Student-directed learning of literacy skills for students with intellectual disability

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Abstract

Literacy competence is a prerequisite for community participation. Yet, many students with intellectual disability do not meet the minimum criteria for proficiency in reading and writing. With poor performance in these academic areas, motivation for learning may be dwindling, which in turn may lead to even poorer performance. The present study uses a single-case experimental design to investigate how student-directed learning may address this double challenge of motivation and performance. In the study, five adolescents (aged 13 – 15) with mild intellectual disability used the Self-Determined Learning Model of Instruction to select self-chosen goals within reading and writing skills.

Keywords

Intellectual disability – student-directed learning – literacy skills – motivation – SDLMI – multiple baseline design

Introduction

This article presents findings from a single-case experimental design study in which Norwegian adolescents with mild intellectual disability (ID) engage in a goal-setting intervention to enhance their literacy skills. According to the *International Classification of Diseases* 11th version, mild ID is a condition “originating during the developmental period and characterized by significantly below average intellectual functioning and adaptive behaviour that are approximately two to three standard deviations below the mean” (WHO, 2018). Students with ID will typically receive special education to accommodate for their

cognitive challenges, but several official reports indicate that learning outcomes for these students remain poor (Ombudsman for Children in Norway, 2017; Nordahl et al., 2018). Van der Veen, Smeets and Derricks (2010) found that approximately two-thirds of students with special educational needs appear to lag behind in literacy skills, while a study by Katims (2001) concludes that only 22 % of students with mild to moderate ID are considered to meet the minimum criteria for reading proficiency, more specifically in the areas of word recognition, reading comprehension, phonemic awareness, and writing vocabulary. Certain characteristics that are commonly associated with ID, such as difficulties with information processing, abstract thinking, and generalizing, may make proficiency in reading and writing difficult to obtain for students with ID. However, literacy is considered essential for functioning in modern society, and knowing how to read and write are important skills that facilitate inclusion in the social mainstream. Within research on literacy for individuals with ID, much of the focus has been on the acquisition of reading skills. In a simple view of reading, reading consists of two (primarily cognitive) components, namely decoding and linguistic comprehension, and a person is considered literate when the difference between oral language skills (linguistic comprehension) and written language (reading comprehension) is minimal (Hoover & Gough, 1990). Van Wingerden, Segers, van Balkom and Verhoeven (2017) compared reading comprehension, word decoding, listening comprehension, and reading-related linguistic and cognitive precursor measures of students with ID with typically developing controls. Their findings suggest that students with ID scored significantly below typical controls on all measures. Similarly, Channell, Loveall & Connors (2013) found in their study that adolescents with ID scored lower than typically developing youth on word recognition, phonological decoding, phonological awareness, and phonological memory. A study by Wei, Blackorby and Schiller (2011) which compared reading achievement of students with disabilities also concluded that students with ID

performed lower than students with other disabilities, such as autism or speech or visual impairments.

Even though literacy research in the field of ID has primarily focused on reading skills, literacy also encompasses writing skills. Like reading, written expression requires a number of complex skills, such as ideation and organization of thoughts, knowledge of vocabulary, grammar, and text structure, spelling skills, and an understanding of punctuation rules (Bui, Schumaker & Deshler, 2006). Despite these complex cognitive demands that proficiency in writing poses, a review of the scarce literature that is available suggests that students with ID can benefit from writing instruction, and that they can improve their mastery of writing skills through proper instruction (Joseph & Konrad, 2009). Indeed, research supports the notion that students with ID improve their proficiency in reading and writing with age, indicating that instruction in reading and writing may be efficient also for students with ID (Ratz & Lenhard, 2013).

Unfortunately, instruction in reading and writing may be complicated by students' low motivation for these tasks. Van der Veen and colleagues (2010) found that, according to teacher reports, a majority of the students in special education shows problematic attitudes towards school work, and educators indicate that one of their biggest challenges is finding ways to boost reading motivation in poor readers (Allen, Schockley & Baumann, 1995). Research has shown that students' reading motivation and reading behavior decline across the elementary school years (McKenna, Kear & Ellsworth, 1995), which may be alarming, since even in first and second graders, motivation appears to play a significant role in students' reading comprehension (Cartwright, Marshall & Wray, 2016). Already in 1986, Stanovich identified a negative Matthew effect, suggesting that reading difficulties may lead to behavioral, cognitive and/or motivational challenges, which in turn lead to even poorer reading skills, or, as Morgan and Fuchs (2007) state, poor readers may soon lag behind their

