

Student-Directed Learning: A Catalyst for Academic Achievement and Self-Determination for Students with Intellectual Disability?

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Abstract

In this single-case experimental design study, eight adolescents with mild intellectual disability (ID) participated in a three-month intervention with the Self-Determined Learning Model of Instruction (SDLMI). 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 intellectual disability 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

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 problem-solve (Luckasson & 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 towards self-chosen goals (Wehmeyer et al., 2017). Because of its positive correlations with desirable post-school outcomes such as independent living (Shogren & Shaw, 2016), employment (Martorell et al., 2008), community participation (Nota et al., 2007), and self-reported quality of life (McDougall, Evans & Baldwin, 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 (Wehmeyer & Palmer, 2000; Palmer, 2010; Dunn & Thrall, 2012). However, research indicates that individuals with ID may have lower levels of self-determination than their non-disabled peers (Garrels & 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 & Shogren, 2017a).

Perspectives on self-determination

A number of theories of self-determination exist (e.g. Self-Determination Theory, Deci & Ryan, 1985; Self-Regulation Theory, Mithaug, 1993; Causal Agency Theory, Shogren et

al., 2017). 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, Wehmeyer & Palmer, 2017). 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 & 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 towards 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 & 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 & 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 & Shogren, 2017b). It is then of interest to investigate this reciprocity further. In order 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 (Wehmeyer et al., 2000).

The Self-Determined Learning Model of Instruction

The Self-Determined Learning Model of Instruction (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, etc. 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, e.g. 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 (Wehmeyer et al., 2000; Shogren et al., 2017). 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 intellectual disability students' self-determination was assessed with two different measures on self-determination, namely 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, i.e. autonomy, self-regulation, psychological empowerment, and self-realization (Wehmeyer & Kelchner, 1995). For both instruments, the student self-report was used. After a three-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 intellectual disability or learning disability participated in a one-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 intellectual disability further found significant increases in self-reported self-determination scores after a one-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, Wehmeyer, Palmer, Forber-Pratt, Little & Seo, 2017). 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, i.e. 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, Wehmeyer, and Shogren (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, Smith & Cardillo, 1994)) during a one-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 three-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; two boys and six girls) with mild ID participated. Two of the participants had an additional diagnosis of ASD, and, according to teacher reports, one of the participants was in the lower range of mild ID, i.e. 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 female) 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 & 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 three 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 in order 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, i.e. a total of eight goals. Students 1 to 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 in order to be able to read text messages from friends. Student 8 wanted to get better at reading difficult words in order to increase her experience of flow while reading books.

Instruments

To evaluate student progress towards 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 .997, i.e. 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 three-month intervention, using the AIR-S-NOR and AIR-E-NOR. The AIR-S-NOR is the Norwegian student form of the American Institutes for Research (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, i.e. 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 scale (Garrels & 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 in order to attain those goals (Shogren, Little & Wehmeyer, 2017). In this study, the first researcher performed individual interviews with each student in order 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 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. In order 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 three-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 1,2, 3, and 4 decreased their mean scores from baseline to intervention phase, i.e. 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, 6, 7, and 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 pre-test and post-test 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, $z = -.992$, $p < .046$, with a large effect size ($r = .498$). 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, $z = -2.392$, $p = .017$, with a large effect size ($r = .598$). 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, $z = -1.253$, $p = .206$, but the median score on the capacity subscale did show a slight improvement from pretest ($Md = 55$) to posttest ($Md = 57$).

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, $z = -.339$, $p = .734$. 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 three 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 towards these goals, reach higher levels of self-efficacy, and experience enhanced academic engagement and time on task behavior (Guay, Ratelle & Chanal, 2008; Furtak & Kunter, 2012; Moeller, Theiler & Wu, 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, Wehmeyer & Palmer, 2017), 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 & 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 three-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 & 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, i.e. 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, Wehmeyer & Palmer, 2017), 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 towards 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, Wehmeyer & Palmer, 2017), which emphasizes the developmental aspects of self-determination and the need for a continuous practicing and refining of self-determination skills, i.e. students require educational environments that can provide sustainable opportunities to practice self-determined behavior in order 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 towards 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 intellectual disability 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 three-month intervention is not sufficient for students to experience change in something as

complex as their own self-determination, i.e. 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., 2017), which defines self-determination as a ‘dispositional characteristic’, i.e. 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 three-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 three-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 three-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, in order 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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Biographical note

Veerle Garrels is a PhD candidate at the Department for Special Needs Education, University of Oslo. Her academic interests are learning and living conditions for people with intellectual and developmental disabilities.

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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).

