

## The effect of evidence-based practices to enhance self-determination in students with intellectual disabilities: a systematic literature review

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**Abstract:** Promoting self-determination in students with intellectual disabilities is essential in enabling them to achieve education-related goals and positive post-school employment, community participation, and quality of life outcomes. By teaching skills associated with self-determination, such as choice-making, decision-making, problem-solving, goal setting and attainment, planning, self-management, self-advocacy, self-awareness, and self-knowledge, students with intellectual disabilities are better prepared to make purposeful decisions and choices. We initiated a systematic literature review on evidence-based practices that promote self-determination and associated skills in students with intellectual disabilities in educational settings. In this literature review, we indicated types of interventions and research design developed in the school system, student populations involved in structured interventions, self-determination assessment and evaluation tools, targeted skills associated with self-determination, and outcomes. Results demonstrated that the evidence-based practices implemented to develop self-determination can be effective and can prove efficiency for students across grade levels, from mild to moderate intellectual disabilities.

**Keywords:** Self-determination, Evidence-based practices, Students with intellectual disabilities, Academic achievement, Quality of life.

### Introduction

#### Self-determination

Self-determination is a construct referring either to the determination of one's own fate or course of action, or to the rights of nations or groups of people to autonomy and self-governance. The term was appropriated by disability rights advocates and people with disabilities to refer to their “right” to have control in their lives (Nirje, 1972; Williams, 1989). Self-determination refers to a quality or characteristic within a person that determines his or her own fate or course of action. The personal sense of the term emerged from the philosophical doctrine of

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determinism, which suggests that all action, including human behavior, is, in some way, caused.

### *Self-Determination Theory (SDT)*

The term of self-determination appeared in the literature pertaining to motivation, particularly in the work of Deci and Ryan (1985). In this initial research, self-determination refers to an internal need contributing to an individual's performance of intrinsically motivated behaviors. According to these theorists, humans are inherently active and internally motivated to engage in activities for which there are no obvious external rewards. Deci and Ryan (1985) listed children's propensities to want to learn, undertake challenges and solve problems as examples of such internally motivated behaviors. Intrinsic motivation is the "energy source that is central to the active nature of the organism" (Ryan & Deci, 1985, p. 11) and is defined as "the innate, natural propensity to engage in one's interests and exercise one's capacities, and in so doing, to seek and conquer optimal challenges" (Ryan & Deci, 1985, p. 43). Accordingly, Deci and Ryan (1985) defined self-determination as the capacity to choose and to have those choices, rather than reinforcement contingencies, drives or any other forces or pressures, be the determinants of one's actions. Using the empirical process, Ryan and Deci (2000) identified three critical needs which are required to be satisfied: the need of competence, the need of relatedness, and the need of autonomy. These needs seem to be essential for facilitating the optimal functioning of the natural propensities for growth and integration, as well as for constructive social development and personal well-being.

Ryan and Deci (2017) demonstrated that Self-Determination Theory (SDT) represents a broad framework for the study of human motivation and personality. According to the SDT authors, this theory articulates a meta-theory for framing motivational studies, a formal theory that defines intrinsic and varied extrinsic sources of motivation, and a description of the respective roles of intrinsic and extrinsic motivation in cognitive and social development and in individual differences. The SDT prepositions stated by Ryan and Deci (2017) also focus on how social and cultural factors facilitate or undermine people's sense of volition and initiative, in addition to their well-being and the quality of their performance. The conditions supporting the individual's experience of autonomy, competence, and relatedness are argued to foster the most volitional and high-quality forms of motivation and engagement for activities, including enhanced performance, persistence, and creativity. In addition, SDT proposes that the degree to which any of these three psychological needs is unsupported or thwarted within a social context will have a robust detrimental impact on wellness in that setting.

SDT comprises six mini-theories, each of which was developed to explain a set of motivationally based phenomena that emerged from laboratory and field

research. Each, therefore, addresses one facet of motivation or personality functioning: Cognitive evaluation theory, Organismic integration theory, Causality orientation theory, Basic psychological needs theory, Goal contents theory, and Relationship motivation theory (Ryan & Deci, 2000). In addition to formal theory development, research has applied SDT in many domains including education, organizations, sport and physical activity, religion, health and medicine, parenting, virtual environments and media, close relationships, and psychotherapy. Across these domains research has looked at how controlling versus autonomy-supportive environments impact functioning and wellness, as well as performance and persistence. By focusing on the fundamental psychological tendencies toward intrinsic motivation and integration, SDT occupies a unique position in psychology, as it addresses not only the central questions of why people do what they do, but also the costs and benefits of various ways of socially regulating or promoting behavior.

#### *Self-Determination as an educational outcome in the special education field*

Promoting self-determination of adolescents with disabilities became a best practice in secondary education and transition services for several reasons. First, self-determination status has been linked to the attainment of more positive academic and transition outcomes, including more positive employment and independent living, recreation and leisure outcomes, and more positive quality of life and life satisfaction. Second, research in special education domain indicated that students with intellectual disabilities, learning disabilities, emotional and behavioral disorders and autism are less self-determined than non-disabled peers (Shogren et al., 2015). Third, there is clear evidence that if provided adequate instruction, students with disabilities can become more self-determined. In a meta-analysis of single subject and group subject design studies, Algozzine and colleagues (2001) found evidence for the efficacy of instruction promoting component elements of self-determined behavior, including interventions to promote self-advocacy, goal setting and attainment, self-awareness, problem-solving skills, and decision-making skills. Cobb and colleagues, in 2009, conducted a narrative meta-synthesis (a narrative synthesis of multiple meta-analytic studies) covering seven existing meta-analyses examining self-determination and concluded that there is sufficient evidence to support the promotion of self-determination as effective.