peers in both “skill” and “will”. This suggests that the simple view of reading with its traditional predictors of decoding and linguistic comprehension (Hoover & Gough, 1990) may be too much of a simplification, and affective and motivational processes may add to the complexity of reading comprehension (Guthrie et al., 2007). Thus, even though cognitive factors have traditionally dominated our understanding of reading comprehension, there are clear indications that reading skills correlate with reading motivation. The bidirectionality of the relationship between reading skill and reading motivation suggests that practitioners may need to address motivational issues in their teaching, in order to help poor readers become proficient (Morgan & Fuchs, 2007).

De Naeghel, Van Keer and Vanderlinde (2014) distinguish between autonomous and controlled types of reading motivation, where autonomous reading motivation suggests that students engage in reading activities for their own enjoyment, or because of the perceived personal significance of the activity. Controlled reading motivation on the other hand suggests that students read in order to comply with external demands. The underlying motivation for students’ actions has consequences for the quality of those actions (Reeve, Ryan, Deci & Jang, 2012). Indeed, students’ motivation plays a pivotal role in initiating, guiding, and sustaining efforts. As Reeve and colleagues (2012) postulate, intrinsic or autonomous motivation fuels engagement and learning, and intrinsically motivated students seek out and enjoy optimal challenges. Thus, when students engage in reading activities because of their own wanting, this is likely to stimulate and strengthen their proficiency in reading, as students show more perseverance and engage more proactively in their learning activities. It is likely that similar motivational processes are at work in the mastering of writing skills. Problematic attitudes towards school work, such as helplessness, procrastination, task avoidance and cognitive disengagement, may be remediated by activating students’ inner motivational resources. Reeve and colleagues (2012) argue that

these inner resources are in part a function of the social context, and they become apparent when the context supports and nurtures students' autonomy. This is in line with findings from a meta-analysis by Shogren, Faggella-Luby, Bae and Wehmeyer (2004), which concludes that providing students with disabilities with choice opportunities resulted in clinically significant reductions in the occurrence of problem behavior. Real and meaningful choice opportunities allow individuals to exert control over their lives, thus stimulating their autonomous motivation. For students with ID, promoting active student engagement in the learning process and addressing students' intrinsic motivation for learning activities may be quintessential for their literacy development and for directing students' attention and energy towards learning tasks. Thus, teacher behavior may have an important impact on student motivation. A central question remains then how educators may activate the intrinsic motivation for learning in students with mild ID. One possible way of doing so may be by implementing the Self-Determined Learning Model of Instruction (Wehmeyer, Palmer, Agran, Mithaug & Martin, 2000).

The Self-Determined Learning Model of Instruction

The Self-Determined Learning Model of Instruction (SDLMI) is an evidence-based instructional model that enables educators to engage students with and without disabilities in student-directed and self-regulated learning. The SDLMI consists of three phases, in which students are supported to 1) identify a personally relevant goal, 2) develop an action plan that may lead to goal attainment, and 3) self-monitor and evaluate progress towards goal attainment (Shogren, Wehmeyer, Burke & Palmer, 2017). Within each phase, students work with student questions that guide them through a problem-solving sequence. Even though the model emphasizes student-directed learning, the educator plays an important role as instructor, facilitator, and advocate throughout the entire process. Thus, conversation, discussion, and support are central elements of the SDLMI. The SDLMI can be used in a

variety of situations and for a broad array of goals, such as enhancing access to the general curriculum (e.g. Lee, Wehmeyer, Palmer, Soukup & Little, 2008), promoting social interaction (e.g. Garrels, 2018), or involving students in vocational planning (e.g. Benitez, Lattimore & Wehmeyer, 2005).

The SDLMI has been used in several large randomized control trials and single-case experimental design studies, and research has indicated that its use may lead to significant increases in self-determination for students with intellectual disability or learning disabilities (Wehmeyer, Palmer, Shogren, Williams-Diehm & Soukup, 2013; Wehmeyer, Shogren, Palmer, Williams-Diehm, Little & Boulton, 2012). Other studies have suggested that the SDLMI may be an effective intervention for goal attainment for students across grade levels and disability categories (Lee, Wehmeyer & Shogren, 2015; Kleinert, Harrison, Dueppen, Mills & Traylor, 2014).

