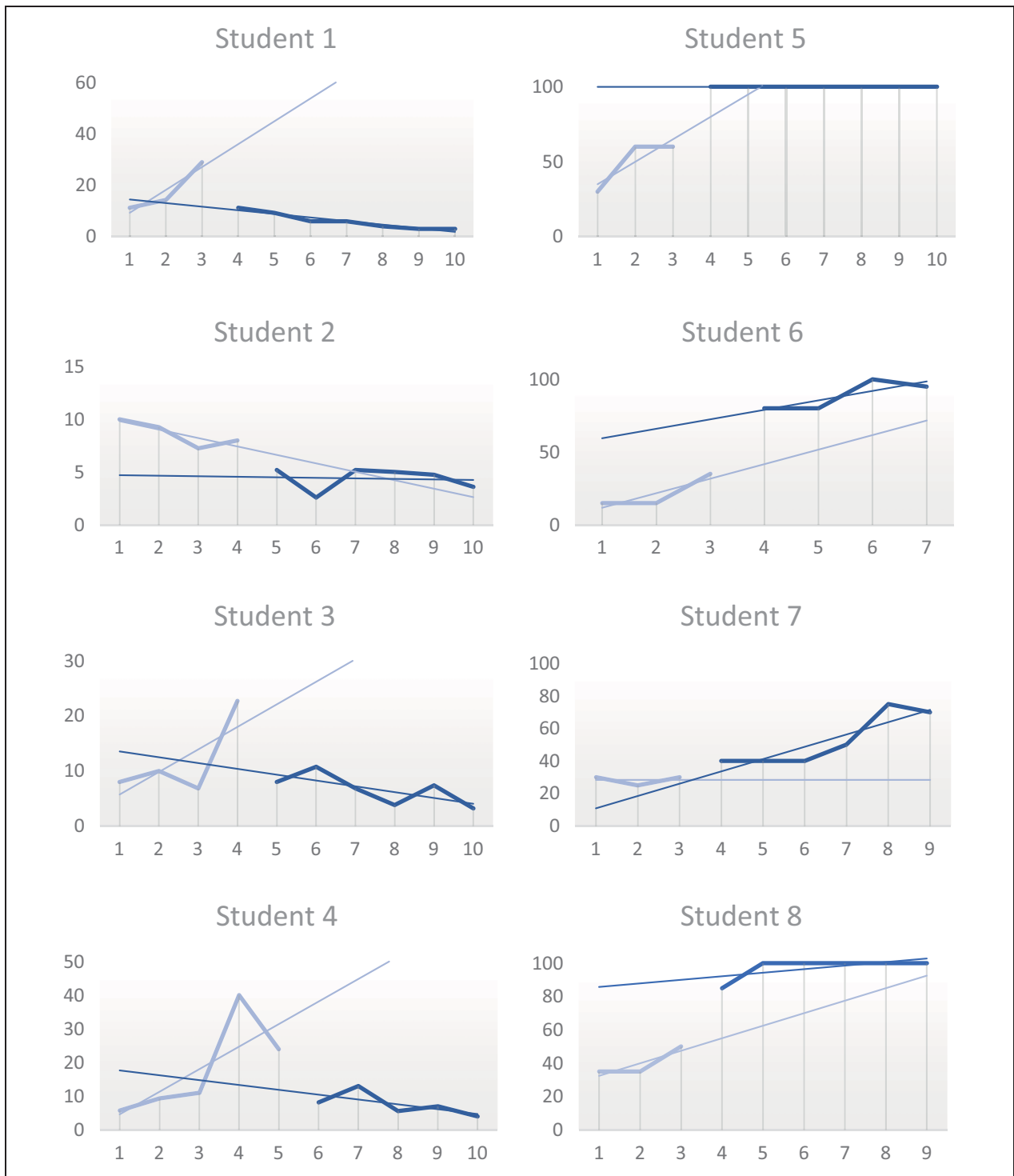
## Ethics

The Norwegian Centre for Research Data approved this study. Parents gave written consent, while students assented orally to participate in the study. To ensure informed consent, students were provided with an information sheet about the study written in “easy Norwegian,” and the voluntary aspect of participating in research was explained specifically. Throughout the 3-month intervention, the first researcher checked regularly whether students continued to be interested in participating in the study, which all of them confirmed.