To prove the essential role of interventions in promoting self-determination in students with disabilities, Wehmeyer and colleagues (2013) conducted a randomized trial control group study of the effect of interventions to promote self-determination on the self-determination of high school students receiving special education services under the categorical areas of intellectual disability and learning disabilities. They found that students with cognitive disabilities who

participated in interventions to promote self-determination over a three-year period showed significantly more positive patterns of growth in their self-determination scores than did students not exposed to interventions to promote self-determination. Furthermore, in a follow-up study of the treatment and control group intellectually disabled students initiated by Wehmeyer and colleagues (2013), they investigated the outcomes one and two years after leaving school. The study measured employment, community access, financial independence, independent living, and life satisfaction outcomes. Results indicated that self-determination status at the end of high school predicted significantly more positive employment, career goal, and community access outcomes. Students who were self-determined were significantly higher in all these areas. These studies study demonstrated causal evidence that promoting self-determination results in enhanced self-determination, and that enhanced self-determination results in more positive adult outcomes, including employment and community inclusion (Shogren et al., 2015).

#### *Functional Model of Self-Determination*

Wehmeyer and colleagues (1996) proposed a functional theory of self-determination, so-called because actions are viewed as self-determination based upon the function they serve for the individual, in which self-determination is viewed as a dispositional characteristic (enduring tendencies used to characterize and describe differences between people). Self-determined behavior refers to “volitional actions that enable one to act as the primary causal agent in one’s life and to maintain or improve one’s quality of life” (Wehmeyer & Abery, 2013, p. 399). Causal agency implies that it is the person who makes or causes things to happen in his or her life, that he or she acts with an eye toward causing an effect to accomplish a specific end or to cause or create change.

Wehmeyer and Kelchner (1995) noted that there are a number of component elements whose development are integral to the emergence of the four essential characteristics of self-determination. These component elements cannot be used to define self-determination, but the acquisition of each is necessary, if not sufficient, for the expression of self-determined behavior. Although not intended as an exhaustive taxonomy, the following component elements seem particularly important to the emergence of self-determined behavior: choice-making, decision-making, problem-solving, goal setting and attainment, self-observation, evaluation, and reinforcement, internal locus of control, positive attributions of efficacy and outcome expectancy, self-awareness, and self-knowledge. The development and acquisition of these component elements is, however, lifelong and begins early in life. Some elements have greater applicability for secondary education, while others will focus more on elementary years. Promoting self-determination as an educational outcome will require not only a purposeful

instructional program, but one that coordinates learning experiences across the span of a student's educational experience (Wehmeyer & Kelchner, 1995).

Wehmeyer and Abery (2013) highlighted that the Functional Model of Self-determination has been empirically validated (Shogren et al., 2008), operationalized by the development of an assessment linked to the theory (Wehmeyer et al., 1996), served as the foundation for intervention development, particularly with regard to the development of the self-determined learning model of instruction and related efforts (Wehmeyer et al., 2000), and provided an impetus for a variety of research activities.

*Causal Agency Theory. A reconceptualization of the Functional Model of Self-Determination*

Causal Agency Theory conceptualizes self-determination as a general psychological construct within the organizing structure of theories of human agentic behavior. Human agentic theories share the meta-theoretical view that organismic aspirations drive human behaviors (Shogren et al., 2017). Drawing on the foundational understanding of self-determination as (a) self-caused action from philosophy, (b) a central process of an organism in the movement toward autonomous determination, from personality psychology, and (c) motivated by the basic psychological needs of competence, autonomy, and relatedness from Self-Determination Theory, Shogren and colleagues (2017) propose the Causal Agency Theory to explain how people become self-determined, that is how they define the actions and beliefs necessary to engage in self-caused, autonomous action that addresses basic psychological needs. Within the context of Causal Agency Theory, which represents specific layers of human agency, self-determination is defined as a: "...dispositional characteristic manifested as acting as the causal agent in one's life. Self-determined people (i.e., causal agents) act in service to freely chosen goals. Self-determined actions function to enable a person to be the causal agent in his or her life" (Shogren et al., 2017, p.18). In this conceptual frame, some key terms and assumptions must be taken in consideration: dispositional characteristics, causal agency, self-caused actions vs. control.

Self-determined action is characterized by three essential characteristics: volitional action, causal action, and action-control beliefs. These essential characteristics refer not to specific actions performed or the beliefs that drive action, but to the function the action serves for the individual; that is, whether the action enabled the person to act as a causal agent (Shogren et al., 2017).

The theorists of the Causal Agency Theory considered that this theoretical framework provides a foundation for developing and enhancing supports to enable youth to engage in agentic action through instruction in goal setting and attainment strategies, this will likely not only influence their agentic actions and causal agency, but also overall well-being.

*The self-determination of people with intellectual and developmental disabilities*

Wehmeyer and Abery (2013) examined the research findings related to self-determination status of people with intellectual disabilities. The first idea of their work referred to the fact that youth and adults with intellectual disabilities are less self-determined than their nondisabled peers. An important point to make regarding this finding, as borne out by subsequent research, was that this finding in no way speaks to the capacity of people with intellectual and developmental disabilities to become more self-determined. The literature clearly shows, for example, that people with intellectual and developmental disabilities have far fewer opportunities to make choices and express preferences in their lives (Stancliffe & Wehmeyer, 1995; Stancliffe, Abery & Smith, 2000) and that many people with intellectual disabilities who have the capacity to exercise control over their lives remain under substitute decision-making arrangements that tend to be permanent and often all too encompassing (Stancliffe, Abery et al., 2000).