Purpose of the study

Research indicates that students with ID may encounter difficulties with acquiring proficiency in reading and writing, and that they often struggle with motivation for school work. Further, research consistently shows that when students experience autonomous motivation for their school work, this contributes to an optimization of their learning. Yet, few studies have looked into how educational interventions may address issues of autonomous motivation and the improving of literacy skills in students with ID, and more research is required to investigate how one can structure literacy education for this target group in ways that are efficient, effective, and motivating (Copeland, McCord & Kruger, 2016). Therefore, the aim of this study is to explore whether students with ID are capable of identifying personally and academically relevant goals for themselves within reading and

writing skills, and whether they can attain these goals through student-directed learning. In order to explore these questions, the study uses an intervention with the SDLMI.

Method

Participants

This study included five adolescents with mild ID, aged 13-15 years old. Students were recruited from two different classrooms in a special education school in eastern Norway, where there were approximately 8-10 students in each classroom, all of them with a diagnosis of intellectual disability. A diagnosis of ID was confirmed for all participants by documentation from the pedagogical-psychological services. Three special educators who were responsible for the participating students' school curriculum were actively involved in the implementation of the intervention. Participants were the following:

- *Carrie*: a 15-year old girl with mild ID. Carrie was an active and dedicated student, who showed a strong motivation for doing well and for challenging herself at school. She showed good insight in her own strengths and needs, had good social skills, and appeared cheerful. According to Carrie's teacher, she had certain challenges with memory which affected her school work, as she would easily forget skills that had previously been mastered.
- *Theo*: a 13-year old boy with mild ID and autism spectrum disorder. Theo had little experience with student-directed learning or goal setting, and encountered some difficulties with identifying own interests, needs, and strengths. He had only learned how to read and write two years earlier but had now developed a major interest in writing long phantasy stories. According to his teacher, Theo found it hard to deal with corrective feedback from adults, and he would easily get upset by what he experienced as criticism.

- *Cathy*: a 15-year old girl with mild ID. Cathy appeared to be pretty much unaware or in denial of her cognitive challenges, and had high ambitions for her future life, e.g. that she would study to become a nurse. This desire was not reflected by her efforts and achievements at school (she was seriously behind on the general curriculum in all school topics), and she would frequently try to avoid doing school tasks by claiming that they were too easy for her.
- *Julia*: a 15-year old girl with mild ID and slight cerebral palsy. She showed a remarkable amount of reflectivity and insight in her own challenges and needs, and she could communicate her thoughts effectively. While she seemed rather self-aware, she also expressed a strong conviction that she could overcome most of her difficulties as long as she put in the necessary effort.
- *Gillian*: a 14-year old girl with mild ID, but, according to her teacher, bordering to moderate ID. Gillian was a lively teenager who spent a lot of effort trying to catch up with the other girls in her classroom. Gillian's attention span and verbal language skills were significantly lower than those of her classroom peers, and her teacher found it hard to meet Gillian's educational needs within the classroom setting.

Design and procedure

This article presents findings from a single-case experimental study with a multiple baseline design. Single-case research offers a powerful methodology that can play an important role in the development of evidence-based practice within the field of special education (Horner, Carr, Halle, McGee, Odom & Wolery, 2005). Kratochwill and colleagues (2010) developed four criteria that single-case studies need to fulfill in order to meet evidence standards. Firstly, the independent variable (i.e. the intervention) must be systematically manipulated. Secondly, 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. Thirdly, the study must include at least three attempts to demonstrate an intervention effect, e.g. a multiple baseline study should include a minimum of at least three baselines. Finally, each phase in the study (i.e. each baseline and intervention phase) must have at least three data points. When these rigorous standards are met, single-case research can be used to identify causal relationships between variables.

In this study, the researcher gave participating teachers an introductory lecture on the benefits of student-directed learning and self-determination, followed by a second lecture on the SDLMI in which the model and its application were presented. The researcher also had initial conversations with the students to guide them through the content and aim of the intervention, and to introduce them to concepts such as “goal” and “plan”. To make sure that the intervention was implemented systematically and consistently for each participant, the implementation was effectuated by the researcher, but with teachers participating in most of the conversations with the students throughout the intervention, as well as helping students to work on their action plan between the second and third phase of the SDLMI. This way, the first standard for evidence-based interventions, i.e. a systematic manipulation of the independent variable, namely the SDLMI, was met.

