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Effects of Self-Monitoring on the Self-Determination of Students with Intellectual and Developmental Disabilities in a Post-Secondary Educational Setting

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EFFECTS OF SELF-MONITORING ON THE SELF-DETERMINATION OF STUDENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES IN A POST-SECONDARY EDUCATIONAL SETTING

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ABSTRACT

Increased self-determination skills are critical in improving life outcomes for individuals with intellectual or developmental disabilities (IDD). The recent growth of post-secondary education settings for those with IDD have provided an additional setting in which self-determination skills should be taught. Using a multiple-baseline single case research design, the researcher examined a self-determination choice-making curriculum along with the use of a self-monitoring checklist to increase self-determination skills for individuals with IDD who attend a post-secondary educational setting. Data were analyzed using visual analysis and repeated measures ANOVAS. Results indicated that the overall points exceeding the median (PEM) of the intervention was 0.70, indicating a moderate effect. Standardized measurements indicated mixed results. Implications for practice and future research are provided.

DEDICATION

This manuscript is dedicated to my parents, David and Sharon Smith, who instilled a love of learning and the belief that knowledge is one of the greatest treasures available. I will forever be grateful for the love, support, and encouragement to fulfill my dreams of earning my doctorate.

"We can make our plans,
but the LORD determines our steps."
-Proverbs 16:9

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CHAPTER I: INTRODUCTION

Individuals with intellectual or developmental disabilities (IDD) compromise approximately 4.8% of the United States' population (Kraus et al., 2018). The Individuals with Disabilities Education Improvement Act (IDEA) of 2004 defines an intellectual disability as the following:

> c.)(6). Significantly subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child's educational performance. (2004).

The definition provided by IDEA is similar to the current definition used by the American Association on Intellectual and Developmental Disabilities (AAIDD), the oldest and largest organization of individuals concerned about IDD:

> A disability characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18. (AAMR Ad Hoc Committee on Terminology and Classification, 2010, p. 1).

Recent findings have identified 6.9% of children (417,373) aged 5-21 who are served under special education are classified as having an intellectual disability (U.S. Department of Education, 2018).

While characteristics of IDD can vary greatly among individuals, those with IDD generally have deficits in intellectual functioning and adaptive behaviors. Intellectual functioning deficits typically manifest as learning problems related to attention, memory, language development and comprehension, self-regulation, social development, motivation, and metacognition (Alloway, 2010; Heward, 2009). Individuals with IDD typically have deficits in

social intelligence and practical intelligence, both of which make up adaptive behavior. Social intelligence includes adaptive behaviors such as being able to read people and their emotions, social interactions, and not being gullible. Practical intelligence involves being able to solve everyday problems (e.g., preparing meals, using transportation systems, using the internet; Schalock et al., 2010).

Post-School Outcomes

Unfortunately, post-school outcomes for individuals with IDD can be very bleak. The National Association of State Directors of Developmental Disabilities Services and the Human Services Research Institute work together to gather performance and outcome measures of individuals with disabilities. The findings are known as National Core Indicators. The National Core Indicators 2016-2017 reported that only 17% of individuals with IDD live independently (i.e., their own home or apartment; Human Services Research Institute [HSRI], 2018). Employment statistics for those in the IDD population do not fare much better. Among all of the disability categories, IDD has the lowest employment rate with around 19% reporting having a paid community job (HSRI, 2018). Individuals employed made a bi-weekly gross wage of between $169.59 and $287.49 (HSRI, 2018), in comparison to the typical median weekly earnings of $936 made by US workers (U.S. Department of Labor, 2020). Only 27% of individuals with IDD who have paid employment also receive paid time off (HSRI, 2018). While life outcomes can be dismal, much research has been put into investigating ways to increase life outcomes for individuals with IDD. One evidence-based method that has demonstrated success for improving the lives of individuals with IDD is increasing an individual's self-determination (SD) (Wehmeyer & Palmer, 2003; Wehmeyer & Schwartz, 1998).

What is Self-Determination?

Personal SD emerged in the 1940s along with the field of personality psychology. Angyal (1941) postulated that personality was made of two essential elements which determined an individual's behavior, one of which was autonomous determination (or self-determination). An essential feature of an organism is its autonomy, which means governed from inside (Angyal, 1941). The importance of SD for individuals with disabilities garnered researchers' attention when Nirje (1972) wrote a chapter in Wolfensberger's (1972) text focused on the principle of normalization. A key point of normalization is that individuals with disabilities experience "normal" to the same extent as any non-disabled individual would be entitled. Choices, wishes, desires, and aspirations of individuals with disabilities need to be taken into consideration regarding decisions affecting them. Nirje (1972) went on to identify the features of SD including choice-making, asserting oneself, self-management, self-knowledge, decision-making, self-advocacy, self-efficacy, self-regulation, autonomy, and independence.

Our conceptualization of SD is extremely important, as it sets the foundations of our beliefs regarding how and why people assume control over their lives and their future (Wehmeyer, 1998). Different theories conceptualize and define SD differently, such as empowerment (Nirje, 1972), internal motivation (Deci & Ryan, 1987), character trait, or even a legal right. As Wehmeyer (1998) carefully explains, our conceptualization of SD determines how SD should be promoted, taught, or protected. For example, if we believe that SD is only a personality trait or internal motivation, then not much can be done to increase or promote SD skills. Alternatively, if we conceptualize SD as a legally protected right, efforts may focus on making certain legal protections are in place and that laws are being followed. Instead, if we think of SD as only a principle or value, there is no law to safeguard and endeavors to promote SD will concentrate on educating people, altering attitudes, values, and systems.

One way to think of SD is as a basic right or freedom to which all human beings are entitled. Nirje (1972) argues that if SD is considered a basic human right or ideal, even though it may not be covered by law, it is what society's rules/laws are based on (Nirje, 1972). The theoretical framework that is the conceptualization above is based on the principal belief that SD is a "dispositional characteristic of individuals" (Wehmeyer, 1998; Wehmeyer et al., 1996). For the purposes of this paper the concept of SD as a dispositional characteristic of individuals, is based on Wehmeyer's (1998) definition which includes: (a) providing individuals with adequate opportunities to be the causal agent in their lives, make choices, and learn SD skills; (b) enabling individuals to maximally participate in their lives and communities; and (c) ensuring that supports and accommodations are in place.

Self-Determination Subdomains

An individual's SD can be assessed by identifying and measuring behavior (e.g., choosing a preferred activity) or lack of behavior (e.g., deciding to not go to an activity) that is believed to show self-determined or self-determining behaviors. Wehmeyer and colleagues proposed four essential characteristics of self-determined behavior, including (1) autonomy, (2) self-regulation, (3) psychological empowerment, and (4) self-realization (Wehmeyer et al., 1996; Wehmeyer, 1997; Wehmeyer, 1998).

Autonomy

Individuals displaying autonomous behaviors may act in ways that correspond with their own preferences, abilities, or interests, and independently or free from excessive external pressure (Deci & Ryan, 1987; Wehmeyer, 1997). Behavioral autonomy can be placed into the following categories (Sigafoos et al., 1988): (a) self and family care activities, (b) self-management activities, (c) recreational activities, and (d) social or vocational activities. Self and

family care include activities such as grocery shopping, completing household chores, and personal care. The extent that an individual interacts independently with events in their environment, such as using community resources or completing a personal responsibility, require self-management autonomy. Participating in recreation activities does not necessarily show autonomy in and of itself, but does show behavioral autonomy if the individual uses personal interests and preferences to participate in such activities if they choose. Similarly, social involvement and/or vocational activities show autonomous behaviors when they include the individual's personal preferences and interests.

Self-Regulation

Behaviors that are self-regulated are considered to show SD. The act of self-regulation can be defined as "a complex response system that allows individuals to examine their environments and their repertoires of responses for coping with those environments to make decisions about how to act, to act, to evaluate the desirability of the outcomes of the action, and to revise their plans as necessary" Whitman (1990 p. 373). Examples of self-regulated behaviors include self-management strategies (self-monitoring, self-evaluation, self-instruction), goal setting and attainment strategies, problem-solving behaviors, and "observational" learning strategies (Agran, 1997).

Psychological Empowerment

People initiating and responding to events in a psychologically empowered manner demonstrate SD. When people act in a way that displays psychological empowerment it is with the belief that they: (1) have control over things that matter to them; (2) possess the skills needed to achieve anticipated outcomes; and (3) choose to use those skills, then the desired outcomes will be achieved (Wehmeyer, 1997; Zimmerman, 1990, 1995). Zimmerman (1990) included the

following actions as means that an individual can display psychological empowerment, such as participating in collective action, developing skills, and being culturally aware. Empowerment does not mean that an individual always makes the correct choice, but that they know that they can choose whether they argue their point or concede, hurry or arrive late, take the lead or wait to follow (Zimmerman, 1990).