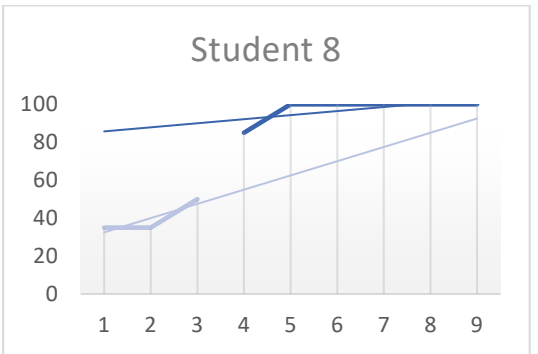
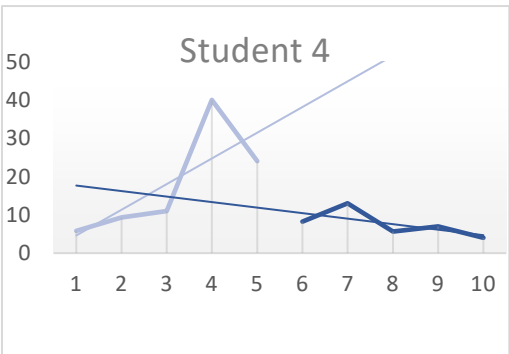
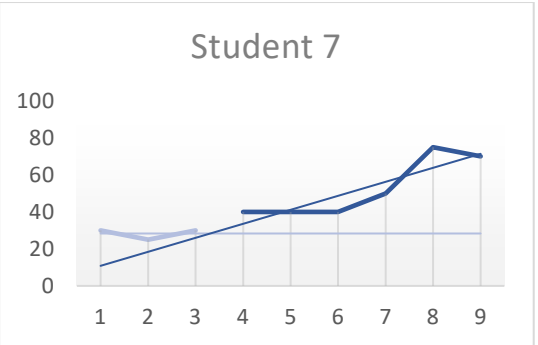
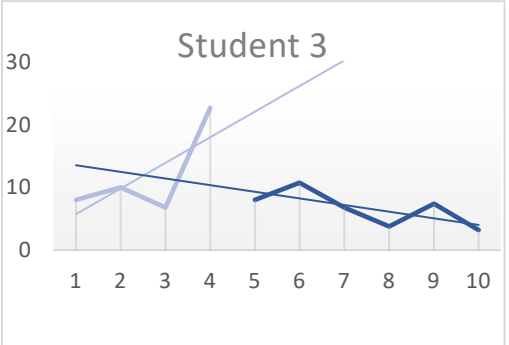
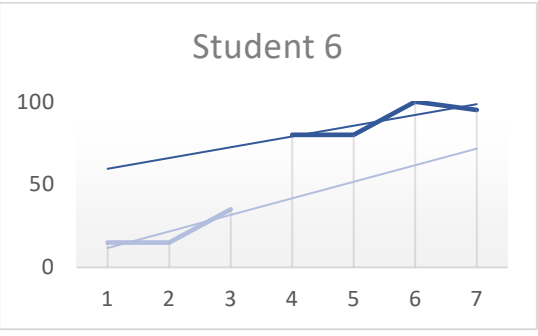
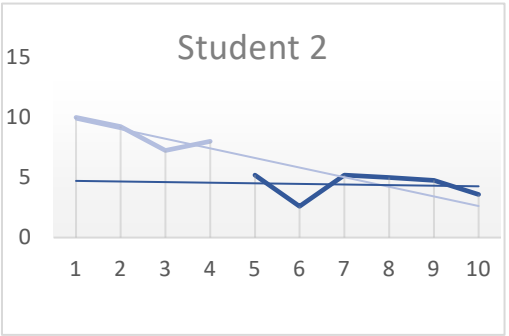
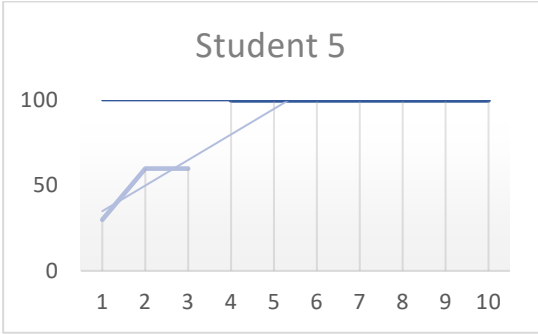
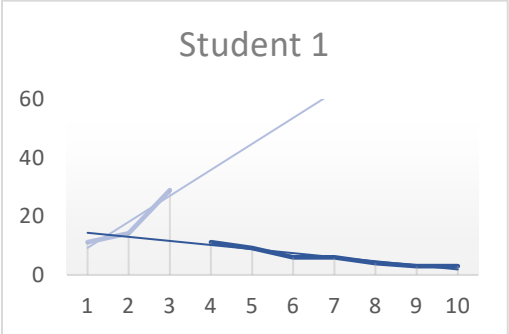


Figure 2. Mean pretest and posttest scores on AIR-E-NOR and AIR-S-NOR