The second finding indicated that youth and adults with intellectual disabilities can become more self-determined if given adequate supports (Wehmeyer & Abery, 2013). Recent research implementing randomized-trial control group studies has established causal evidence that adolescents with intellectual disabilities, when provided instruction to promote self-determination do become more self-determined (Palmer et al., 2012).

The third fact, research indicated the environmental and intra-individual factors contribute to or predict the self-determination of people with intellectual disabilities. There are a multitude of factors, both external and internal, that have the potential to either enhance or limit self-determination. Within-person variables clearly play a role in the development of self-determination. Studies utilizing regression analysis have found, for example, that people with intellectual disabilities who possess more well-developed social abilities and adaptive behavior and engage in lower levels of maladaptive behavior exercise higher levels of self-determination (Nota et al., 2007). Regarding to within factors, there has been a consistent relationship between self-determination and intelligence level, as measured by IQ scores. Stancliffe, Abery and their colleagues (2000) found that study participants with mild intellectual disabilities had higher self-determination scale scores. In the same framework, Nota and colleagues (2007) found a statistically significant relationship between measured self-determination and IQ scores, and in a large sample of people with intellectual and developmental disabilities. Furthermore, Wehmeyer and Garner (2003) found a correlation of  $r = .15$  between self-determination scores and IQ scores.

Fourthly, research demonstrated that enhanced self-determination results in more positive school, community, and quality of life outcomes for people with intellectual disabilities. Self-determination status has been linked, both correlational and causal, to more positive school and adult outcomes. Several

studies have established a relationship (e.g., correlational evidence) between adolescent self-determination status at the time of graduation from high school and more positive employment, independent living, and community inclusion-related outcomes (Wehmeyer & Palmer, 2003).

The fifth research finding provides efficacy evidence for interventions to promote self-determination. Data exist to support the efficacy of multiple interventions to promote student self-determination (Field & Hoffman, 2002; Shogren et al., 2012; Wehmeyer et al., 2012). Further, data exists to support the efficacy of several student-involvement in educational planning interventions as having a positive effect on self-determination and student involvement (Martin et al., 2006; Palmer et al., 2012; Wehmeyer et al., 2011). Many of these studies involve single-case design or quasi-experimental studies, though several more recent studies involve randomized trial control group studies.

#### *Evidence-based practices (EBPs) in self-determination area*

Agran and colleagues (2017) stated that evidence-based practices in special education refer to practices well supported by robust, empirical evidence, that can produce consistent and predictable learner outcomes, and suggest a causal or functional relation, that is, evidence to suggest experimental control and, in doing so, rule out alternative explanations of results. Furthermore, these practices have been rigorously tested and replicated across diverse groups. In short, such practices will improve outcomes, reduce the gap between research and practice, and eliminate ineffective or harmful practices (Cook & Odom, 2013). It is important to distinguish between practices that are not considered evidence-based because (a) they have been shown by multiple, high-quality research studies from which causality can be inferred to be ineffective and (b) an evidence-based review has not been conducted or there is insufficient research to conclusively determine whether the practice is effective (Cook et al., 2012). EBPs are typically, if not exclusively, identified on the basis of the collection and rigorous analysis of empirical evidence that uses a quantitative research methodology. However, Kozleski (2017) suggests the qualitative research approaches may also contribute much to a better understanding of EBPs. Like quantitative approaches, both are empirical and based on experience and observation. As the author suggests, qualitative research provides an invaluable approach to discover, understand, and produce evidence.

The Council for Exceptional Children (2014), in their statement regarding Standards for Evidence-Based Practices in special education, brought in discussion the criteria to be met for practice, program, therapy or intervention to be considered evidence-based practice in terms of effectiveness and efficacy. According to The Council for Exceptional Children (2014), the criteria for evidence-based classifications use the study as the unit of analysis. Studies are

considered only when they (a) use either a group comparison (e.g., randomized experiments, non-randomized quasi-experiments, regression discontinuity design) or single-subject research (e.g., reversal, multiple baselines, changing criterion, alternating treatment) designs, and (b) are categorized as methodologically sound. On the basis of the quantity, effects, and research design of methodologically sound studies reviewed, practices are classified in one of five categories: evidence-based practices, potentially evidence-based practices, mixed-effects, insufficient evidence, or negative effects.

### *Research questions*

The purpose of this study was to conduct a review of literature on evidence-based practices to promote overall self-determination and skills associated with self-determined actions and behaviors (i.e., choice-making, decision-making, problem-solving, goal setting and attainment, planning, self-management, self-advocacy, self-awareness, and self-knowledge) in students with intellectual disabilities. The following research questions guided the current literature review:

1. What evidence-based practices promoting self-determination have been implemented in the educational settings?
2. How were implemented the evidence-based practices intended to promote self-determination of students with intellectual disabilities?
3. What were the outcomes and the effects of the evidence-based practices designed to promote self-determination of students with intellectual disabilities?

## **Method**

This systematic literature review was conducted by following the PRISMA statement for reporting systematic reviews and meta-analyses (Liberati et al., 2009).