Self-Realization

When people act in a self-realizing, or self-aware manner, they demonstrate SD. Self-realization requires an individual to have a good understanding of themselves including their strengths and limitations, and then act in such a way as to capitalize on that knowledge (Wehmeyer et al., 1996; Wehmeyer, 1997). Self-realization includes having this self-knowledge and self-understanding. Self-knowledge develops through experience with and understanding of an individual's environment, and can be affected through evaluating others, reinforcements, and causes of specific behavior (Wehmeyer & Garner, 2003).

Life Outcomes

SD is essential for improved quality of life for individuals with disabilities. Research has shown that there is a direct correlation between SD skills and quality of life for individuals with IDD (Wehmeyer & Palmer, 2003). That is, the higher the SD skills in an individual with IDD, the higher their quality of life (Wehmeyer & Schwartz, 1998). Additionally, individuals with IDD and high SD skills are significantly more likely to live independently, have financial independence, and maintain better jobs (Wehmeyer & Palmer, 2003).

Self-Determination Skills Evidence Base

Over the past 25 years much effort, time, research, and funds have gone into developing and implementing various strategies to increase SD skills in individuals with IDD. Starting in

1989, with three subsequent periods over the following four years, large federal grants were awarded to institutions (e.g., higher education institutions, local education agencies, private nonprofit institutions or agencies) to develop model projects with the intention of identifying SD skills and ways to develop SD skills (Harmon et al., 1994). In particular, emphasis was placed on identifying activities that "foster assertiveness, creativity, self-advocacy, and other skills associated with self-determination" (Harmon et al., 1994). During this time period, nearly $3,000,000 in funds were distributed to 26 projects. Many SD curriculums and programs came out of these projects resulting in a greater understanding regarding the impact that SD skills have on individuals with disabilities, including those with IDD. The increase in SD programming and interventions led to increased research examining the impact of the interventions on both SD skills and life outcomes for individuals with IDD.

Post-School Outcomes

Several studies have examined how SD skills impact post-school outcomes. SD skills have been linked to the achievement of more positive academic and transition outcomes (Wehmeyer et al., 2013). SD interventions in secondary school may lead to more stability in student outcomes over time (Shogren et al., 2015). An individual with IDD's SD status upon exiting high school predicts positive outcomes of achieving employment and community access after one year of leaving school (Shogren et al., 2015). Additionally, research has indicated that students with higher SD skills fared better post-high school in the areas of employment, health and other benefits, financial independence, and independent living (Shogren & Shaw, 2016; Wehmeyer & Palmer, 2003). Nota et al., (2007) found that individuals with IDD who had higher SD had higher social abilities.

Quality of Life

Merriam-Webster (2019) defines quality of life as "the happiness, independence and freedom available to an individual". Individuals with IDD have been shown to have a higher quality of life and experience higher levels of life satisfaction when they have higher SD skills (Schalock, 2005; Shogren et al., 2015; Wehmeyer & Schwartz, 1998). International studies of individuals with IDD have also found that generally individuals with higher SD report better quality of lives as well (Lachapelle et al., 2005). Individuals who identify as being more self-determined have been shown to have higher levels of self-management and autonomy (Shogren & Shaw, 2016; Wehmeyer & Schwartz, 1998). Additionally, students who have higher SD skills are not only more independent but also considerably more likely to be making more money at their job (Wehmeyer & Palmer, 2003). SD skills play a significant role in an individual's ability to live independently and be competitively employed (Shogren et al., 2015).

Independent Living

Shogren and Shaw (2016) reported that individuals with IDD who have higher SD skills in the subdomain of autonomy are more likely to live in inclusive residential settings (i.e., live independently or with non-disabled peers). Wehmeyer and Palmer (2003) examined longitudinal data for individuals with IDD three years after completion of high school. The individuals with IDD had been split into two groups prior to exiting high school: those with high SD skills and those with low SD skills. Data revealed that the group with high SD skills were significantly more likely to live independently and to not live where they lived in high school, in comparison to students with lower SD skills (Shogren et al., 2015; Wehmeyer & Palmer, 2003). Additionally, Wehmeyer and Palmer (2003) found that students in the high SD group were more likely to maintain a bank account by their first year after leaving high school, and had greater financial independence by year three.

Competitive Employment

SD skills greatly impact competitive employment status of individuals with IDD. Students with high SD skills were found to be statistically more likely to hold a job either full or part time one year following completion of high school (Wehmeyer & Palmer, 2003). Additionally, those individuals with higher SD skills were more likely to have held a job or received job training three years after leaving high school (Wehmeyer & Palmer, 2003). A previous study by Wehmeyer and Schwartz (1998) found that students who earned the most income had significantly higher SD scores. Additionally, findings by the Wehmeyer and Palmer (2003) follow-up study, found that students with high SD post-school also received increased job benefits (e.g., vacation time, health insurance).

Self-Determination Instruction in School Settings

As several recent reviews have found, SD is commonly taught in middle school and high school settings (Lee et al., 2015; Raley et al., 2018). However, SD skills impact individuals with disabilities across all age spans. Thus, it is of great importance to continue to focus instruction on increasing SD skills in individuals with disabilities regardless of their age or setting. This concept is also supported by the 1998 reauthorization of the Rehabilitation Act which states that "disability is natural part of the human experience and in no way diminishes a person's right to: (a) live independently, (b) enjoy SD, (c) make choices, (d) contribute to society, (e) pursue meaningful careers, and (f) enjoy full inclusion and integration in the economic, political, social, cultural, and educational mainstream of American society" (Rehabilitation Act of 1973, as amended).

Postsecondary Education Programs

PSE programs are educational settings intended for individuals with disabilities to receive education and training past high school instruction to improve life outcomes for individuals with IDD (PSE; Grigal et al., 2012; Marcotte et al., 2005). PSE programs for students with IDD have been operating since the early 1970s (Neubert et al., 2001), and currently 293 PSE programs exist (www.thinkcollege.net). Enrollment in any PSE program by individuals with IDD tripled from 8.4% in 1990, to 28.1% in 2005 (Newman et al., 2010). While PSE programs can vary vastly regarding the types of courses and services offered, they provide opportunities for SD instruction to be incorporated. The impact that SD has on the quality of life and life outcomes of individuals with IDD has been well established in the literature (Shogren et al., 2015; Shogren & Shaw, 2016; Wehmeyer & Palmer, 2003; Wehmeyer & Schwartz, 1998). However, as more and more individuals with IDD are attending postsecondary educational (PSE) programs (Hart et al., 2010), it is critical to investigate the types of SD interventions that are being incorporated into these settings, and to examine the impact those interventions have on the SD of individuals with IDD.

CHAPTER II: REVIEW OF THE LITERATURE

As several reviews have found, self-determination (SD) is commonly taught in middle school and high school settings (Lee et al., 2015; Raley et al., 2018). However, SD skills impact individuals with disabilities across all age spans. Thus, it is of great importance to continue to focus instruction on increasing SD skills in individuals with disabilities regardless of their age or setting. This concept is also supported by the 1998 reauthorization of the Rehabilitation Act which states that "disability is natural part of the human experience and in no way diminishes a person's right to: (a) live independently, (b) enjoy self-determination, (c) make choices, (d) contribute to society, (e) pursue meaningful careers, and (f) enjoy full inclusion and integration in the economic, political, social, cultural, and educational mainstream of American society" (Rehabilitation Act of 1973, as amended).

While increased SD skills are required for more successful post-school outcomes (Wehmeyer & Palmer, 2003), they also are valuable for individuals with IDD who are enrolled in postsecondary educational (PSE) programs. PSE programs are educational settings intended for individuals with disabilities to receive education and training past high school. PSE programs for students with IDD have been operating since early 1970s (Neubert et al., 2001). PSE programs are often found on university or college campuses, and currently 293 such PSE programs exist (www.thinkcollege.net). As more and more students with IDD are finding that college is an opportunity to extend their education, another setting is established to further SD skill development.

As more and more students with IDD are finding that college is a very real opportunity to extend their education, another setting is established to further SD skill development. While increased SD skills are required for more successful post-school outcomes (Wehmeyer &

Palmer, 2003), they also are valuable for individuals with IDD who are enrolled in postsecondary educational (PSE) programs.

Systematic Review of Existing Literature

PSE programs have grown from 25 in 2004, to currently over 288 PSE (https://thinkcollege.net) resulting in an increasing number of individuals with IDD are attending PSE programs (Hart et al., 2010), it is critical to investigate the types and efficacy of SD interventions that are being incorporated into these settings. The subsequent systematic review is guided by the following objectives; (a) the extent to which research into SD programs in postsecondary settings been implemented and studied; (b) participant characteristics, identification, IQ, and setting; (c) measurements used and research design; and (d) intervention components and subsequent participant outcomes.

Method

Eligibility Criteria

A comprehensive search was conducted in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) standards (Moher et al., 2009) in order to locate all relevant studies targeting the impact of self-determination programs for post-secondary education students. The following procedures were used to locate articles through a multiple-step process, including an electronic search, hand search, ancestral review, and forward search.