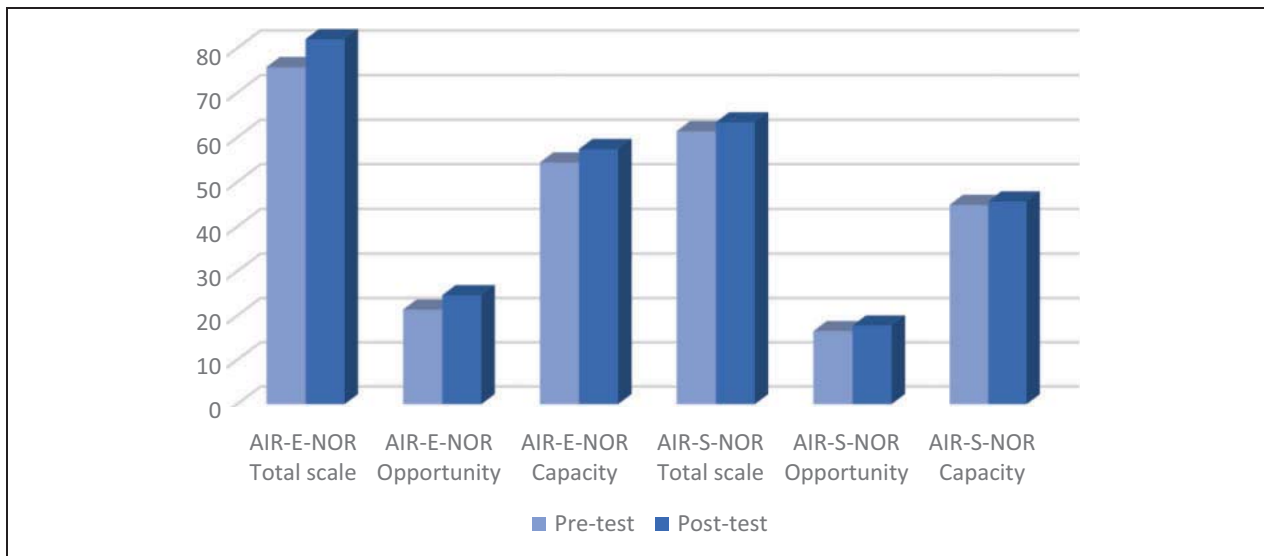
## Results

Visual analysis of the multiple baseline graphs indicate that students improved their academic achievements related to their self-chosen goals during the intervention, and that this improvement could be attributed to instruction with the SDLMI (Figure 1). Students 1–4 decreased their mean scores from baseline to intervention phase, that is, they spent less time per correct exercise after they started working on their action plan, indicating that they increased their math fact automaticity skills. Students 5–8 increased their mean scores from baseline to intervention phase, and this suggests that they increased their percentage of correct performance. An analysis of the trend lines indicates that most of the students experienced a clear change in trend once they started working on their action plan. Students 2 and 8 already showed the desired trend during baseline, which suggests that their goal attainment may have been the result of natural learning or maturation, rather than an effect of the SDLMI intervention. Visual inspection further suggests that all students showed a relatively clear leap in performance between the baseline and intervention phase, again suggesting that the intervention had the desired effect on students’ academic goal attainment. Finally, for all students apart from student 7, the latency between intervention start and change in observed performance is short, which indicates that the SDLMI is the plausible cause of the effect. Thus, a visual inspection of the multiple baseline graphs suggests that students improved their academic performance during the intervention, and that this positive change can be attributed to the intervention with the SDLMI.

Teacher and student perceptions of the students’ levels of self-determination were assessed with AIR-E-NOR and AIR-S-NOR. Figure 2 shows changes in mean between pretest and posttest on AIR-E-NOR and AIR-S-NOR, as well as on the subscales for capacity and opportunity for both instruments. A Wilcoxon Signed Rank Test revealed a statistically significant increase in teacher-rated self-determination scores (AIR-E-NOR) following the intervention with the SDLMI,  $z = -0.992$ ,  $p < 0.046$ , with a large effect size ( $r = 0.498$ ). The median score on the AIR-E-NOR increased from pre-intervention (Md = 76.5) to post-intervention (Md = 81.5). A further investigation of the subscales of the AIR-E-NOR showed a significant increase on the opportunity subscale,  $z = -2.392$ ,  $p = 0.017$ , with a large effect size ( $r = 0.598$ ). The median score on the teacher reported opportunity subscale improved from pretest (Md = 21.5) to posttest (Md = 25). On the capacity subscale, no statistically significant increase was found,  $z = -1.253$ ,  $p = 0.206$ , but the median score on the capacity subscale did show a slight improvement from pretest (Md = 55) to posttest (Md = 57).



**Figure 1.** Multiple baseline graphs for goal attainment, with trend lines for baseline and intervention phases. Goal attainment for students 1–4 is measured in number of seconds spent per exercise (expect decrease during intervention phase). Goal attainment for students 5–8 is measured in percentage of correct performance (expect increase during intervention phase).



**Figure 2.** Mean pretest and posttest scores on AIR-E-NOR and AIR-S-NOR. AIR: American Institutes for Research; AIR-S-NOR and AIR-E-NOR: Norwegian version of student and teacher report of AIR's Self-Determination Scale.