### **Inclusion Criteria**

There were five criteria for inclusion in this literature review. First, studies had to be published in English-language, peer-reviewed journals between 2000 and 2020. Second, study participants had to include students with intellectual disabilities (from severe, moderate to mild cognitive disabled conditions) enrolled in the educational system, and they had to be aged 3 to 21. Third, implementations of evidence-based practices were required to have occurred in the school context. Fourth, criteria and standards for evidence-based classifications had to be met; following these criteria, studies were considered eligible only when they use either a group comparison (e.g., randomized experiments, nonrandomized quasi-experiments, regression discontinuity design) or single-subject research (e.g., reversal, multiple baselines, changing criterion, alternating treatment) design.

Fifth, studies must have reported outcomes of an evidence-based practice intended to promote overall self-determination or one or more skills associated with self-determined actions, behaviors, and characteristics (choice-making, decision-making, problem-solving, goal setting and attainment, planning, self-observation, evaluation and reinforcement, internal locus of control, positive attributions of efficacy and outcome expectancy, self-management, self-advocacy, self-awareness, and self-knowledge).

### **Search Procedures**

To identify evidence-based practices studies, a systematic search process for peer-reviewed articles was conducted. First, electronic databases, including Education Resources Information Center (ERIC), PsycINFO, ProQuest, and ResearchGate were searched to collect articles published between 2000 and 2020. Search terms included one of the skills associated with self-determined action and behavior (i.e., choice-making, decision-making, problem-solving, goal setting and attainment, planning, self-management, self-advocacy, self-awareness, and self-knowledge), “intellectual disabilities” and “evidence-based practice” or “self-determination” combined with “intellectual disabilities” and “evidence-based practice”.

### **Article Selection**

The titles and abstracts of the search results were screened for inclusion based on their alignment with the inclusion criteria, and 54 were selected for an independent examination of the full-text records. After reviewing full-texts of the 54 identified articles, 38 articles were removed for the following reasons: not enrolled in the educational system (n = 4 articles), disability criteria were not met (n = 6), not a report of findings from implementation of evidence-based practices (n = 5 articles), not meeting standards and criteria for evidence-based practices classification (n = 9 articles); and not measuring overall self-determination or a skill associated with self-determined (n = 14 articles). As a result of this hierarchical approach, a number of 16 articles were included in this review (see Figure 1).

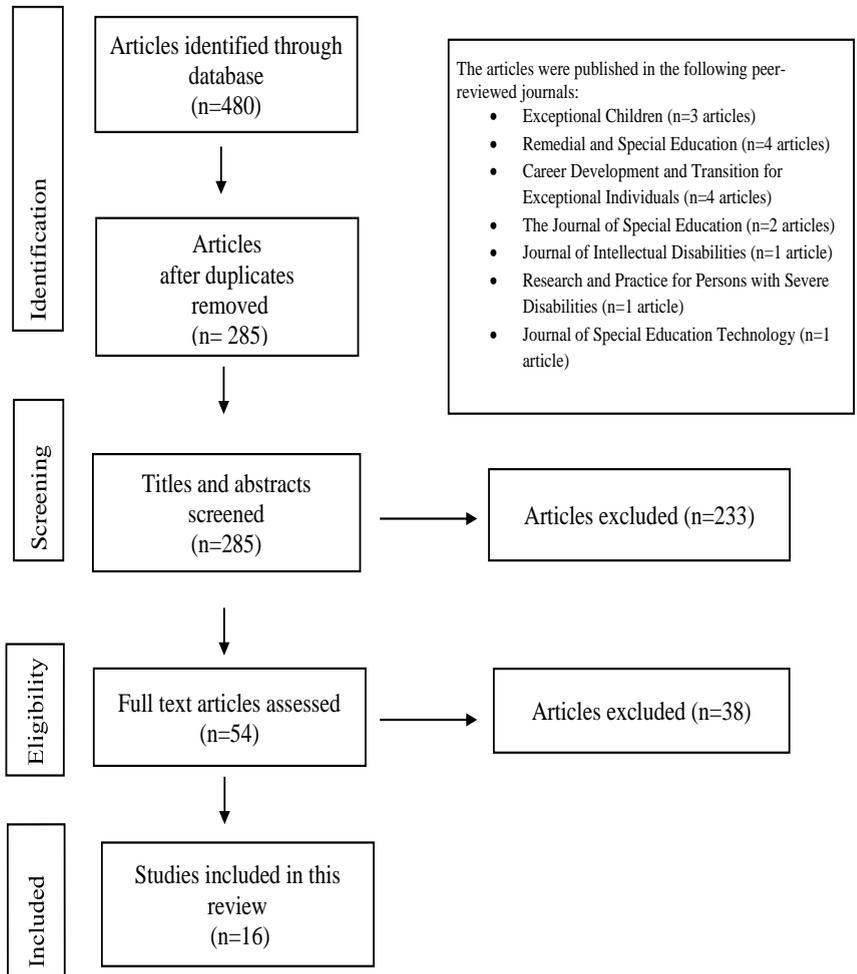


Figure 1. Search and article selection diagram

## Results

Main data of the obtained literature were summarized (see Table 1), and effect sizes were identified in each article of review for group design studies and single case design studies. Final analyses of the features of self-determination intervention research and obtained effect sizes represent outcomes presented below (see Table 2 and Table 3).

## Discussions

The aim of this literature review was to summarize and analyze the evidence-based practices (EBPs) that promote overall self-determination and skills associated with self-determined actions and behaviors for students with intellectual disabilities in the school context. The utilization of EBPs in educational settings is assumed to be a factor that can contribute to positive student outcomes by enabling teachers to systematically and regularly use effective models of instruction (Cook & Odom, 2013).