Electronic Search

First, an electronic search was conducted using all 112 databases available through Education Research Complete. Databases which returned articles can be found in Figure 1. A complete list of the 112 databases can be provided upon request. Search criteria included peer-reviewed manuscripts that were available in English, with no date requirements, however articles

were only found during the time period of 1982 to 2019. The following Boolean phrase was used to search the aforementioned databases for articles: (Goal* or Goal Attainment or self-determination or autonomy or self-regulat* or psychological* empower* or self-realiz*) AND (intellectual disability or mental retardation or developmental disability or cognitive impairment) AND (curricul* or intervent* or program) AND (study or empirical or research) AND (post-secondary education or post secondary education or college or university or universities). After all duplicates were removed, the electronic article search included a total of 1,776 articles (see Figure 1).

Gray Literature

In the search for gray literature, OpenDissertations and Networked Digital Library of Theses and Dissertations databases were used. Gray literature was limited to doctoral dissertations only. The search returned a total of six dissertations that met initial search criteria.

Hand Search

Multiple articles from the initial electronic search were published in the *Education and training in Mental Retardation and Developmental Disabilities*, *Career Development for Exceptional Individuals,* and the *Career Development and Transition for Exceptional Individuals* journals. As a result, a hand-search of these journals was performed in order to locate additional studies on self-determination program. After conducting the hand search, eight additional articles were located that met the initial search criteria.

Ancestral Review

Ancestral reviews were conducted with articles referenced in literature reviews as well as the reference sections of articles that met the criteria for inclusion in the review. These searches yielded four studies that were included in the initial screening.

Forward search

Finally, a forward search was conducted by entering studies that met inclusion criteria into the Web of Science database to locate other relevant works that cited each of the accepted 20 articles. Five additional articles found during the forward search process met the inclusionary criteria.

Study Selection

The initial selection of studies began by a doctoral graduate student screening the title and abstracts of each article. Studies considered for initial inclusion in the review encompassed peer-reviewed articles that included programs, curriculum, or interventions for post-secondary education students with intellectual disabilities that focused on increasing self-determination or one of its component skills (e.g., autonomy, self-regulation). Studies were initially excluded if they: (a) were not curricula, interventions, or programs; (b) used an elementary or middle school sample; or (c) were recommendations or program development that did not provide supporting empirical evidence. Using these inclusionary and exclusionary criteria, our initial search yielded 65 potential studies. Each of these articles was then read in full by one researcher to determine which met inclusionary criteria. To be included in this review, studies had to meet the following five conditions:

1. The independent variable (IV) of the study was a type of intervention or program aimed at increasing student self-determination behaviors and was implemented by researchers, teachers, or individual schools. IVs had varying components (e.g., digital, researcher or teacher-led) and varying lengths of implementation.

2. Studies had to measure self-determination behaviors as the dependent variable (DV). DV behaviors included autonomy, psychological empowerment, self-regulation, or self-realization. DVs had to be measured and reported at the beginning and conclusion of the IV.

3. Studies had to include participants with intellectual or developmental disabilities (IQs < 70) that were either of high-school or college age (18-25 years of age). Sample must include at least one participant aged 18-25 years, or for studies providing only the mean age of participants, mean age must be between 18-25 years of age.

4. Studies specified quantitative, single case research designs (SCRD), or mixed-methods statistical analyses regarding the impact of the IV on the DVs.

5. Studies were peer-reviewed and published in English. Dissertations were also considered for inclusion if they met the previous inclusion criteria and were available in English.

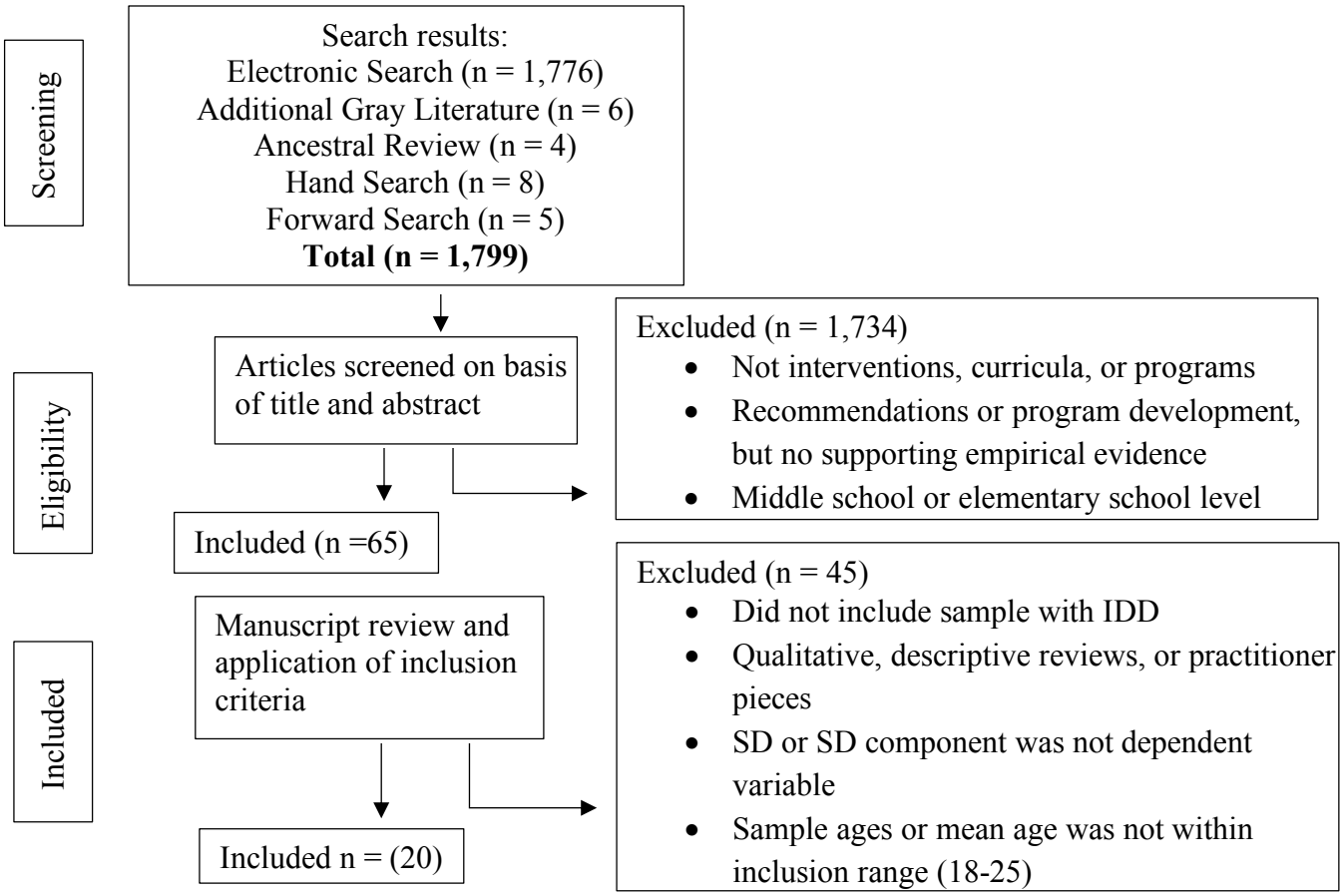
In all, 20 articles met the inclusionary criteria (9 initial search, 1 grey literature, 7 hand search, 2 ancestral search, 1 forward search). Figure 2.1 a Prisma Flow-Chart outlines the selection process at each phase starting with the electronic search and ending with the studies that met the inclusion criteria.

Coding Procedures

A predesigned coding sheet provided the framework for organizing relevant information from the studies. Included on the coding sheet were data regarding: (a) participants (i.e., number in study, age or grade, disability type(s), IQ level); (b) study design (i.e., research design, design type, dependent measures, treatment focus); (c) conditions (i.e., setting, length, frequency, total sessions, duration); (d) intervention components (i.e., curricula name, types of lessons, instructional focus); (e) results (i.e., mean, standard deviation, effect size, p values); and (f) implications and future research.

Figure 2.1

Literature Search Prisma Flow-Chart



Note. For a complete list of all 112 databases searched, please contact the author. Studies were included in the initial search in the following databases: Academic Search Premier, Academic Search Alumni Edition, PsycINFO, Education Research Complete, Psychology and Behavioral Sciences Collection, Health Source: Nursing/Academic Edition, Professional Development Collection, Education Full Text (H.W. Wilson), SocINDEX with Full Text, MasterFILE Premier, SPORTDiscus, ERIC, Business Source Alumni Edition, Business Source Complete, Business Source Premier, Teacher Reference Center, Criminal Justice Abstracts with Full Text, Social Sciences Full Text (H. W. Wilson), Vocational and Career Collection, Health Source – Consumer Edition, CINAHL Plus with Full Text, PsycARTICLES, Family Studies Abstracts, Communication & Mass Media Complete, Associates Programs Source, General Science Full Text (H.W. Wilson), Library, Information Science & Technology Abstracts with Full Text, Music Index, Biological & Agricultural Index Plus (H.W. Wilson), Index to Legal Periodicals & Books Full Text (H.W. Wilson), LGBT Life with Full Text, GreenFILE, Humanities International Index, International Security & Counter Terrorism Reference Center, Library Literature & Information Science Full Text (H.W. Wilson), MAS Ultra – School Edition, Political Science Complete, Humanities Source, Art Full Text (H.W. Wilson, Computer Source, FSTA – Food Science and Technology Abstracts, Hospitality & Tourism Complete, Urban Studies Abstract.