During the first phase of the SDLMI, participating students were encouraged to define short-term goals within reading or writing skills. The researcher assisted students during this process by asking targeted questions, such as what students felt they were good at and in which areas they felt they could develop their skills further. Generally, students mentioned a number of skills that they wanted to improve, and they were then encouraged to identify the one goal that they wished to work on most of all. Students worked through the student questions of the SDLMI’s first phase, in order to identify what they already knew about their chosen goal, which barriers they thought they could encounter, and which supports they

thought could help them in their goal attainment. The following goals were selected by the students:

- *Carrie* identified her challenges with reading long words (three syllables or more), and how that affected her experience of reading flow when reading a novel. She explained that when reading long words, she could not “recognize” these words, and therefore, she needed to decode each letter separately before combining them again, but often she experienced that she no longer remembered the first sounds when she came towards the end of the word. Her goal was then to be able to recognize long words from a book that she wanted to read, so a list of 20 words was chosen from that book.
- *Theo* selected a goal of finding a suitable pace when reading aloud. He would usually ignore punctuation, which made it difficult for others to comprehend what he was reading. Also, when writing stories, he would not use punctuation. Theo was the only student in the study who struggled with identifying a self-chosen goal, and he was assisted by his teacher in choosing this particular goal.
- *Cathy* identified a goal that was closely related to her interest in medicine and nursing, as she wanted to become fluent in writing anatomical vocabulary. She selected a list of ten difficult words from an anatomy book that she cherished.
- *Julia* described how she often struggled with grasping the story in a book. She elaborated that, when reading a chapter in a book one day, she would often not remember what she had read until the next day. Therefore, she wanted to work on how she could better retrieve information from books that she read.
- *Gillian* said she wanted to become a writer, and she derived a short-term goal from this desire, namely that she would like to be able to write longer sentences when writing texts. Before participating in the study, she had already compared her own

writings with those of her classroom peers and had observed that her sentences were not as long as those of others. With assistance from the researcher, the goal was specified to being able to use more adjectives in her sentences.

After students had pinpointed these personally relevant goals, they then continued on to the second phase of the SDLMI, where they developed an action plan that would help them attain their chosen goal. As students appeared to be less experienced with developing plans than with identifying goals, more guidance from the researcher was required in this phase. To support students in developing a viable action plan for goal attainment, the researcher introduced different pathways towards goal attainment to the students, e.g. different types of drill exercises that students could choose from, different kinds of self-monitoring, suggestions about the amount of time and frequency of working on the goal, etc. Students were then free to choose whichever approach they thought would be most suitable for them. The following action plans were chosen by the students:

- *Carrie*: a set of drill exercises to learn to sight-read new vocabulary; using a stop-watch to practice reading faster; using a registration sheet for self-monitoring time spent on working towards her goal.
- *Theo*: reading a social story about reading aloud and pausing at full stop before each reading task; using a power card on his desk to remember to pause while reading aloud;
- *Cathy*: a variety of drill exercises to learn how to write the new vocabulary; self-monitoring of time spent on working towards goal;
- *Julia*: drawing a mind-map for each chapter that is read, with support questions in order to help systemize the content (which characters, what action, when, where?);
- *Gillian*: a variety of oral and written exercises to learn new adjectives; using a registration sheet for self-monitoring time spent on working towards the chosen goal.

After students had identified their preferred goal and action plan, the researcher developed individualized continuous measures that could be used to assess students' progress towards goal attainment. For all students, the continuous measures were formulated in percentage of correct performance. A baseline phase of minimum three data points was then established for all students with their respective continuous measure. Baseline phases were kept as short as possible, in order to avoid learning during this phase. After baseline assessment, students started working on their action plan in order to attain their chosen goal. For each student, the researcher plotted data points into a chart, so that students could get a visual presentation of their progress towards goal attainment. Data was collected until every student had at least three data points in the intervention phase, in order to meet the fourth criteria for evidence-based standards (Kratochwill et al., 2010). During baseline and intervention phase, the researcher collected data from all students approximately two times per week, which meant that the study lasted approximately five weeks.