Student perception of self-determination before and after the SDLMI intervention was assessed with the AIR-S-NOR. A Wilcoxon Signed Rank Test revealed no statistically significant increase in student-rated self-determination scores following the intervention with the SDLMI,  $z = -0.339$ ,  $p = 0.734$ . The median score on the AIR-S-NOR increased only slightly from pre-intervention ( $Md = 61$ ) to post-intervention ( $Md = 62.5$ ). A separate analysis of the capacity and opportunity subscales of the AIR-S-NOR showed no statistically significant change.

## Discussion

Data from this study show that even a short-term intervention of 3 months with the SDLMI may influence both students' academic goal attainment and opportunities for self-determination in a positive way. A visual analysis of the multiple baseline data indicates that students had significant gains in their academic goal attainment, suggesting that student-directed learning may have an immediate impact on students' academic achievements. This indicates that the SDLMI, with its emphasis on guiding teachers to facilitate students to set personally relevant goals within a school setting, may function as a catalyst for goal attainment. This finding is supported by previous research on goal attainment, which suggests that when students get to work on self-chosen goals, they become more persistent in working toward these goals, reach higher levels of self-efficacy, and experience enhanced academic engagement and time on task behavior (Furtak and Kunter, 2012; Guay et al., 2008; Moeller et al., 2012; Stevenson, 2016). These benefits of setting personally relevant goals may contribute to the likelihood of goal attainment. Thus, implementing the SDLMI for students with ID may function as a motivational trigger for academic goal attainment. This interpretation taps into certain aspects of different theories on self-determination. On the one hand, when students get to choose their own academic goals, this may stimulate the development of volitional action. According to Causal Agency Theory (Shogren et al., 2017d), volitional action is based on conscious choices that reflect individual preferences, and its development is stimulated when students are given the opportunity to explore their own strengths, needs, and interests, as is



the case when defining personally relevant goals. On the other hand, student-directed learning acknowledges the student as a competent learner, capable of taking an active role in his or her learning process. According to Self-Determination Theory (Deci and Ryan, 1985), this acknowledgement may fulfill the student's basic psychological needs for autonomy and competence, which underlie self-determined actions. For students with ID who may traditionally be met with low expectations regarding their academic progress, student-directed learning implies a change in how educators view their students' potential. With the right support, student-directed learning allows students with ID to play a lead role in their own learning process, as they become actively involved and included in their own education. They are being credited with causal agency, which may fulfill their basic psychological needs for autonomy, competence, and relatedness, and consequently, enhance their self-determination.

While the effects of student-directed learning on academic goal attainment seem to occur within a relatively short time span, the impact on students' self-determination may not be as immediate. Findings from the current study indicate that a 3-month intervention with the SDLMI may lead to an improvement in how teachers rate their students' overall self-determination, and, more specifically, teachers experience that the SDLMI provides their students with more opportunities to practice self-determined behavior. Along the principles of ecological theory of self-determination (Stancliffe and Abery, 2003) and functional theory of self-determination (Wehmeyer, 1999), student-directed learning may imply a modification of the learning environment for students with ID, that is, the initial change occurs within the teacher who acknowledges the student with ID as a capable agent who can be provided with opportunities to self-direct his or her learning process. With the SDLMI, students receive support for their self-determination development, as they are provided with opportunities to practice and refine component elements of self-determination, such as identifying strengths and needs, setting goals, making plans, and self-monitoring. According to Causal Agency Theory (Shogren et al., 2017d), such "self-determination-friendly" learning environments may help students become more confident in and capable of performing self-determined behavior. Thus, when teachers alter their educational practice toward more student involvement, this may also change how they perceive their students, which in turn may affect students' perception of themselves as active agents in their own learning process.

While teachers found that students got increased opportunity to practice self-determined behavior, students' capacity to perform self-determined behaviors did not seem to improve as quickly, according to teacher reports. This may indicate that, while the SDLMI may provide more opportunity to practice self-determined behavior, students' ability to act in a self-determined manner may require more time to improve. This is in line with Causal Agency Theory (Shogren et al., 2015), which emphasizes the developmental aspects of self-determination and the need for a continuous practicing and refining of self-determination skills, that is, students require educational environments that can provide sustainable opportunities to practice self-determined behavior to become proficient in this type of behavior. Thus, for students with ID, providing more opportunities to perform self-determined behavior may be an important first step toward improving their overall self-determination. An increased capacity for self-determined behavior may spring from the provision of more opportunities to perform such behavior. However, research suggests that many Norwegian students with and without ID do not experience that they learn different self-determination skills, such as goal setting and planning, at school (Garrels, 2017). This finding highlights the need for instructional models that address this need and that are easy to implement. The SDLMI may then be a useful tool for teachers who wish to provide more of these opportunities in their teaching activities.