Quality Indicators

The Council for Exceptional Children (CEC) has determined standards for evidence-based practices in special education research, from which Cook and colleagues (2015) developed a set of essential quality indicators (QI). These QIs were used to evaluate the quality of the 20 included studies. Twenty-four (group design) indicators were used to measure eight areas, including: (a) context and setting, (b) participants (c) intervention agent (d) description of practice, (e) implementation fidelity, (f) internal validity, (g) outcome measures, and (h) data analysis.

Results

Participant Characteristics and Settings

Age

Studies met the inclusion criteria for this review if their sample included at least one participant aged 18-25, or mean age of participants were between 18-25. However, included manuscript samples consisted of participants from a wide range of ages; e.g., Shogren and colleagues (2018) used a sample that included participants ranging from 10 to 21 years of age, whereas Wehmeyer et al., (2003) sample included participants aged 22 to 50 years old. Three (15%) studies included only participants who were between the ages of 18 and 25, while the remaining studies had a wide range of participant ages. Five (25%) studies included participants who were 18 years of age or younger. Twelve (60%) studies included participants who were 22 years of age or younger, with three (15%) studies utilizing participants up to 50 years of age. Overall study characteristics can be found in Table 2.1 SD Program Characteristics.

Identification or IQ

While inclusionary criteria required included manuscripts to utilize samples including participants with IDD, studies varied on the level of IDD, while many did not provide any IQ information. Eleven (55%) studies did not provide IQ of participants or levels of IDD. While the remaining nine (45%) studies provided IQ and IDD levels for their participants; one (5%) study included only participants with mild ID, five (25%) utilized participants with either mild or moderate ID, two (10%) studies included participants with moderate ID, while one (5%) study utilized participants with either moderate or severe ID. Additionally, twelve (60%) studies used samples that strictly used participants with IDD, while eight (40%) studies had samples that included participants with a variety of disabilities.

Settings

When examining the included studies, the instructional settings fell into two areas: educational settings (e.g., high school or college) or an outside agency (e.g., day center, vocational rehabilitation). Fourteen (70%) of the studies took place at educational settings, with three (15%) studies being conducted at an outside agency. One (5%) study was completed at both an educational setting and an outside setting (e.g., half of the participants were enrolled in high school, while the other half attended a vocational rehabilitation day center). Two (10%) studies included interventions that occurred at PSE settings. The first by Cook, Wilczenski, and Vanderberg (2017) focused on participants who attended high school, but audited one post-secondary course per semester. Another study by Wehmeyer and colleagues (2006) included participants aged 18 to 21 who participated in community college courses. See Table 2.1 SD Program Characteristics for full study demographic characteristics.

Table 2.1

SD Program Characteristics

Author	Setting	Participant Ages (Range)	Sample Size	Classification (Percentage of Inclusion Sample if Applicable)
Allen et al. (2001)	High School	15-21	4	Moderate ID
Cook et al. (2017)	PSE	18-21	9	Severe cognitive and/or learning disability
Cross et al. (1999)	High School	14-20	10	Mild and moderate ID
Diegelmann & Test (2018)	High School	14-18	4	Mild ID
German et al. (2000)	High School	16-18	6	Mild and moderate ID
Kartasidou et al. (2009)	Outside Agency	19-33	4	Mild and moderate ID
Kramer et al. (2018)	Combination – High School & Outside Agency	Mean age 17.6 years (SD 2 years)	82	Mild and moderate ID (46%)
Luber (2018)	High School	16-19	21	IDD
Martin et al. (2006)	High School	12-18+	130	ID (8.5%)
McGlashing-Johnson et al. (2004)	High School	16-20	4	Moderate and severe ID

Author	Setting	Participant Ages	Sample Size	Classification (Percentage of Inclusion Sample if Applicable)
Miller et al. (2015)	High School	14-19	3	Moderate ID
Nittrouer et al. (2016)	Outside Agency	22-29	3	ID (66.7%)
Palmer et al. (2012)	High School	17.2-21.8	109	ID
Seong et al. (2015)	High School	14.3-21.8	338	ID (17.5%)
Sheppard & Unswort (2011)	High School	11-18	31	Mild and moderate ID
Shogren et al. (2018)	High School	10-21	340	ID
Wehmeyer et al. (2003)	Outside Agency	22-50	5	Developmental Disability (20%)
Wehmeyer et al. (2006)	PSE	18-21	15	ID (87%)
Wehmeyer et al. (2011a)	High School	18-21	493	ID (27%)
Wehmeyer et al. (2011b)	High School	14-20	94	ID (31%)

Note. *Classifications reported as provided in corresponding manuscripts; SDLMI - Self-Determined Learning Model of Instruction

Research Design

The empirical studies that met the inclusion criteria employed a variety of research methodologies and designs. All studies and their research design can be found in Figure 2, in Appendix A. A mixed methods research design was utilized in one (5%) study incorporating both quantitative and qualitative data (e.g., sequential explanatory design). Five (25%) studies used a randomized control-trial design. Seven (35%) studies used quasi-experimental research designs (e.g., pre-post- test design). Seven (35%) studies used a single case research design (SCRD; e.g., multiple baseline across participants).

Dependent Measurements

A large variety of dependent measures were used in the included studies, please see Table 2.2 Overview of SD Curriculum. Most of the included manuscripts (80%; 16 studies) utilized more than one dependent measure. Measures could be separated into two categories: researcher created and standardized assessments. Researcher-created dependent measures included probes used in SCRD studies (7; 35%), and researcher-created interviews and questionnaires (6; 30%). The Arc's Self-Determination Scale (Wehmeyer & Kelchner, 1995), a global measure, was used by nine (45%) studies, while both the AIR Self-Determination Scale (Wolman et al., 1994) and the Goal Attainment Scaling (Kiresuk et al., 1994) were each used in five (25%) studies. Four (20%) studies used assessments that were particular to the intervention (e.g., ChoiceMaker Self-Determination Assessment; Whose Future Is It Anyway – Knowledge Test).

Intervention Components

Many programs, curricula, and strategies are being used to increase self-determination in students with IDD. Interventions reported in the studies fell into several categories: (a) packaged

programs or curriculum, (b) SD strategies, or (c) combinations of packaged curriculum and SD strategies. See Table 2.2 SD Overview of SD Curriculum.

Packaged Curriculum

Sixteen (60%) of the studies used a packaged curriculum to increase SD skills in students with IDD. Five package curriculums were utilized in more than one study. *Beyond High School* (Wehmeyer et al., 2006) was used in two studies. *Whose Future Is It Anyway?* (Wehmeyer et al., 2004) and *Whose Future Is It?* (Wehmeyer & Palmer, 2011) were utilized in three studies. The *Self-Determined Learning Model of Instruction* (SDLMI; Wehmeyer et al., 2000) was used in five studies. The *ChoiceMaker* self-determination curriculum includes 5 various curriculums (e.g. *Choosing Employment Goals; Self-Directed IEP*; Huber Marshall et al., 1999; Marshall et al, 1996; Martin & Marshall, 1995) and was utilized in seven studies. Five different SD packaged curriculums were each used once in four (20%) studies. See Table 2.2 Overview of SD Curriculum for complete list of packaged programs.

Strategies

One (5%; Cook et al., 2017) study utilized inclusive general courses taken at a college or university following an established inclusive course of study. While students had choice regarding the individual course(s) they took, there was a set course of study (e.g., participants enrolled in 10 credit hours of their choice per semester, and spent time with an inclusion mentor). Three (15%; Miller et al., 2015; Nittrouer et al., 2016; Sheppard & Unswort, 2011;) studies did not use a packaged curriculum, and used various strategies to increase SD skills. Strategies used include guided inquiry, self-monitoring tools, person-centered planning, goal setting, prompting, and task analysis.

Combinations

Three (15%) studies (Diegelman & Test, 2018; McGlashing-Johnson et al., 2004; Wehmeyer et al., 2011b) used a package curriculum (e.g., *ChoiceMaker, the Self-Determined Learning Model of Instruction*) and added a SD strategy (e.g., self-monitoring checklist, technology respectively) to the intervention.