After sufficient intervention phase data was assessed for all students, the researcher went through the third phase of the SDLMI with the students. Here, students used the student questions to evaluate whether they had attained their chosen goals, what they had learned, and which barriers they had overcome while working towards their goal. Students then also went through a brief interview with the researcher, in order to elicit information about how students experienced the SDLMI and student-directed learning.

To guarantee that the study also fulfilled the third criterium for evidence-based standards, namely a minimum of three attempts to demonstrate a possible intervention effect, this study included five participants. This number of participants was considered sufficient to guarantee that a minimum of three attempts would be available in the final analysis of the study, even in the eventuality of attrition. However, all students participated throughout the entire intervention.

Instruments

In this study, the researcher developed the following individualized continuous measures for each of the student goals:

- *Carrie*: reading as many words as possible within 20 seconds from a vocabulary list of 20 words. If all words were read correctly, this gave 100 % correct performance, 10 words equaled 50 %, etc.
- *Theo*: reading aloud short texts; pausing at each full stop resulted in 100 % correct performance.
- *Cathy*: a dictation of the ten words that she had chosen. Ten correctly spelled words equaled 100 % correct performance.
- *Julia*: a set of questions after each chapter that she read, in order to check reading comprehension. All questions answered correctly resulted in 100 % correct performance.
- *Gillian*: writing five sentences, each time based on a different illustration; using two adjectives in each sentence gave 100 % correct performance.

In addition, the researcher administered brief interviews with each of the participating students for reasons of social validity. Each interview lasted approximately 15 minutes and was audio-recorded for later analysis. A structured interview guide as well as visual supports were used during these interviews. The interviews provided information about which aspects of the intervention students valued most, and how they experienced using the SDLMI in order to set and attain self-chosen academic goals.

Interobserver agreement

A research assistant assessed student performance in a total of 22.2 % of all collected data points (26.3 % of the baseline data points, 19.2 % of the intervention phase data points), thus meeting the second criterium for evidence-based practice by Kratochwill et al. (2010), who state that a study needs to collect interobserver agreement in all phases and on at least 20 % of all sessions. Interobserver agreement was then calculated by means of percentage agreement, and was found to be 1.0, i.e. excellent agreement.

Analysis

Data from this study were analyzed based on four criteria for visual analysis for single-case experiments as presented by Kazdin (2011), namely 1) changes in mean across phases, 2) changes in level across phases, 3) changes in trend or slope, and 4) latency of the change.

Changes in mean refer to changes in the average rate of performance on the continuous measure. Changes in level indicate that there is a shift or a leap from the end of the baseline phase to the beginning of the intervention phase. Changes in trend or slope refer to the trend line that characterizes the data within each phase. Latency of the change refers to the immediacy of a possible change, i.e. whether the onset of a change appears closely in time after the experimental conditions have been changed (Kazdin, 2011, pp.288-291).

Ethics

This study was approved by the Norwegian Center for Research Data. Written consent was obtained from the students' parents, while students assented orally to participate in the study.

To ensure that the students' assent was informed, they were provided with an information sheet about the study, which explained the purpose of the study using "easy Norwegian" and visual support. Students were also given specific information about what they could say in case they wanted to withdraw from the study, and the researcher emphasized that participation was voluntary. During the intervention, the researcher checked regularly

whether the participants wished to continue participating in the research project, which all of them confirmed. For the purpose of anonymity, names of the students have been changed in this article.

Results

Figure 1 displays the mean percentage of correct performance for each participant for baseline and intervention conditions. Baseline means ranged from 8 % to 75 %, which may indicate that for some of the students (Julia and Cathy in particular) their goal attainment was already well within reach at baseline. Nonetheless, mean percentages during the intervention phase range from 89.2 % to 100 %, indicating that all participants had a significant improvement in mean from baseline phase to intervention phase.

A visual analysis of the graphs in figure 2 indicates that for all students except for Julia, there is a relatively clear change in level from baseline phase to intervention phase. The shift in level from the end of the baseline phase to the beginning of the intervention phase indicates that the intervention with the SDLMI sparked the change in student performance, i.e. when students started working on their action plans in the second phase of the SDLMI, this improved their performance on their self-chosen goal significantly.