In this study, researchers did not find a significant difference in how students rated their own self-determination before and after the intervention. One possible explanation is that a 3-month intervention is not sufficient for students to experience change in something as complex as their own self-determination, that is, it may take longer time and more exposure before students start to alter the perception of themselves as causal agents. Even though all students attained their self-chosen academic goals, these achievements may not automatically have translated into the metacognitive awareness that they also enhanced their goal setting skills and other skills related to self-determined behavior. Thus, while students may have improved a number of self-determination skills, they may not yet experience themselves as more self-determined individuals. This explanation finds support in Causal Agency Theory (Shogren et al., 2015), which defines self-determination as a “dispositional characteristic,” that is, self-determination may be understood as the individual’s tendency to behave in a certain way, rather than as the individual’s ability to perform certain self-determination skills. Changing the way one views oneself is then a more complex process, which is likely to require longer time.

Another possible explanation for the lack of change on the student reports may be found in the implementation of the research study. Even though educators were active participants in the study, the implementation was primarily led by the researcher. It is then possible that students did not experience instruction with the SDLMI as part of their regular classroom activities. This may explain why they did not report changes in their opportunities to practice self-determination skills at school, despite the factual increase in opportunities that the intervention with the SDLMI provided.

## **Conclusion**

In this study, eight adolescents with ID participated in a 3-month intervention with the SDLMI, where they set and attained personally relevant academic goals. Goal attainment was evaluated by means of individualized continuous measures, and visual analysis of the multiple baseline graphs indicates that students increased their academic performance when using the SDLMI. Student self-determination was assessed pre- and post-intervention by means of the AIR-E-NOR (teacher report) and AIR-S-NOR (student self-report). At post-intervention, a significant increase in student self-determination was found on the AIR-E-NOR, but not on the AIR-S-NOR.

Findings from this study suggest that student-directed learning may enhance academic achievement, as students become actively engaged and included in their own learning process. Results from the study also indicate that the SDLMI may offer teachers an instructional tool that can provide their students with more opportunities to practice self-determined behavior, as educators alter educational practice by infusing self-determination into instruction.

While a 3-month intervention with the SDLMI may not be sufficient to change how students perceive themselves as self-determined agents, findings from this study do suggest that even short-term interventions may bring about significant changes in teacher behavior. Intervention data show that the initial change may occur at the environment level, where the foundations for enhanced self-determination can be established. When such environmental changes persist over time, this may lead to enhanced self-determination for students with ID.

## **Implications for future practice and research**

The aim of this article was to investigate the effect of a 3-month intervention with the SDLMI on the academic achievements and self-determination of students with ID and to provide insight into

how student self-determination may develop through student-directed learning. The study contributes with useful information about how and where initial change may occur. However, findings from this small study are preliminary, and it is desirable to replicate this study on a larger scale and with more data collection points, to establish patterns of change and the chronology of self-determination development further.

While this study reports findings from a brief intervention only, results can be considered encouraging for the practical field. Even short interventions with the SDLMI may lead to a more self-determination friendly environment for students with ID. This accommodation of the environment may in turn provide students with more opportunities to practice and refine their self-determination skills.

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### ORCID iD

Veerle Garrels  <https://orcid.org/0000-0002-3237-5371>

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# **Attachment 5**

AIR-S-NOR and AIR-E-NOR





# AIR Selvbestemmelseskala ©

## ELEVSKJEMA – Tilpasset versjon

Elevens navn \_\_\_\_\_ Dato \_\_\_\_\_

Skole \_\_\_\_\_ Klasse \_\_\_\_\_

Fødselsdato \_\_\_\_\_

### HVORDAN FYLLE UT DETTE SKJEMAET

Svar på disse spørsmålene om hvordan du får til det du vil eller trenger. Det kan handle om ting som skjer på skolen, eller etter skoletiden, eller det kan handle om dine venner, eller en jobb eller en hobby som du har.

**Dette er ikke en prøve.** Det finnes ingen riktige eller feile svar. Spørsmålene vil hjelpe deg å lære mer om hva du er flink til og hvor du kanskje trenger hjelp.

**Mål** Kanskje det er noen ord i spørsmålene som du ikke kjenner til. For eksempel blir ordet **mål** brukt ofte. Et mål er noe som du ønsker å få eller oppnå, enten nå eller neste uke eller lengre unna, f.eks. når du blir voksen. Du kan ha mange forskjellige typer mål. Du kan ha mål som har med skolen å gjøre (f.eks. gjøre det bra på en prøve, eller bli ferdig på videregående). Du kan ha et mål om å spare penger for å kunne kjøpe noe (en ny iPad eller nye sko), eller et mål om å bli bedre i idrett (bli med på basketballaget). Alle mennesker har forskjellige mål, fordi alle har forskjellige ting de ønsker eller trenger eller er gode på.