Table 2.2

Overview of SD Curriculum

Author	Dependent Measures	Approach	Name of Intervention	Focus
Allen et al. (2001)	Checklist Probe*	Classroom Taught as an additional course	ChoiceMaker: Self-Directed IEP (Marshall et al., 1996)	IEP/transition procedures
Cook et al. (2017)	Adolescent Self-Determination Assessment Interviews	Combination – Classroom & Individual Full inclusion (no SD instruction)	ICE (inclusive concurrent enrollment program)	Full inclusion
Cross et al. (1999)	The Arc's Self-Determination Scale ChoiceMaker Self-Determination Assessment Interviews Student participation in IEP meetings (frequency data)	Classroom Taught as an additional course	MAPS (the McGill Action Planning System); ChoiceMaker (Choosing Employment Goals; Martin et al., 1996)	Goal attainment and IEP/Transition Procedures
Diegelmann & Test (2018)	IEP Steps Probe* Social validity data (questionnaire)	Individual	ChoiceMaker: Self-Directed IEP (Martin et al., 1996) along with a self-monitoring checklist	IEP/transition procedures and Self-monitoring

Author	Dependent Measures	Approach	Name of Intervention	
German et al. (2000)	Goal Probe*	Classroom Taught as an additional course	ChoiceMaker: Take Action: Making Goals Happen (Huber Marshall et al., 1999).	Goal attainment
Kartasidou et al. (2009)	The Arc's Self-Determination Scale	Classroom Integrated into existing curricula	Autonomy Domain of SDMLI (Wehmeyer et al., 2000)	Problem solving
Kramer et al. (2018)	Project TEAM Test AIR Self-Determination Scale Revised disability self-efficacy scale Goal Attainment Scaling	Combination – Classroom & Individual	Project TEAM (Teens making Environment and Activity Modifications)	Goal attainment and problem solving
Luber (2018)	The Arc's Self-Determination Scale Adolescent Knowledge of Concepts Scale	Classroom Taught as an additional course	PEER-DM (Peers Engaged in Effective Relationships-Decision Making; Khemka & Hickson, 2013)	Problem solving
Martin et al. (2006)	IEP Participation (frequency data) Post-meeting surveys for student and adult ChoiceMaker assessment	Classroom Taught as an additional course	ChoiceMaker: Self-Directed IEP (Martin et al., 1996)	IEP/transition procedures

Author	Dependent Measures	Approach	Name of Intervention	
McGlashing-Johnson et al. (2004)	Task analysis Probe* Goal Attainment Scaling Social validity questionnaire	Individual Integrated into existing curricula	SDLMI (Wehmeyer et al., 2000) and Self-Monitoring Card	Self-monitoring and goal attainment
Miller et al. (2015)	Problem-solving and guided science inquiry steps Probe*	Classroom Taught as an additional course	Guided science inquiry (Bybee et al., 2006) and self-monitoring checklists	Problem solving and self-monitoring
Nittrouer et al. (2016)	On-task behavior Probe* Social validity questionnaire	Individual	Person-Centered Employment Planning and Goal Setting; Self-Management Tool	Goal attainment and self-monitoring
Palmer et al. (2012)	The Arc's Self-Determination Scale	Combination – Classroom & Individual	Beyond High School (Wehmeyer et al., 2006)	Goal attainment and IEP/transition procedures
Seong et al. (2015)	The Arc's Self-Determination Scale AIR Self-Determination Scale Transition Empowerment Scale	Classroom Taught as an additional course	ChoiceMaker: Self-Directed IEP (Martin et al., 1996)	IEP/transition procedures

Author	Dependent Measures	Approach	Name of Intervention	
Sheppard & Unswort (2011)	Assessment of Motor and Process Skills Goal Attainment Scaling Social Skills Rating System AIR Self-Determination Scale	Combination – Classroom & Individual Taught as an additional course	ERU – Education Residential Unit (Prompting Hierarchy & Task Analysis)	Goal attainment and self-monitoring
Shogren et al. (2018)	Self-Determination Inventory: Student-Report & Parent/Teacher-Report Goal Attainment Scaling	Combination – Classroom & Individual Integrated into existing curricula Taught as an additional course	SDLMI (Wehmeyer et al., 2000) & Whose Future Is It? (Wehmeyer & Palmer, 2011)	Goal attainment
Wehmeyer et al. (2003)	The Arc's Self-Determination Scale Student self-report measure Probe* Questionnaire	Individual	Self-Determined Career Development Model (Wehmeyer, 2003)	Goal attainment and problem solving
Wehmeyer et al. (2006)	Goal Attainment Scaling The Arc's Self-Determination Scale Autonomous Functioning Checklist	Combination – Classroom & Individual Taught as an additional course	SDLMI (Wehmeyer et al., 2000) and Beyond High School (Wehmeyer et al., 2006)	Goal attainment and IEP/transition process

Author	Dependent Measures	Approach	Name of Intervention	
Wehmeyer et al. (2011a)	The Arc's Self-Determination Scale The AIR Self-Determination Scale Whose Future Is It Anyway – Knowledge Test	Classroom	Whose Future Is It Anyway? (Wehmeyer et al., 2004)	IEP/transition procedures
Wehmeyer et al. (2011b)	The Arc's Self-Determination Scale The AIR Self-Determination Scale The Transition Empowerment Scale	Classroom Taught as an additional course	Technology Components Whose Future Is It Anyway? (Wehmeyer et al., 2004); NEXT Step; Self-Directed IEP, and the Self-Advocacy Strategy	IEP/transition procedures

Note. Probe* designates SCRD studies that used a researcher created or modified probe to collect dependent measure data.

Program Focus

While the studies used a variety of programs and curricula to teach SD skills, overall intervention focus could be placed into five categories including: goal attainment, IEP/transition procedures, problem solving, self-monitoring, and full inclusion. While half of the studies used a single intervention focus, the remaining half used a combination of two instructional practices including: (a) goal attainment and IEP/transition procedures, (b) goal attainment and problem solving, (c) goal attainment and self-monitoring, (d) IEP/transition procedures and self-monitoring, and (e) problem solving and self-monitoring.

For studies that utilized a single intervention approach, the approach that was used the most often to increase SD skills was that of IEP/transition procedures. Five (25%) studies used IEP/transition procedures as their approach for increasing SD skills. The intervention approach focusing on increasing goal attainment was used in two (10%) studies. Problem-solving was the program focus in two (10%) studies, while full inclusion was the focus for one (5%) study. No studies used only self-monitoring as an intervention approach.

The remaining studies used a combination of two intervention approaches. Three (15%) studies used the intervention approaches of goal attainment and IEP/transition procedures, while three (15%) other studies used goal attainment and self-monitoring to increase participant SD skills. Two (10%) studies used both goal attainment and problem solving to increase SD skills. One (5%) study incorporated IEP/transition procedures and self-monitoring, and another (5%) study used both problem solving and self-monitoring to increase SD skills in participants.

Participant Outcomes

Many studies reported significant findings to support effectiveness of interventions to support the increase of SD skills in individuals with IDD. Two (10%) group studies did not

report significance testing, however the remaining ten (50%) all provided various statistical analysis with corresponding significant findings. Additionally, several studies provided effect sizes (e.g., Cohen's *d*, *r*) that ranged from small effects to large effects. While, it is not the purpose of this review to calculate effect size for all included studies, studies can be grouped according to intervention focus, and gauged on effectiveness according to author(s) narrative results statements. Following recommendations from Parker, VanNest, and Brown (2009) IRD was calculated using a calculator found at singlecaseresearch.org for all included SCRD manuscripts. PND (percentage of nonoverlapping data) was calculated for each included SCRD study as well using effect size recommendations from Scruggs and Mastropieri (1998). PEM (percentage of data points exceeding the median) was calculated as well. Studies, statistical analyses, dependent measures, and corresponding results can be found in Table 2.3 Participant Outcomes.

IEP/Transition Procedures

Three (15%; Allen et al., 2001; Seong et al., 2015; Wehmeyer et al., 2011a) of the five studies that focused on IEP/transition procedures reported significant differences between either intervention and control participants' scores or pre- and post-intervention scores. Narrative results from the studies provide support for the intervention for increasing participants' knowledge, skills, and involvement in IEP/transition procedures. For the remaining two (Martin et al., 2006; Wehmeyer et al., 2011b) studies reported strong evidence between the intervention and participant involvement in the transition process.

Goal Attainment

Two (10%) studies focused on the intervention approach of goal attainment. The group study (Shogren et al., 2018) reported significant increases in SD scores from baseline to end-of-

the-year scores for participants, and teachers reported that teachers saw student goal attainment as being predictive of change in SD skills. The SCRD study (German, 2000) reported that 100% of their participants learned to attain their daily goals and maintained these skills. IRD was calculated to be 0.5839, indicating a moderate effect.

Problem Solving

Two (10%; Kartasidou et al., 2009; Luber, 2018) studies focused on using problem solving as the intervention approach. Luber (2018) reported that participants in the intervention group had significantly higher scores on the dependent measure in the domains of psychological empowerment and self-realization in comparison to the control group. Kartasidou and colleagues (2009) conducted a quasi-experimental small group study, which resulted in an increase in overall autonomy scores for two of their four participants.

Full Inclusion

Only one (5%; Cook et al., 2017) study used the approach of full inclusion to increase participant SD skills. The researchers found that students who participated for at least two semesters in the inclusive PSE program demonstrated significant growth in SD skills. However, no significant growth in SD skills was found for participants who participated in only one semester.