### **What evidence-based practices promoting self-determination have been implemented in the educational settings?**

A total of 16 articles published between 2000 and 2020 were identified to meet the search criteria. Most articles were published in 2018 ( $n = 4$  articles, 20%). Three articles were published between 2000 and 2010, respectively, 13 articles appeared between 2010 and 2020. Eleven of the studies total number used a randomized control group design with pretest–posttest, and five used a single-case multiple baseline design.

Research-based curricula include potentially evidence-based practices that promote self-determination in students with intellectual disabilities were applied in 3 studies (19%): Me!Curriculum in # 10 study (Mazzotti et al., 2018); Beyond High School in # 11 study (Palmer et al., 2012); and a combination of 5 practices and intervention models (ChoiceMaker Curriculum, Self-Advocacy Strategy, Steps to Self-Determination, Whose Future Is It Anyway?, The Self-Determined Learning Model of Instruction) in #16 study (Wehmeyer et al., 2013).

The combination of two research practices to promote self-determination in students with intellectual disabilities are reported in two articles (13%): Whose Future Is It Anyway? (Student-directed transition planning instruction) combined with Rocket Reader (a computer-based reading support program) in # 8 study (Lee et al., 2011); and Self-Determined Learning Model of Instruction combined with Whose Future Is It Anyway? in #13 study (Shogren, Burke, Anderson et al., 2018).

The single-independent research practices were reported in 11 articles (68%). The most frequently implemented were the Self-Determined Learning Model of Instruction ( $n = 4$ ), Self-directed IEP ( $n = 2$ ), Self-Advocacy Strategy ( $n=1$ ), Self-Advocacy and Conflict Resolution ( $n = 1$ ), Step to Self-Determination Curriculum ( $n=1$ ), Whose Future is it Anyway? ( $n = 1$ ), Go for It...Now! Strategy ( $n = 1$ ).

**Table 1.** Summary of main studies characteristics included in the review

Reference	Country and location setting	Study design, participants, and measures	Type of practice	Assessment and evaluation tools	Targeted skills associated with self-determination	Time- related aspects	Significant results and implications for effectiveness and efficiency
1.Arndt et al., (2006)	Southeast of USA high schools	multiple baseline design across behaviors Five high school students with intellectual disabilities	Self-Directed IEP	Student Intervention Rating Profile	Choice making Problem-solving Goal attaining Self-advocacy	Ten instructional lessons 45 minutes per session	Improving skills necessary to participate effectively in IEP planning meetings: choice making, problem solving, decision making, goal setting, self-advocacy, and leadership
2. Balint-Langel et al. (2020)	USA, urban middle school	Experimental pre- and posttest group design with random assignment of students to treatment and wait-list control groups 15 participants with mild and moderate ID	Self-Advocacy Strategy (SAS) computer-based strategy	ARC' self-determination scale AIR' self-determination scale (adolescent version) Self-Advocacy Self-Report	Self-advocacy, self-knowledge	Five instructional sessions across 2 weeks	Use of SAS to increase self-advocacy skills and teach active student participation in educational meetings
3. Field & Hoffman (2002)	USA Midwest High schools	Experimental-group design pre- and post-measure design	Step to Self-Determination Curriculum	Self-Determination Knowledge Scale Self-Determination Observational Checklist	Self-awareness Self-knowledge Goal setting and attaining	5 years	Increase in knowledge and behaviors associated with self-determination, locus of control Decrease in features associated with students' depression
4.Garrels & Palmer (2019)	Norway	Single-case experimental design study, eight adolescents with mild intellectual disability (ID)	Self-Determined Learning Model of Instruction	AIR-S-NOR and AIR-E-NOR, the Norwegian version of the student and teacher report of the AIR Self-Determination Scale	Overall Self-determination	3-month intervention	Increase academic achievement and the authors explore how this may lead to enhanced self-determination over time
5. Gregg et al. (2016)	USA, urban and rural high school	Experimental-group design	STEM coursework and enrolling in a virtual- mentoring program	Online survey for measurement of persistence	STEM persistence: self-determination, self-advocacy Math self-efficacy	4 years 10 sessions/ semester	Changes in Persistence construct significant improvement in both the self-determination and

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		189 students with moderate to mild disabilities			Science self-efficacy		self-advocacy and self-efficacy, aspirations
6. Holzberg et al. (2018)	USA suburban independent school	Multiple-probe-across-participants design four high school senior students with mild intellectual disabilities	Self- Advocacy and Conflict Resolution (SACR) instruction; 2 modules	Self-reported self-advocacy scale	Self-advocacy	14 lessons, 30 minutes each lesson	Self-advocacy to negotiate academic accommodations: functional relation between SACR instruction and students' ability to request and negotiate academic accommodations
7. Konrad et al. (2017)	The public, suburban high school in the Southeastern United States	Multiple-probe-across-participants design Five students with mild intellectual disabilities	GO for IT...NOW! Strategy	Self- management reported scale	Self-management	Fourteen 45-min scripted lessons delivered in a 1:1 format	Self-determination skills enhance academic achievement
8. Lee et al. (2011)	USA Middle schools	Pre- and post-measure design with 168 middle school students with disabilities who were assigned to an experimental group (n = 86) and control group (n = 82)	Whose Future Is It Anyway? (Student-directed transition planning instruction) combined with Rocket Reader	Arc's Self-Determination Scale, AIR Self-Determination Scale Whose Future Knowledge Scale Self- Efficacy and Outcome Expectancy for Educational Planning scale	Self-determination, self-efficacy	Unknown	Self-determination, self-efficacy, and outcome expectancy for educational planning
9. Martin et al. (2006)	USA High schools from 5 school districts of Oklahoma	Randomized-trial control group study design 130 students with intellectual disabilities 764 IEP team members	Self-Directed IEP intervention	Post-IEP meeting survey ChoiceMaker Self-Determination Assessment	Self-advocacy, choice making, and goal attaining skills	2 years	Increasing students' active participation in their IEP meetings; engaged in IEP leadership behaviors; expressed their interests, skills, and limits across transition areas