**Plan** Et annet ord som ofte forekommer i noen av spørsmålene er **plan**. En plan er hvordan du bestemmer å oppnå målet ditt, eller det du må gjøre for å få det du vil eller trenger. Du kan ha mange forskjellige planer. Et eksempel på en plan for å bli med på basketballaget kan være: bli flinkere til å kaste ballen i ringen ved å øve oftere etter skolen, spille basketball med venner i helgene, høre på treneren når laget øver, og å se på basketball på TV.

## HVORDAN SVARE PÅ SPØRSMÅLENE

### EKSEMPEL SPØRSMÅL:

Jeg sjekker for feil når jeg er ferdig med en oppgave.

### EKSEMPEL SVAR:

Sett ring rundt nummeret til svaret som matcher best hvordan du er:

(Sett ring rundt **KUN ETT** tall).

**1 Aldri** ..... Jeg sjekker **aldri** for feil.

**2 Sjelden** ..... Jeg sjekker **sjelden** for feil.

**3 Ofte** ..... Jeg sjekker **ofte** for feil.

**4 Alltid** ..... Jeg sjekker **alltid** for feil.

## HUSK

**Det finnes INGEN  
riktige eller feile  
svar.**

Tenk nøye på hvert spørsmål før du setter ring rundt ditt svar.

**VÆR SÅ SNILL Å BESVARE FØLGENDE SPØRSMÅL FØRST:**

Gi et eksempel på et mål som du jobber med.

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Hva gjør du for å oppnå dette målet?

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Hvor bra på vei er du for å oppnå dette målet?

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## AIR Selvbestemmelseskala – Elevskjema (tilpasset versjon)

### TING JEG GJØR

	1	2	3	4
1. Jeg vet hva jeg er god på. <i>Eksempel: Jeg er god til å bake kaker, god til å spille fotball, god til å gjøre lekser, god til å spare penger, god til å gjøre matteoppgaver,...</i>	aldri	sjelden	ofte	alltid
2. Jeg vet hva som er vanskelig for meg. <i>Eksempel: Det er vanskelig for meg å konsentrere meg, lese bøker, trikse med ballen, ...</i>	aldri	sjelden	ofte	alltid
3. Jeg setter mål for hva jeg vil gjøre. <i>Eksempel: Jeg vil bli med på fotballaget, jeg vil spare penger til en iPhone, jeg vil bli flinkere til å skrive på engelsk,...</i>	aldri	sjelden	ofte	alltid
4. Jeg tenker på hva jeg er flink til når jeg setter mål. <i>Eksempel: Jeg er flink til å skåre mål, så derfor vil jeg bli med på fotballaget. Jeg er flink til å lage mat, så jeg velger å lage middag til mamma på hennes bursdag.</i>	aldri	sjelden	ofte	alltid
5. Jeg lager en plan for hvordan jeg kan oppnå mitt mål. <i>Eksempel: Hvis jeg vil lage middag, må jeg finne en oppskrift, jeg må lage handleliste, spørre om penger, gå i butikken, ... Hvis jeg har som mål å bli flinkere til å lese, må jeg lese bok en halv time hver kveld.</i>	aldri	sjelden	ofte	alltid
6. Jeg begynner å jobbe med min plan med en gang. <i>Eksempel: Jeg begynner å sjekke fotballklubber på nett med en gang når jeg har bestemt meg for at jeg vil bli med i en fotballklubb.</i>	aldri	sjelden	ofte	alltid
7. Jeg sjekker om jeg gjør det bra når jeg jobber med min plan. <i>Eksempel: Hvis jeg sparer penger til noe, teller jeg regelmessig hvor mye penger jeg har fått og hvor mye mer jeg må spare. Jeg spør læreren min eller pappa om jeg gjør matteoppgavene riktig.</i>	aldri	sjelden	ofte	alltid
8. Hvis planen min ikke fungerer, prøver jeg en annen plan for å oppnå målet mitt. <i>Eksempel: Hvis jeg ikke får nok penger til iPhone ved å spare lommepenger, må jeg kanskje gjøre noen småjobber som jeg kan få penger for.</i>	aldri	sjelden	ofte	alltid