Goal Attainment and IEP/Transition Procedures

Three (15%; Cross et al., 1999; Palmer et al., 2012; Wehmeyer et al., 2006) studies incorporated the use of goal attainment and IEP/transition procedures into their intervention. Cross and researchers (1999) compared *MAPS* (the McGill Action Planning System) and *ChoiceMaker* interventions. They found that the *ChoiceMaker* curriculum increased student and teacher self-determination ratings, with Cohen's d effect sizes ranging from moderate to high in

the four components of SD, whereas MAPS had a small if any effect on the four SD components. Palmer and colleagues (2012) focused on the Beyond High School (Wehmeyer et al., 2006) using both goal attainment and IEP/transition procedures. Researchers reported significant changes in participant SD scores from baseline to postintervention. The final study (Wehmeyer et al., 2006) reported that their participants achieved both educationally relevant goals as well has enhanced perceptions of autonomy.

Goal Attainment and Self-Monitoring

Three (15%) studies focused on using intervention approaches of goal attainment and self-monitoring (e.g., self-monitoring checklist, task-analysis board). One (Sheppard & Unsworth, 2011) reported large effect sizes in the area of goal attainment for self and family care and recreation/leisure areas, however vocational/social skills did not result in the same level of improvement. One SCRD (McGlashing-Johnson et al., 2004) study found that three of four participants achieved their self-selected goals using a self-monitoring task-analysis chart, and the student who did meet mastery criteria performed at a higher level after the intervention than at baseline. Overall, the IRD for this study was 0.6012, indicating a moderate-size effect. The third (Nittrouer et al., 2016) study was also a SCRD which resulted in an IRD of 0.30, indicating a very small or questionable effect.

Goal Attainment and Problem Solving

Two (10%) studies used interventions that included goal attainment and problem-solving approaches. The first (Kramer et al., 2018) found that participants in the intervention Project TEAM made significant improvements in knowledge, problem-solving, and SD. Additionally, significantly more participants in the intervention group attained their goals by follow-up in comparison to a control group. The second (Wehmeyer, Lattimore et al., 2003) was a SCRD

study focused on goal attainment and problem solving using the Self-Determined Career Development Model (Wehmeyer, 2003). Five out of six participants made progress toward their goal, with an IRD of 0.75, indicating a large effect. Additionally, participants indicated they were satisfied with the process.

IEP/Transition Procedures and Self-Monitoring

One (Diegelmann & Test, 2018) SCRD study utilized the intervention approach of incorporating a self-monitoring checklist into an IEP/transition curriculum (i.e., ChoiceMaker). One participant met mastery criteria at the conclusion of the IEP/transition procedure intervention. The remaining three participants only met mastery criteria once the self-monitoring checklist was introduced. IRD was calculated for this intervention approach, and resulted in a 0.86, indicating a very large effect.

Problem Solving and Self-Monitoring

The intervention approach of problem solving and self-monitoring was used in one (Miller et al., 2015) SCRD study. Researchers found that participants increased autonomy in completing science content activities. All three participants continued to trend upwards following the intervention and through follow-up phases. Using a self-monitoring checklist in addition to guided science inquiry methods resulted in an IRD of 0.528, indicating a moderate-sized effect.

Table 2.3

Participant Outcomes

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results
Allen et al. (2001) Wilcoxon matched-pairs signed-ranks tests; Z-value	Indicated a functional relationship between the modified Self-Directed IEP package and an increase in student participation in their IEP meetings. Statistical significance increases from pre- to post-training IEP meetings for all skills.	Leading Meeting Reporting Interests Reporting Skills Reporting Options Total Score	1.89* 1.84* 1.89* 1.89* 1.89*
Cook et al. (2017) Non-parametric Friedman and Wilcoxon signed-rank tests	Students who participated for at least 2 semesters demonstrated growth in SD, no significant growth was observed in those who participated in one semester.	Adolescent Self-Determination Assessment – Short Form Pre-semester 1 to Post semester 1 Pre-semester 1, Post semester 1, to Exit Effect size of mean differences	 NS NS ranged from $r = .77$ to $r = .94$

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results	
Cross et al. (1999) ANOVAS	Results favored the *ChoiceMaker* curriculum on student and teacher self-determination ratings and in terms of efficiency instruction.	Arc's Self-Determination Scale	ChoiceMaker	Maps
		Self-Determination Total Score	*d = 1.00*	*d = 0.30*
		Autonomy	*d = 0.74*	*d = 0.28*
		Self-Regulation	*d = 0.56*	*d = 0.08*
		Psychological Empowerment	*d = 2.28*	*d = 0.06*
		Self-Realization	*d = 0.44*	*d = 0.21*
		ChoiceMaker Self-Determination Assessment		
		Choosing Goals (Student Skills)	*d = 0.28*	*d = 0.26*
		Choosing Goals (Opportunity)	*d = 2.54*	*d = 0.78*
		Expressing Goals (Student Skills)	*d = 0.23*	*d = 0.14*
		Expressing Goals (Opportunity)	*d = 0.39*	*d = 0.86*
		Taking Action (Student Skills)	*d = 0.39*	*d = 0.23*
		Taking Action (Opportunity)	*d = 3.22*	*d = 3.74*

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results		
Kartasidou et al. (2009) Percentage	2 of 4 participants increased overall autonomy scores.		Student #1	Initial	Final
		Routine and Personal Care		67%	83%
		Recreational and Leisure Time		83%	94%
		Community Involvement and Interaction		27%	60%
		Total Autonomy Score		57%	78%
			Student #2	Initial	Final
		Routine and Personal Care		50%	56%
		Recreational and Leisure Time		72%	50%
		Community Involvement and Interaction		33%	33%
		Total Autonomy Score		50%	42%
			Student #3	Initial	Final
		Routine and Personal Care		56%	67%
		Recreational and Leisure Time		72%	72%
		Community Involvement and Interaction		47%	40%
		Total Autonomy Score		57%	55%
			Student #4	Initial	Final
		Routine and Personal Care		17%	17%
		Recreational and Leisure Time		6%	39%
		Community Involvement and Interaction		0%	13%
		Total Autonomy Score		12%	20%

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results
Kramer et al. (2018) Independent *t*-tests; χ^2-square tests; non-parametric equivalents	Project TEAM participants achieved significant improvements in knowledge, problem-solving, and SD, increases in parent reported SD remained at follow-up. Significantly more Project TEAM members attained their participation goals by follow-up.	Initial to Outcome: Project TEAM Test Part I: Knowledge Part II: Problem-solving AIR Self-Determination Participants Parent Disability related self-efficacy Outcome to Follow-up: Project TEAM Test Part I: Knowledge Part II: Problem-solving AIR Self-Determination Participants Parent Disability related self-efficacy Goal Attainment Scaling T Apply knowledge during participation in everyday life Attainment of participant goal Goal attainment at follow-up	 $p < 0.001$* $p < 0.008$* $p < 0.216$ $p < 0.012$* $p < 0.915$ $p < 0.001$* $p < 0.001$ $p < 1.000$ $p < 0.001$* $p < 0.996$ $p < 0.001$* NS $p < 0.009$*

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results
Luber (2018) Independent samples *t*-test	Participants who received the intervention had significantly higher scores on the subscales of psychological empowerment and self-realization then the control group.	Group Differences The Arc's Self-Determination Scale Autonomy Self-Regulation Psychological Empowerment Self-Realization Total score Adolescent Knowledge of Concepts Scale Self-Determination Subset	 NS NS NS NS $p < 0.021$* $p < 0.029$*
Martin et al. (2006) Chi-square test; independent *t* test; repeated-measures ANOVAs	The Self-Directed IEP had a strong effect on increasing the percentage of time students talked, started, and led IEP meetings.	Intervention Group vs. Control Group Students starting their IEP meeting Students leading their IEP meeting Length of IEP meeting Students talking during IEP meeting Teachers talking during IEP meetings ChoiceMaker Self-Determination Assessment Choosing Goals (Student Skills) Expressing Goals (Student Skills) Taking Action (Student Skills) Choosing Goals (Opportunity) Expressing Goals (Opportunity) Taking Action (Opportunity)	 Phi = .57 (strong relationship) Phi = .35 (moderate relationship) NS $\eta^2 = .15$ (strong relationship); $d = 1.40$ $\eta^2 = .031$ (small relationship) $\eta^2 = .54$ (strong relationship) $\eta^2 = .66$ (strong relationship) $\eta^2 = .06$ (moderate relationship) $\eta^2 = .45$ (strong relationship) $\eta^2 = .82$ (strong relationship) $\eta^2 = .81$ (strong relationship)
Palmer et al. (2012) Mixed-factor ANOVA	There was a significant change in student SD scores from baseline to postintervention, and this change was offset by initial differences based on intellectual	The Arc Self-Determination Scale Effect of time Effect for intellectual impairment level Effects of gender	 Partial $\eta^2 = .10$ Partial $\eta^2 = .18$ NS