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10. Mazzotti et al. (2018)	Southeastern USA 7 high schools	Single-case research design seven high school students with specific learning disabilities (N=2) or intellectual disability (N=5) participating in Occupational Course of Study Program	ME! curriculum	ME! Scale	Self-advocacy and self-awareness skills	5 months	Increase participants' knowledge of the ME! content Ability to generalize this knowledge to untrained, authentic settings Increase level of self-awareness
11. Palmer et al. (2012)	USA high schools located in three states (Kansas, Missouri, and Texas) and 23 school districts	Pre- and post-measure design 109 high school students with intellectual disabilities	Beyond High School (BHS) multistage model, designed to infuse efforts to promote self-determination into quality 18–21 supports and to promote active student engagement	Arc's Self-Determination Scale	Self-direct planning and decision making specific to the transition process self-direct the transition goal setting, action planning, and program implementation process using the SDLMI	over 2 years	The benefits of direct instruction in self-determination, including choice and decision making, goal setting, problem-solving, self-monitoring, and self-regulation, are more evident
12. Seong et al. (2015)	USA 49 schools	Randomized-trial control group study design 131 girls, 207 boys (M=16,2 SD=1,28) with mild and moderate disabilities	Self-Directed Individualized Education Program instruction	Arc's Self-Determination Scale  Transition Empowerment Scale (TES)	Self-determination transition empowerment	5-year longitudinal study six to ten 45-min sessions utilizing 11 sequential lessons	The study provides causal evidence for the efficacy of the Self-Directed IEP instruction
13. Shogren, Burke, Anderson et al. (2018)	US, Rhode Islands high schools	Cluster randomized trial 340 transition-age students with disabilities: 205 males and 99 females	Differential impact of implementing the Self-Determined Learning Model of Instruction (SDLMI) alone and with implementing the SDLMI combined with Whose Future Is It?	Self-determination Inventory: Student-Report Self-determination Inventory: Parent/Teacher-Report Goal Attainment Scaling	Self-determination skills, transition skills	1 year	The study indicated causal relation between self-determination academic and transition achievement

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14. Shogren, Burke, Antosh et al., (2018).	21 school districts in Rhode Island, USA	Randomized-trial control group study design 184 youth with mild to severe/profound intellectual disability and approximately 40 special education teachers	Self-Determined Learning Model of Instruction (SDLMI) to support students to set individualized goals for learning leading to employment outcomes.	Self-Determination Inventory: Student-Report (SDI-SR). Self-Determination Inventory: Parent/Teacher Report (SDI-PTR) Transition Empowerment Scale Goal Attainment Scaling	Self-determination skills Goal attaining and transition skills	1 year	Analyze the outcomes of the first year of implementation of the SDLMI: Self-Determination and transition empowerment outcomes
15. Wehmeyer et al. (2012)	USA high schools	Group-randomized, modified equivalent control group time series design 312 high school students with intellectual disability	Self-Determined Learning Model of Instruction	Arc's Self-Determination Scale, AIR Self-Determination Scale	Self-determination	2 years	Provide causal evidence of the impact of intervention on student performance and self-determination
16. Wehmeyer, et al. (2013)	USA high schools	Randomized trial placebo control group study 371 high school students receiving special education services under the categorical areas of mental retardation or learning disabilities	ChoiceMaker Curriculum Self-Advocacy Strategy Steps to Self-Determination Whose Future Is It Anyway? NEXT S.T.E.P. Curriculum	Arc's Self-Determination Scale AIR Self-Determination Scale Criterion-referenced measures: Whose Future Is It Anyway? questionnaire Next S.T.E.P. Survey Self-Directed IEP survey	Impact of interventions to promote self-determination on student self-determination and postschool outcomes	5-year longitudinal study	Significant changes in student self-determination

There were 3 studies (19%) that used technology as part of the practice. Lee and colleagues (2011) used Rocket Reader, a computer-based program supporting students to self-efficacy in self-direct reading and, Gregg et al. (2016) developed a STEM coursework by enrolling students in a virtual-mentoring program, and Balint-Langel and colleagues (2020) implemented Self-Advocacy Strategy which is computer-based strategy.

The total number of participants in group design studies is 2.156, and the total number of participants in single-case design studies is 29. More details about participants' characteristics are specified for each study in Table 1.

### **How were implemented the evidence-based practices intended to promote self-determination of students with intellectual disabilities?**

Many of the research practices were implemented in segregated settings (special education classrooms), few studies were conducted in inclusive settings (general education classrooms). In several studies, researchers or project staff provided training on intervention strategies to natural implementation agents. In few cases, project staff and school personnel delivered the intervention together. Eleven studies (69%) reported the lengths of time of the entire research intervention, ranging from 2 weeks to 5 years. The most common length of time for a session was 30-45 minutes. The intervention sessions were delivered in 1:1 format or in small groups.