## HVORDAN JEG FØLER MEG

	1	2	3	4
<p>1. Jeg er fornøyd med hva jeg liker og hva jeg vil.</p> <p><i>Eksempel: Jeg synes det er bra at jeg er glad i fotball. Jeg synes det er bra at jeg liker å gå på skolen. Jeg synes det er bra at jeg vil bli flinkere til å gå på ski. Jeg synes det er bra at jeg vil bli bedre i engelsk.</i></p>	aldri	sjelden	ofte	alltid
<p>2. Jeg synes det er greit at noen ting er vanskelig for meg.</p> <p><i>Eksempel: Jeg synes det er greit at jeg må jobbe mer med matte. Jeg synes det er greit at jeg må øve mer på engelske gloser.</i></p>	aldri	sjelden	ofte	alltid
<p>3. Jeg har tro på at jeg kan sette mål for det jeg vil.</p> <p><i>Eksempel: Hvis jeg ønsker å bli med i gymklubben, så tror jeg at jeg kan få det til. Hvis jeg ønsker å bli flinkere til å skrive, så kan jeg klare det.</i></p>	aldri	sjelden	ofte	alltid
<p>4. Jeg liker å lage planer for å oppnå mine mål.</p> <p><i>Eksempel: Hvis jeg vil treffe flere venner etter skoletid, liker jeg å finne ut hvilke aktiviteter vi kan gjøre sammen.</i></p>	aldri	sjelden	ofte	alltid
<p>5. Jeg liker å begynne å jobbe med planene mine med en gang.</p> <p><i>Eksempel: Når jeg har bestemt meg for å bli flinkere i matematikk, begynner jeg å jobbe med ekstra lekser med en gang.</i></p>	aldri	sjelden	ofte	alltid
<p>6. Jeg liker å sjekke om jeg er på vei til å oppnå mine mål.</p> <p><i>Eksempel: Jeg synes det er gøy å spørre læreren om jeg har blitt bedre til å skrive. Jeg synes det er fint å regne ut hvor mye mer penger jeg trenger for å kjøpe en ny fotball.</i></p>	aldri	sjelden	ofte	alltid
<p>7. Jeg prøver gjerne andre måter hvis det hjelper meg å oppnå mine mål.</p> <p><i>Eksempel: Jeg blir ikke veldig lei meg når den første planen min ikke fungerer, men lager heller en ny plan for å få det jeg vil. Hvis jeg f.eks. har øvd mye alene på å trikse med ball uten å bli bedre, så kan jeg spørre en som er flink til å trikse til å lære meg det.</i></p>	aldri	sjelden	ofte	alltid

## DET SOM SKJER PÅ SKOLEN

	1	2	3	4
<p>1. De voksne på skolen lytter til meg når jeg snakker om hva jeg ønsker.</p> <p><i>Eksempel: Når jeg forteller at jeg har lyst å lære å spille et nytt dataspill, så hører læreren på meg. Når jeg sier at jeg ønsker å bli bedre på engelsk, lytter de voksne til meg.</i></p>	aldri	sjelden	ofte	alltid
<p>2. De voksne på skolen forteller meg at jeg kan sette mål for det jeg vil gjøre.</p> <p><i>Eksempel: Når jeg sier at jeg har lyst å lære å spille gitar, sier læreren at jeg kan klare det. Læreren min tror på at jeg kan klare å bli med i en løpekonkurranse.</i></p>	aldri	sjelden	ofte	alltid
<p>3. På skolen har jeg lært hvordan jeg lager planer for å oppnå mine mål.</p> <p><i>Eksempel: Læreren min hjelper meg å lage en plan for hvordan jeg kan bli bedre til å skrive stil. Læreren min hjelper meg til å finne ut hvordan jeg kan lære å ta bussen til byen.</i></p>	aldri	sjelden	ofte	alltid
<p>4. De voksne på skolen oppmuntret meg til å begynne å jobbe med planene mine med en gang.</p> <p><i>Eksempel: Når jeg vil overraske mamma med middag til morsdag, sier læreren at jeg kan finne en matoppskrift med en gang.</i></p>	aldri	sjelden	ofte	alltid
<p>5. Jeg har noen på skolen som kan fortelle meg om jeg oppnår mine mål.</p> <p><i>Eksempel: Læreren min sier at jeg har blitt mye flinkere allerede på å lese, og at jeg må fortsette å lese bøker på kvelden.</i></p>	aldri	sjelden	ofte	alltid
<p>6. De voksne på skolen gir meg råd når jeg må endre planen min for å oppnå mine mål.</p> <p><i>Eksempel: Når jeg har lest en halv time hver kveld uten å bli flinkere til å lese, sier læreren at jeg kanskje må lese enda mer hver dag, eller at jeg må lese enklere bøker eller øve på å lese ordlister i stedet.</i></p>	aldri	sjelden	ofte	alltid

# AIR Selvbestemmelseskala ©

## LÆRERSKJEMA

Elevens navn \_\_\_\_\_ Dato \_\_\_\_\_

Elevens fødselsdato (eller alder) \_\_\_\_\_ Klasse \_\_\_\_\_

Lærerens navn \_\_\_\_\_

Skole \_\_\_\_\_

### HVORDAN FYLLE UT DETTE SKJEMAET

Hver side i dette skjemaet handler om egenskaper og atferd som indikerer i hvilken grad din elev viser selvbestemmende atferd og i hvilken grad personer rundt din elev legger til rette for muligheter til å utfolde selvbestemmelse. Velg riktig svaralternativ for hvert spørsmål ut i fra hva du har observert rundt din elev. Hver egenskap er beskrevet med et eksempel. Skriv gjerne ned et eget eksempel for å begrunne ditt svaralternativ.