Analysis of the trend lines in figure 2 indicates that, for Theo, Cathy, and Gillian, the slope of the baseline data is downward, i.e. opposite of what the intervention is expected to achieve, whereas the trend line during intervention phase for these participants is upward. This confirms the hypothesis that the intervention led to a positive change in the performance of these participants. For Julia and Carrie, the trend lines during baseline indicate that their performance was already improving before the intervention started, which could suggest that there was a learning effect from the continuous assessment. However, the trend lines during

baseline and intervention phases do indicate that the intervention with the SDLMI may have accelerated the students' improvement.

Finally, a visual inspection of the multiple baseline graphs indicates a short latency of the change for all participants except for Julia. For Theo, Cathy, Gillian, and Carrie, the onset of the intervention is associated with a clear improvement in performance, suggesting that, when students start working on their action plan in order to attain their goals, this enhances their goal attainment rather immediately. In other words, the action plans that the students chose to help them attain their goals were largely successful.

In total, visual inspection of the data from this study show a relatively consistent pattern. Investigation of change in mean, change in level, change in trend, and latency of the change suggest that the SDLMI provides a useful and effective intervention to help students attain self-chosen goals within reading and/or writing. The clarity of the pattern may have been influenced by different factors, as will be discussed in the next section of this article.

Information from the qualitative interviews with the students revealed that students were highly positive about using the SDLMI in the classroom. They identified being able to choose personally relevant goals as an important factor for enhancing their motivation for school work, they experienced a sense of pride when seeing the results of their efforts, and they enjoyed challenging themselves. Students also said that they wanted to continue using the SDLMI after the intervention was finished.

Discussion

Whereas illiteracy is associated with stigma (Beder, 1991), literacy may open up doors to employment opportunities, create access to community participation, and increase social interaction (deFur & Runnells, 2014; Forts & Luckasson, 2011). However, cognitive

challenges may complicate the acquisition of literacy skills for individuals with ID, and low motivation may form an additional barrier to the acquisition of fluent reading and writing skills (Morgan & Fuchs, 2007). Thus, individualized literacy instruction should not only address students' cognitive needs and challenges, but should also take into consideration students' interests and how they wish to use literacy in their daily lives, in order to enhance motivation and persistence during the learning process (Copeland, McCord & Kruger, 2016). Therefore, this study aimed to explore whether students with ID could use a student-directed learning intervention with the SDLMI in order to set and attain personally and academically relevant literacy goals.

Findings from the study suggest that participants in this study were capable of setting and attaining relevant academic goals within reading and writing. Students identified goals that targeted different components of effective literacy instruction, such as phonics (cf. Cathy's goal), vocabulary development (cf. Gillian's goal), reading fluency (cf. Theo's and Carrie's goals), and reading comprehension (cf. Julia's goal) (Copeland et al., 2011). Even though students – logically enough – may not have the necessary awareness of the wide variety of skills they need to master in order to achieve literacy, their choice of goals in this study suggests that they may have suitable insights in their own strengths and needs regarding their reading and writing skills. The SDLMI may then be a useful tool for practitioners to help students formulate academic goals based on this self-knowledge. Previous research has indicated that literacy instruction for students with extensive support needs has been characterized by low expectations for their potential, and that it typically focuses on sight word instruction (Copeland, McCord & Kruger, 2016; Copeland et al., 2011). Findings from this study suggest that students with mild ID do not share these low expectations for their academic progress, and that they, when given the choice, prefer academic goals that are 1) relevant to the development of their reading and writing skills, and 2) realistic with regard to

their own cognitive potential. Findings from this study further emphasize the important role that educators play to support student motivation for school work. This study included only one round of goal-setting for each of the participating students, and it would be interesting to explore whether students can identify goals for themselves that address different literacy components, e.g. if a student first identifies a certain goal within vocabulary development, would this student at the next opportunity be able to identify a goal within another domain, such as reading fluency or reading comprehension? Further research is needed to investigate this.