Analyzing targeted skills associated with self-determination, there are three research practices targeted one single skill associated with self-determined actions and behaviors: self-advocacy (Holzberg et al., 2018), persistence (Gregg et al., 2016) and self-management (Konrad et al., 2017). A number of 12 articles indicated multi-component practices implemented to multiple skills associated with self-determined actions and behaviors, and two articles referred to practice on overall self-determination (Garrels & Palmer, 2019; Wehmeyer et al., 2012). Individual self-advocacy, goal setting and attainment, self-awareness, problem-solving skills, and decision-making skills were among the most common intervention targets in group studies, whereas choice-making skills, problem-solving skills, and self-observation, evaluation, and reinforcement were most commonly targeted in single-subject studies.

Regarding assessment and evaluation of outcome variables, in 8 studies were measured changes in overall self-determination and associated skills using validated measurements instruments: The ARC's self-determination Scale, The AIR Self-determination Scale, Self-Determination Inventory: Student- Report (SDI-SR). In 5 studies the dependent variables (outcomes) were multiple self-determination skills, and to measure them were used the following instruments: Student Intervention Rating Profile (Arndt et al., 2006); Self-Determination Knowledge Scale and Self-Determination Observational Checklist (Field &

Hoffman, 2002); Whose Future Knowledge Scale and Self-Efficacy and Outcome Expectancy for Educational Planning scale (Lee et al., 2011); Choice Maker Self-Determination Assessment (Martin et al., 2006); ME! Scale (Mazzotti et al., 2018).

In 6 studies, a single skill associated with self-determination was measured using evaluation and assessment instruments: self-advocacy (measured by Self-reported self-advocacy scale in # 6 study, Holzberg et al., 2018); self-management (assessed with Self-management reported scale in # 7 study, Konrad et al., 2017), persistence (assessing through online survey for measurement of persistence in # 5 study, Gregg et al., 2016); goal attaining ( evaluation was made using Goal Attainment Scaling in # 13 study, Shogren, Burke, Anderson et al., 2018), and transition skills (measured by Transition Empowerment Scale in # 14 study, Shogren, Burke, Antosh et al., 2018).

In one study, the combined criterion-referenced measures were administrated: Whose Future Is It Anyway? Questionnaire, Next S.T.E.P. Survey, Self-Directed IEP survey (# 16 study, Wehmeyer et al., 2013).

### **What were the outcomes and the effects of evidence-based practices designed to promote self-determination of students with intellectual disabilities?**

The studies included in the current literature review reported positive outcomes in enhancing overall self-determinations and associated skills during of evidence-based practices implementation. To support this fact, Mazzotti and collegues (2018) indicated the results of their study were positive, they sustained continuing use of the ME! Curriculum by schools to teach self-advocacy and self-awareness knowledge and skills to youth with disabilities. The additional data collected add to the evidence base and provide additional confidence that the ME! curriculum is an effective way to teach these skills while students are enrolled in school, skills that predict future success as students move into adulthood.

The intervention practice with the “Whose Future Is It Anyway?” process results in enhanced self-determination, increased knowledge about transition planning, and improved self-efficacy and outcome expectations for educational planning (Lee et al., 2011).

Research has found the use of the Steps to Self-determination Curriculum resulted in an increase in knowledge and behaviors associated with self-determination, an increase of locus of control, and a decrease of features associated with depression (Field & Hoffman, 2002). Another efficient model reported is Beyond High School curriculum that effectively combines several evidence-based practices to support students with intellectual disabilities receiving special education services during the high school years. This model shows promise to help building individual capacity through direct and guided

instruction in setting and achieving goals and by enhancing the opportunities that must be available to students with intellectual disabilities on exit from high school (Palmer et al., 2012). The results from a randomized control and intervention group study combined with one quasi-experimental study, four single-subject design studies and the analysis of IEP documents study clearly demonstrate the Self-Directed IEP instructional package should be considered an evidence-based practice that results in more effective student participation in their middle and high school IEP meetings (Martin et al., 2006). Moreover, Seong and colleagues (2015) provided causal evidence for the efficacy of the Self-Directed IEP, which already has been identified as an evidence-based practice to enhance student involvement but extends those findings to examine the impact of the intervention on student self-determination and transition empowerment. Balint-Langel and colleagues (2020) provided additional empirical support for the use of the Self-Advocacy Strategy to increase self-advocacy skills and teach active student participation in educational meetings. Gregg and colleagues (2016) stated the findings from their study provide support for the effectiveness of virtual mentoring for enhancing the persistence of secondary and post-secondary students with disabilities. The significant improvement in students' perception of self-determination after participating in virtual-mentoring practices is a evidence that practice enhanced autonomous decision-making and goal setting for the secondary and post-secondary population with disabilities

In 2017, The Self-Determined Learning Model of Instruction (SDLMI) was established an evidence-based practice by National Technical Assistance Center on Transition, as evidenced by over a dozen quasi-experimental or single-subject design studies (Shogren, Burke, Antosh et al., 2018) and the large-scale, randomized control trial studies supported its efficacy (Wehmeyer et al., 2013). The SDLMI is a model of instruction designed to enable teachers to teach students self-regulated problem-solving in service of educational goals, and was first introduced in the early 2000s (Wehmeyer et al., 2000).

#### *Group design effect sizes*

Eleven group design studies included sufficient information for effect sizes calculations. Table 2 presents group design effect sizes and associated interpretations.