Her følger et eksempel for hvordan spørsmålene besvares riktig.

#### SPØRSMÅLEKSEMPEL:

Eleven sjekker for feil når en oppgave er fullført.

#### SVAREKSEMPEL:

Kryss av for svaret som best beskriver din elev:

(Kryss av for KUN ETT svar per spørsmål).

1 Aldri ..... eleven sjekker aldri for feil.

2 Nesten aldri ..... eleven sjekker nesten aldri for feil.

3 Noen ganger ..... eleven sjekker noen ganger for feil.

4 Nesten alltid ..... eleven sjekker nesten alltid for feil.

5 Alltid ..... eleven sjekker alltid for feil.

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## KUNNSKAP om selvbestemmende atferd

<p><b>1. Eleven kjenner til egne evner og begrensninger.</b>  <i>Eksempel:</i> Ole kan identifisere sine personlige styrker og talenter, som f.eks. musikalske evner. Han kan også identifisere områder der han trenger å bli bedre, som f.eks. svake matteferdigheter.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>2. Eleven klarer å sette mål i tråd med egne interesser og behov.</b>  <i>Eksempel:</i> Linea vil begynne på kokk- og servitørfag. Hun vet at hun derfor må jobbe hardt med leksene og levere oppgaver i tide.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Kunnskap – Total spørsmål 1 + 2					
<p><b>3. Eleven klarer å ta valg og avgjørelser, og lage planer for å oppnå egne mål og forventninger.</b>  <i>Eksempel:</i> Marthe vet hvordan hun kan identifisere forskjellige strategier, vurdere fordeler og ulemper og følge opp når hun lager planer for å oppnå sine mål.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>4. Eleven klarer å gjennomføre egne planer på en god måte.</b>  <i>Eksempel:</i> Kenneth kan følge opp en bestemt plan for å ferdigstille en oppgave nøyaktig og i tide.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Kunnskap – total spørsmål 3 + 4					
<p><b>5. Eleven klarer å evaluere resultater av handlinger for å fastslå hva som fungerte.</b>  <i>Eksempel:</i> Janne vet hvilke spørsmål hun skal stille for å finne ut hvor bra hun gjør det på en oppgave.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>6. Eleven klarer å endre handlinger eller planer for å oppnå egne mål og ønsker.</b>  <i>Eksempel:</i> Anna forstår at for å bli flinkere til å spille gitar i musikktime må hun øve en halv time hver dag etter skoletid; hvis hun da enda ikke blir flinkere, må hun kanskje øve enda mer eller endre strategi.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Kunnskap – total spørsmål 5 + 6					



## EVNE til å utøve selvbestemmende atferd

<p><b>1. Eleven uttrykker egne interesser, behov og evner.</b>  <i>Eksempel:</i> Sara formidler sin interesse og talent for idrett i samtaler, skriftlig arbeid eller gjennom deltakelse i idrettsaktiviteter.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>2. Eleven setter mål som vil tilfredsstillende egne behov og ønsker.</b>  <i>Eksempel:</i> Daniel er veldig glad i å tegne og i å lage kunst. Derfor setter han seg et mål om å finne en tegneklubb som han kan gå til en gang i uken etter skolen.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Evne – Total spørsmål 1 + 2					
<p><b>3. Eleven tar valg og avgjørelser, og lager planer for å oppnå egne mål.</b>  <i>Eksempel:</i> Silje avveide fordeler og ulemper med tre forskjellige norskoppgaver, valgte å skrive en avisartikkel, lagde et oppsett for artikkelen, og lagde en tidsplan for å kunne ferdigstille oppgaven tidsnok.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>4. Eleven initierer handlinger for egne valg og planer.</b>  <i>Eksempel:</i> Hassan begynner å jobbe med en gang når han får en oppgave, eller når noen spør ham om hjelp i et prosjekt.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Evne – total spørsmål 3 + 4					
<p><b>5. Eleven søker informasjon om resultatet av egne handlinger.</b>  <i>Eksempel:</i> Thea sjekker sin oppgave for feil når hun er ferdig, og spør andre om de kan lese gjennom og gi tilbakemeldinger.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>6. Eleven endrer egne handlinger eller planer for å oppnå mål, dersom det er behov for det.</b>  <i>Eksempel:</i> Richard prøver forskjellige strategier for å løse problemer og for å ferdigstiller vanskelige oppgaver .</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Evne – total spørsmål 5 + 6					