In this study, students used the student questions of the SDLMI and guidance from the researcher and educator in order to refine their goals, so that these could be attained within a reasonable time span. Participants in the study had little or no experience with student-directed learning, goal-setting, or planning prior to the intervention, which may be relatively common for students with ID (Garrels, 2017). However, this lack of previous experience or competence should not be considered a barrier to engaging students in their own learning process. On the contrary, it is important for educators to understand student-directed learning as the learning process that it is. It should not be expected of students that they are already competent at identifying their own strengths and needs, at setting adequate goals for themselves, or at developing action plans before introducing them to student-directed learning. All students, regardless of their cognitive skills, need to be provided with frequent opportunities and training to practice and refine the required skills for active participation in their own learning processes. Students need to be asked the right questions in order to be able to identify their own strengths and needs, and they may require various degrees of support to master goal-setting and planning. In this study, students took an active lead in identifying personally relevant literacy goals, but they needed help with identifying criteria for goal attainment as well as with developing an action plan to attain their chosen goals. Rather than

seeing this as a weakness of the study, this could be understood as illustrative of the students' present level of functioning, and as a gradual move towards more student involvement in other aspects of the learning process. As Copeland and Hughes (2002) suggest, limited skills for goal attainment may, in part, be associated with a lack of instruction in such strategies. The SDLMI may then provide educators with a useful instructional model to create an autonomy-supportive environment, so that students can experience a social context that stimulates them to challenge themselves and to set goals for their further development.

Findings from this study further suggest that, while all participating students reported that they enjoyed the freedom to choose personally relevant goals and that this affected their motivation in a positive way, some students chose goals that in fact may have been too easy for them. This may be indicative of low levels of self-efficacy, where some students may lack the confidence that they have what it takes to pursue more challenging goals. Bandura (1986) suggests that self-reflection lies at the basis of judgements that one makes about one's capabilities. It can be hypothesized that many students with ID may have prior experiences of failure and of not mastering academic challenges, which may have caused them to develop avoidance behavior. It is then important that students encounter a safe learning environment in which they are provided repeated opportunities to practice and master new skills. With frequent mastery experiences, students may start to feel more capable, and a "habit" of academic self-efficacy may develop. As Pajares (2012) claims, educators do wisely to take seriously their share of responsibility in nurturing the mental health habits of their students, and student-directed learning may prove a fruitful way of doing so.

Limitations of the study

This article reports the findings from a small study with few participants and a brief intervention period only. Even though single-case experimental design studies require a

rigorous methodology so that causal inferences can be drawn, interpretation of the research results in this study warrant care. First of all, while the researcher contacted schools in order to recruit participants, educators selected the final participants based on their own judgement, and this may have caused selection bias in the study sample. It is possible that educators chose participants that differed in certain ways from other students with mild ID who were not selected to participate. Secondly, this study did not include a maintenance phase, and therefore, it cannot be concluded whether students maintained their goal attainment after the intervention phase. Also, it is not known whether any generalization of newly acquired skills emerged. Finally, as this intervention was effectuated by the researcher, it is difficult to conclude with certainty about the applicability of the SDLMI in everyday school situations. However, it can be emphasized that all participating students in this study wished to continue using the SDLMI after the intervention, and there occurred no attrition during the study.

Implications for future practice and research

With research indicating that students in special education often show problematic attitudes and low motivation for school work (Van der Veen et al., 2010), it is important for educators to address students' autonomous motivation for learning literacy skills as early as possible. The establishing of learning environments that maximize student-directed learning is recommended (Shogren et al., 2004). While this study looked into how the SDLMI can be used to enhance literacy skills in adolescents with mild ID, many students at this age may already have developed low levels of self-efficacy, and this mental disposition may be difficult to reverse (ref.). Therefore, more research is required to investigate ways to implement student-directed learning in younger students, and to explore whether the SDLMI can be used to help students attain literacy and other academic goals from an earlier age on.

Conclusion

This single-case experimental design study investigated whether students with mild ID are capable of setting and attaining personally and academically relevant goals within reading and writing skills. While literacy is an important key to community participation, individuals with ID often have poor literacy skills, and they may show low motivation for school work aimed at improving these skills. Student-directed learning may be a way of addressing both these issues simultaneously. Findings from the study suggest that students with mild ID may be able to identify relevant goals within different literacy domains, and, with the necessary help from adults, they may be able to follow action plans that help them attain these self-chosen goals.

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Figure 1. Mean percentage of correct performance during baseline and intervention phase.

Figure 2. Percentage of correct performance for individualized literacy goals, with trend lines for baseline and intervention phases.