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results	
	impairment level, with students with mild ID demonstrating higher initial scores.			
Seong et al. (2015) Repeated-measures MANCOVA; univariate ANCOVA	Instruction using the Self-Directed IEP was significant on students' level of SD, and positive differences were found in transition knowledge when compared to a placebo-control group.	Self-Directed IEP vs. control group		
		Treatment Group	$p < 0.05$*	
		Time	$p < 0.05$*	
		Level of intellectual capacity	$p < 0.05$*	
		Time by Level of intellectual capacity	$p < 0.236$	
		Time by Treatment	$p < 0.053$	
		The Arc's Self-Determination Scale		
		Time	$\eta^2 = 0.02$*	
		Treatment Group	$\eta^2 = 0.02$*	
		Level of intellectual capacity	$\eta^2 = 0.04$*	
		AIR-S Self-Determination Scale		
		Time	$\eta^2 = 0.00$	
		Treatment Group	$\eta^2 = 0.00$	
		Level of intellectual capacity	$\eta^2 = 0.00$	
		Transition Empowerment Scale		
		Time	$\eta^2 = 0.00$	
		Treatment Group	$\eta^2 = 0.03$*	
		Level of intellectual capacity	$\eta^2 = 0.00$	
Sheppard & Unsworth (2011) Wilcoxon's Signed Rank Test	Participant skills in self & family care and recreation/leisure improved significantly with large effect sizes at post program and	Baseline to Post-program		
		Assessment of Motor and Process Skills		
		Motor Skills	$p < .001$*	$r = .59$ (large effect)
		Process Skills	$p < .001$*	$r = .60$ (large effect)
		Goal Attainment Scales		
		Recreation and Leisure	$p < .001$*	$r = .76$ (large effect)

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results	
	follow-up, skills for social/vocational skills did not show the same level of improvement, but participant- rated SD scores improved significantly with small effect size at post program and moderate effect at follow-up.	Overall	$p < .000$*	$r = .56$ (large effect)
		Social Skills Rating Scales		
		Teacher	$p < .09$	$r = .21$ (small effect)
		Parent	$p < .25$	$r = .19$ (small effect)
		Participant	$p < .83$	$r = .03$ (small effect)
		AIR Self-Determination Scale Capacity		
		Teacher	$p < .001$*	$r = .45$ (moderate effect)
		Parent	$p < .09$	$r = .30$ (moderate effect)
		Participant	$p < .015$*	$r = .32$ (moderate effect)
		AIR Self-Determination Scale Opportunity		
		Teacher	$p < .18$	$r = .17$ (small effect)
		Parent	$p < .17$	$r = .24$ (small effect)
		Participant	$p < .23$	$r = .16$ (small effect
		AIR Self-Determination Scale Overall	$p < .045$*	$r = .26$ (small effect)
		Baseline to Follow-up		
		Assessment of Motor and Process Skills		
		Motor Skills	$p < .001$*	$r = .59$ (large effect)
		Process Skills	$p < .001$*	$r = .58$ (large effect)
		Goal Attainment Scales		
		Recreation and Leisure	$p < .001$*	$r = .72$ (large effect)
		Overall	$p < .000$*	$r = .49$ (moderate effect)
		Social Skills Rating Scales		
		Teacher	$p < .024$*	$r = .29$ (small effect)
		Parent	$p < .028$*	$r = .38$ (moderate effect)
		Participant	$p < .76$	$r = .04$ (small effect)
		AIR Self-Determination Scale Capacity		
		Teacher	$p < .001$*	$r = .46$ (moderate effect)
		Parent	$p < .005$*	$r = .55$ (large effect)
		Participant	$p < .002$*	$r = .41$ (moderate effect)
		AIR Self-Determination Scale Opportunity		

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results	
		Teacher	$p < .24$	$r = .15$ (small effect)
		Parent	$p < .02$*	$r = .46$ (moderate effect)
		Participant	$p < .019$*	$r = .32$ (moderate effect)
		AIR Self-Determination Scale Overall	$p < .000$*	$r = .47$ (moderate effect)
Shogren et al. (2018) Raw Scores	Results suggest that students in the SDLMI-only group reported significant increases in their SD scores from baseline to end of the year, and teachers saw students' goal attainment as predicting change in SD over the course of the year. Teachers reported significant changes in student SD in the SDLMI & Whose Future Is It group.	Student Self-Determination Inventory: Self-Report	Baseline μ	End of Year μ
		Overall score	60.22	68.22
		Volitional action	60.15	67.84
		Agentic action	56.92	65.04
		Action-control beliefs	63.62	71.76
		Teacher Self-Determination Inventory: Parent/Teacher-Report		
		Overall score	47.69	55.36
		Volitional action	49.56	57.89
		Agentic action	40.02	48.91
		Action-control beliefs	53.50	59.26

Author(s) Inferential Statistic Type	Author Provided Narrative Results	Dependent Variable	Results
Wehmeyer et al. (2011a) Repeated measures ANCOVA	The intervention resulted in significant, positive differences in SD when compared with a placebo-control group and that participants who received the intervention gained transition knowledge and skills.	AIR-Student Self-Determination Scale	
		Time	$p < 0.007$*
		Time by Age Group	NS
		The Arc's Self-Determination Scale	
		Time	NS
		Time by Age Group	NS
		Whose Future Knowledge and Skills Assessment	$p < 0.001$*
		Time	$p < 0.001$*
		Time by Age Group	
Wehmeyer et al. (2011b) Repeated Measures ANCOVA	Results provided support for the relationship between student involvement in transition planning and enhanced SD, and provided evidence of a causal relationship between student involvement combined with technology use and enhanced SD.	The Arc's Self-Determination Scale	
		Time	$p < 0.03$*
		Time by Intervention	$p < 0.05$*
		AIR Self-Determination Scale	
		Time	NS
		Time by Intervention	$p < 0.01$*
		Transition Empowerment Scale	
		Time	NS
		Time by Intervention	NS

Note. * Denotes statistical significance

Single Case Research Design Studies					
Author Probe	Author Provided Narrative Results	Phases	IRD	PEM	PND
Dieglemann & Test (2018) Knowledge of IEP Steps	3 of 4 students only met mastery criteria once the self-monitoring checklist was introduced.	Baseline Phase 1: Intervention Phase 2: Intervention with Checklist Phase 3: Booster Session Maintenance Overall	0.86	0.71 1.0 1.0 0.75 0.86	0.79 1.0 1.0 0.75 0.89
German et al. (2000) Daily goals completed	6 of 6 students learned to attain their own daily goals and maintained these skills following withdraw of teacher instruction.	Baseline Intervention Withdrawal Overall	0.5839	0.81 1.0 0.91	0.67 0.98 0.83
McGlashing-Johnson et al. (2004) Correct steps on a task analysis: Work behavior	3 of 4 participants achieved their self-selected goals, 1 student did not meet mastery criteria, but performed at a higher level during the training than at baseline.	Baseline Phase 1: Training Maintenance Overall	0.6012	0.97 1.0 0.99	1.0 1.0 1.0
Miller et al. (2015) Percent of independence: Guided science inquiry steps and inquiry problem-solving steps	Following intervention students increased their autonomy in completing inquiry problem-solving activities linked to science content.	Baseline Intervention Generalization Maintenance Overall	0.528	0.92 1.0 1.0 0.97	0.92 1.0 1.0 0.97

Author Probe	Author Provided Narrative Results	Phases	IRD	PEM	PND
Nittrouer et al. (2016) Percentage of on-task work behaviors	The process can lead to meaningful change in on task and job completion behavior.	Baseline Goal-Setting Self-Management Maintenance Overall	 0.30	 0.48 1.0 1.0 0.83	 .00†
Wehmeyer et al. (2003) Implementation of action plan to attain goal	5 out of 6 participants made progress toward their goal, and indicated satisfaction with the process.	Baseline Intervention Overall	 0.75	 0.78	 0.80

Note. † Ceiling Effect resulting in PND being nonreliable.

Quality Indicators

All included studies and their QIs can be found in Table 2.4 Council for Exceptional Children Quality Indicators. Following the recommendations of Cook and colleagues (2015) included studies were evaluated using CEC's Quality Indicators. Twenty (100%) of the studies included the indicators for adequately describing the study context and setting. Description of participants including their disability or risk status was provided for 17 (85%) of the included studies. Ten (50%) studies included both sufficient descriptions of the intervention agent and the training that was involved, while all 20 (100%) studies provided detailed descriptions of the practice and study materials. Nine (45%) studies completely met all three indicators used to evaluate implementation fidelity of the practice. Internal validity has six QIs focused on the research design; nine (45%) studies included all six indicators, while six (30%) studies included four or five indicators for this QI. Six indicators for group design studies or five indicators for SCRD studies are used to evaluate outcome measures as well; seven (35%) studies included all six indicators (five group studies and two SCRD). Data analysis is the last QI measured, and includes two indicators for group designs and one indicator for SCR designs. In total, 12 (60%) studies met this QI; 7 (35%) studies were group design and five (25%) were SCR design. To be considered an acceptable study, approximately 90% of the indicators should be met. One study (Diegelmann & Test, 2018) met 100% of the QIs, while seven (35%) studies met 90% or more of the QIs. On average, studies met 18.4 QIs; resulting in either am77% for a group design study or an 84% for SCRD.