**OPPFATNING av kunnskap og evne til å utøve selvbestemmende atferd**

<p><b>1. Eleven føler seg fri til å uttrykke egne behov, interesser og evner, selv i møte med motstand fra andre.</b></p> <p><i>Eksempel:</i> Anita forsvarer sine behov og interesser overfor alle som stiller spørsmål ved dem.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>2. Eleven føler seg fri til å sette egne mål, selv om disse er forskjellige fra målene som andre har for eleven.</b></p> <p><i>Eksempel:</i> Leo føler seg ikke hindret av andres meninger når han setter mål og forventninger for seg selv.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Oppfatning – Total spørsmål 1 + 2					
<p><b>3. Eleven føler seg fri til å ta egne valg og avgjørelser, og til å lage planer for å oppnå egne mål.</b></p> <p><i>Eksempel:</i> Amalie vurderer ofte sine foreldres forslag når hun tar valg og lager planer, men hun tar selv den endelige avgjørelsen.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>4. Eleven føler seg trygg på å kunne gjennomføre egne planer på en vellykket måte.</b></p> <p><i>Eksempel:</i> Når Markus planlegger egne aktiviteter, stoler han på at han kan fullføre dem nøyaktig og tidsnok.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Oppfatning – total spørsmål 3 + 4					
<p><b>5. Eleven føler seg trygg på å bruke tilbakemeldinger for å evaluere resultatet av eget arbeid.</b></p> <p><i>Eksempel:</i> Eva er trygg på at hun vil kunne nyttiggjøre seg tilbakemeldinger fra sine foreldre, lærere og jevnaldrende.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>6. Eleven endrer planer om og om igjen for å oppnå et mål uten å miste motet.</b></p> <p><i>Eksempel:</i> Johan er motivert til å jobbe med et prosjekt så lenge det er nødvendig, og bruker de strategiene som er nødvendige for å gjøre det bra.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Oppfatning – total spørsmål 5 + 6					

## MULIGHETER til å utøve selvbestemmende atferd PÅ SKOLEN

<p><b>1. Eleven har muligheter på skolen til å utforske, uttrykke og vise glede over egne behov, interesser og evner.</b>  <i>Eksempel:</i> Kristines lærere oppmuntrer henne til å snakke om hennes idrettsinteresser og evner og om hvilke idrettsaktiviteter hun ønsker å gjøre.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>2. Eleven har muligheter på skolen til å identifisere mål som vil møte hennes behov, interesser og evner; til å sette disse målene; og til å vise glede over disse.</b>  <i>Eksempel:</i> Sondres lærere formidler at han er ansvarlig for å sette egne mål som kan oppfylle hans behov og ønsker.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Muligheter på skolen – Total spørsmål 1 + 2					
<p><b>3. Eleven har muligheter på skolen for å lære om å ta valg og lage planer, og å være fornøyd med disse.</b>  <i>Eksempel:</i> Alis lærere tillater ham å ta egne valg og lage egne planer for skoleoppgaver, hjemmeoppgaver og fritidsaktiviteter.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>4. Eleven har muligheter på skolen til å igangsette handlinger for å oppnå mål.</b>  <i>Eksempel:</i> Michaels lærere formidler til ham at han er ansvarlig for å lage en tidsplan slik at han kan levere oppgaver tidsnok.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Muligheter på skolen – total spørsmål 3 + 4					
<p><b>5. Eleven har muligheter på skolen til å få tilbakemeldinger på hvordan planer er utført.</b>  <i>Eksempel:</i> Connies lærere er tilgjengelige for å gi tilbakemeldinger på oppgaver når hun trenger det.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
<p><b>6. Eleven har muligheter på skolen for å endre handlinger og planer for å møte egne mål og forventninger.</b>  <i>Eksempel:</i> Karolines lærer oppmuntrer henne til å ta den tiden hun trenger og sjekke arbeidet sitt så ofte som nødvendig for å møte egne forventninger.</p>	Aldri <input type="checkbox"/> 1	Nesten aldri <input type="checkbox"/> 2	Noen ganger <input type="checkbox"/> 3	Nesten alltid <input type="checkbox"/> 4	Alltid <input type="checkbox"/> 5
Muligheter på skolen – total spørsmål 5 + 6					

**VENNLIGST BESVAR FØLGENDE SPØRSMÅL:**

**Gi et eksempel på et mål som eleven jobber med.**

**Hva gjør eleven for å oppnå dette målet?**

**Hvordan er elevens fremgang på vei mot måloppnåelse?**

**TAKK!**