

**Promoting Self-Determination for Students with Intellectual Disability: A Vygotskian
Perspective**

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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.

Keywords

Intellectual disability – self-determination – SDLMI – Vygotsky – scaffolding

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 (Shogren, Wehmeyer, Palmer, Rifenbark & Little, 2015; Nota, Ferrari, Soresi & Wehmeyer, 2007; 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 et al., 2012; Wehmeyer et al., 2012). Whilst researchers have identified disability label as a predictor for self-determination, research studies indicate that the correlation between 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 (Shogren, Wehmeyer, Palmer & Paek, 2013; Hughes, Agran, Cosgriff & Washington, 2013; Björnsdóttir, Stefánsdóttir & Stefánsdóttir, 2015). 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 (World Health Organization, 1999; American Psychiatric Association, 2013). 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 (Vygotsky, 1979; Dey, Panda & Banerjee, 2014). 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 et al., 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 et al., 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.

While 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; Rätty, Kontu & Pirtimaa, 2016; Kim & Hupp, 2007). 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 adaption 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 & Lanfranhi, 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 (Bøttcher & 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 (Rätty 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 (1999) 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, while 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. While

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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