**Table 2.** Group Design Studies Effect Sizes

Article	Number of effect size	Effect size interpretation
Balint-Langel et al. (2020)	Cohen's d ranged from 0.029 to .087	Medium effect
Field & Hoffman (2002)	The effect of pretest and posttest treatment vs. control group of the effectiveness of the curriculum showed significant increase $p = .000$	Large effect
Gregg et al. (2016)	Math self-efficacy and valuing mathematics, significant improvement ( $p$ values $< .0001$ ). Self-efficacy in science interest, significant improvement in the majority sub-group ( $p$ value = .0016)	Large effect size
Lee et al. (2011)	WFA Knowledge Test (Cohen's $d = 0.43$ ), the self-efficacy assessment (Cohen's $d = 0.50$ ), and the outcome expectancy assessment (Cohen's $d = 0.36$ )	Small to moderate effect sizes
Martin et al. (2006)	Phi of .57 indicates a strong relationship between the Self-Directed IEP intervention and students meeting skills.	Large effect size
	The impact the Self-Directed IEP intervention: $p = .001$ , control $M=1.67$ , intervention $M= 2.05$ , Cohen's $d= .62$	Moderate effect size
	Self-Directed IEP intervention had upon students' view of the meeting behaviors, Cohen's $d= .71$	Strong effect size
Palmer et al. (2012)	Significant overall effect of time (Wilks's Lambda = 0.93; $F(1, 69) = 5.05$ , $p = .03$ ; partial $\eta^2 = .10$ ) with students showing a significant increase in their self-determination scores from baseline to post-intervention.	Significant effect size
	Significant main effect size was found for intellectual impairment level, $F(1, 69) = 14.83$ , $p < .001$ ; partial $\eta^2 = .18$ .	
Seong et al. (2015)	Significant main effect differences: (a) the between-subjects factor regarded as treatment group (placebo-control or the Self-Directed IEP group), Pillai's Trace = 0.03, $F(3, 333) = 3.47$ , $p < .05$ ; (b) the within-subjects effect regarded as time for the combined three dependent variables (SDS, AIR-S, and TES), Pillai's Trace = 0.03, $F(3, 333) = 3.58$ , $p < .05$ ; (c) a covariate of students' levels of intellectual capacity, Pillai's Trace = 0.07, $F(3, 333) = 8.46$ , $p < .05$ .	Large effect size
Shogren, Burke, Anderson et al. (2018)	Students overall scores: Baseline: 95% CI: [56.65, 63.79]; End of year: 95% CI: [64.93, 71.51]	Moderate effect size

Shogren, Burke, Antosh, et al. (2018)	SDI:SR—Overall score Baseline: 95% CI: [13.19, 14.17]; End of year: 95% CI: [13.16, 14.28]	
Wehmeyer et al. (2012)	The intervention group improved from .00 to .30 units on the AIR ( $d < .31$ ) and from .00 to .24 units on the SDS ( $d < .24$ ).  Chi-square difference tests revealed no between-group differences in self-determination as measured by the AIR.	Moderate effect size
Wehmeyer et al. (2013)	Significant overall increase in AIR-S scores over time, $F(1, 446) = 32.10, p < .0001$ , a significant intervention group effect, $F(1, 365) = 8.62, p < .005$ , and a significant intervention group by time interaction, $F(1, 446) = 6.70, p = .01$ .	Moderate to large effect size

*Single-case design effect sizes*

Four out five single-case studies reported some available data as p value and difference of means scores (see Table 3). Tau-U was not specified and uncalculated.

**Table 3. Single-Case Design Studies Effect Sizes**

Article	Tau-U	P value
Garrels & Palmer (2019)	Not specified	$p = 0.017$ , with a large effect size ( $r = 0.598$ )
Arndt et al. (2006)	Not specified	Not specified
Holzberg et al. (2018), Palmer & Roessler (2000)	Not specified	Positive effect size: treatment group behavior scores: $M = 8.83$ ( $SD = 2.22$ ), control group scores: $M = 3.87$ ( $SD = 1.78$ ), $F(11, 38) = 60.93, p < .0001$
Konrad et al. (2017)	Not specified	Mean student scores ranged from 3.5 to 4, indicating high levels of student satisfaction with procedures and outcomes.
Mazzotti et al. (2018)	Not specified	Positive effect size. Difference in mean scores between pre- and post-test were statistically significant ( $p = .002$ ).

According to The Council for Exceptional Children (2014), studies must demonstrate that data analysis is conducted appropriately and reports information on effect size.

Data analysis techniques of those 11 group design studies seem to be appropriate for comparing changes in the performance of two or more groups. Four single-case design studies provide single-subject graphs clearly representing outcome data across study phases for each unit of analysis and traditional visual analysis techniques. Studies included in this review reported one or more appropriate effect size statistics (Cohen’s  $d$  was identified in some studies) for all relevant outcomes.

## Conclusion

Since Algozzine colleagues (2001) and Burke and colleagues (2020) analyzed the literature on interventions and practices to promote self-determination there has been ongoing development. Over the last years, self-determination has expanded in numerous ways both in the literature and in practice including theory, research, and practice. In addition to a better understanding of self-determination, researchers have contributed to the literature regarding interventions to support students with disabilities. However, there is an ongoing need to attend to issues that impact the quality of self-determination research, including methodological soundness and reporting, and challenges associated with conducting school-based research. Overall, however, practitioners can support students by incorporating evidence-based self-determination instruction for students with disabilities in general and special education settings to enhance their academic achievement, life skills, and transition planning for a high quality of life.

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