Table 2.4

Council for Exceptional Children Quality Indicators

Author	Quality Indicators								Total QIs Met (%)
	QI-1	QI-2	QI-3	QI-4	QI-5	QI-6	QI-7	QI-8	
Allen et al. (2001)	1/1	2/2	1/2	2/2	1/3	4/6	4/6	2/2	17 (71%)
Cook et al. (2017)	1/1	2/2	1/2	2/2	0/3	2/6	5/6	1/2	14 (58%)
Cross et al. (1999)	1/1	2/2	0/2	2/2	3/3	4/6	5/6	2/2	19 (79%)
Diegelmann & Test (2018)	1/1	2/2	2/2	2/2	3/3	6/6	5/5	1/1	22* (100%)
German et al. (2000)	1/1	2/2	1/2	2/2	3/3	6/6	4/5	1/1	20* (91%)
Kartasidou et al. (2009)	1/1	1/2	1/2	2/2	0/3	3/6	4/6	0/2	12 (50%)
Kramer et al. (2018)	1/1	2/2	2/2	2/2	3/3	6/6	6/6	1/2	23 (96%)
Luber (2018)	1/1	2/2	1/2	2/2	2/3	6/6	6/6	2/2	22 (92%)
Martin et al. (2006)	1/1	1/2	1/2	2/2	3/3	6/6	6/6	2/2	22 (92%)
McGlashing-Johnson et al. (2004)	1/1	2/2	1/2	2/2	3/3	6/6	5/5	1/1	21* (95%)
Miller et al. (2015)	1/1	2/2	1/2	2/2	3/3	6/6	4/5	1/1	20* (91%)
Nittrouer et al. (2016)	1/1	2/2	2/2	2/2	3/3	6/6	4/5	1/1	21* (95%)
Palmer et al. (2012)	1/1	2/2	2/2	2/2	0/3	4/6	3/6	2/2	16 (67%)
Seong et al. (2015)	1/1	2/2	2/2	2/2	0/3	5/6	4/6	1/2	17 (71%)

Author	Quality Indicators								
	QI-1	QI-2	QI-3	QI-4	QI-5	QI-6	QI-7	QI-8	Total QIs Met (%)
Sheppard & Unswort (2011)	1/1	2/2	2/2	2/2	0/3	3/6	6/6	2/2	18 (75%)
Shogren et al. (2018)	1/1	2/2	2/2	2/2	3/3	4/6	5/6	1/2	20 (83%)
Wehmeyer et al. (2003)	1/1	1/2	1/2	2/2	0/3	6/6	2/5	0/1	13* (59%)
Wehmeyer et al. (2006)	1/1	2/2	2/2	2/2	0/3	3/6	5/6	1/2	16 (67%)
Wehmeyer et al. (2011a)	1/1	2/2	2/2	2/2	0/3	4/6	6/6	2/2	19 (79%)
Wehmeyer et al. (2011b)	1/1	2/2	2/2	2/2	0/3	4/6	4/6	1/2	16 (67%)
Total Number of Studies that met the QI	20 (100%)	17 (85%)	10 (50%)	20 (100%)	9 (45%)	9 (45%)	7 (35%)	12 (60%)	

Note. QI-1 context and setting; QI-2 participants; QI-3 intervention agent; QI-4 description of practice; QI-5 implementation fidelity; QI-6 internal validity; QI-7 outcome measures; and QI-8 data analysis; *indicates SCRD studies with 22 total Qis available.

Discussion

As mentioned previously, this systematic review set out to answer several questions meant to explore and describe the existing empirical research including (a) the extent to which research into SD programs in postsecondary settings been implemented and studied; (b) participant characteristics, identification, IQ, and setting; (c) measurements used and research design; and (d) intervention components and subsequent participant outcomes. Finding out to what extent research into SD programs in postsecondary settings has been implemented and studied proved a challenge. Students can continue to be served in public school settings under IDEA until they are 21, while others choose to move onto PSE programs once they finish high school at age 18. This age overlap makes it difficult to search out SD interventions geared toward only PSE programs. Of the 20 included studies, four were conducted with students no longer in high school (e.g., enrolled in a PSE program or outside agency). Two studies were completed in PSE settings on college campuses, the first (Cook et al., 2017) using inclusive programming as the catalyst to build SD skills and the second (Wehmeyer et al., 2006) utilizing self-determination curriculum (i.e., Beyond High School [Wehmeyer et al., 2006]; SDLMI [Wehmeyer et al., 2000]). While we know that more and more students with IDD are seeking PSE programs after high school (Hart et al., 2010) and the extreme importance SD skills play in overall quality of life (Wehmeyer & Schwartz, 1998; Wehmeyer, 2005; Shogren et al., 2015), there appears to be a large research gap examining specific SD programs implemented and their effects in PSE settings.

Study Characteristics

Findings of this review support results of previous reviews reporting SD instruction mostly taking place in high school settings (Lee et al., 2015; Raley et al., 2018). Half of the

studies did not include specific participant IQs, but grouped participants under a classification of IDD. As a result, accurate comparisons between studies that report participants as having a classification as IDD to other studies which may report participants as having mild, moderate, or severe IDD may not be accurate. Additionally, of the included studies only twelve strictly used participants who had a classified IDD, whereas the remaining eight studies included participants with a variety of disabilities. While all of the studies included participants in the inclusionary 18-21 age range, nearly all participated in a transition program through their local high school. Likewise, the two studies that included programming at PSE settings, used participants who were still being served through their local high school and the PSE courses and placement were part of their transition program. The three studies that included older participants were conducted by outside agencies (e.g., vocational rehabilitation programs).

Measurement and Research Design

As reported in the results, many studies used the same dependent measures, primarily the Arc's Self-Determination Scale, the AIR Self-Determination Scale, and Goal Attainment Scaling. While the Arc's scale provides outcome data for all four essential subdomains of SD (Wehmeyer et al., 1996; Wehmeyer, 1997, 1998) along with an overall SD score, the AIR provides a capacity and opportunity score for the individual as well as an overall SD score allowing researchers to use the two measures to compare overall SD scores of interventions. The dependent measures previously discussed are global measures of self-determination and may require extended time between assessment administration. Researcher-created probes and checklists focused on a variety of skills found in employment, transportation, and goal attainment, which are practical intelligence areas dependent on individual needs and skills of participants (Hallahan et al., 2019). The skills are believed to be characteristics of individuals

who have higher SD, thus drawing the conclusion that with an increase in the skill (e.g., goal attainment, following a self-monitoring checklist), SD skills are also positively impacted.

Research methodologies used in the included studies varied (e.g., SCRD, group-comparison, mixed methods). Interestingly, while the majority of the studies utilized a group design, the number of participants greatly varied from 4 to 494 (average was 141 participants, median was 57 participants, and mode was 4 participants). Many of the studies using large group sizes utilized a pool of participants, which included a percentage of those with IDD. This is not surprising due to the overall small prevalence rate of IDD (U.S. Departmetn of Education, 2018). While all studies reported positive results with increases in participants' SD skills, due to the large variance in participants, results should be interpreted with care.

Self-Determination Curriculum

A large variety of programming and curricula were found to be used in the majority of the included studies (16; 80%). The two programs implemented most were the *Self-Determined Learning Model of Instruction* (SDLMI; Wehmeyer, Palmer et al., 2003) and the *ChoiceMaker* (Martin & Marshall, 1995) used in four and seven studies respectively. Conclusions drawn by authors indicated that both curricula were successful in increasing participant SD skills in a variety of areas. Few studies provided effect sizes, limiting the author's ability to compare interventions. The studies that utilized the *ChoiceMaker* all reported statistical significance, and found that the intervention has moderate to strong effects on increasing participants' SD skills. Out of the four studies that utilized only SDLMI two reported statistically significant results, one reported significant result, and another resulted in no effect. However, two groups of prominent researchers in the field of SD and IDD have developed the majority of these curriculums. The ChoiceMaker has several off-shoots including the Self-Directed IEP (Marshall et al., 1996),

Choosing Employment Goals (Martin et al., 1996), and Taking Action: Making Goals Happen (Huber Marshall et al., 1999). Additionally, there are several continuations or add-ons to the SDLMI, including Beyond High School (Wehmeyer et al., 2006), Whose Future Is It Anyway? (Wehmeyer et al., 2004), and the Self-determined Career Development Model (Wehmeyer, Lattimore et al., 2003). Three studies that reported findings form instituting the previously mentioned interventions reported large effects and statistical significance.

Self-Monitoring

As previously discussed, individuals with IDD have deficits in learning and remembering new information, metacognition, and in particular working memory (Bebko & Luhaorg, 1998; Heward, 2009; Levorato et al., 2011). Not surprisingly, five of the included studies incorporated the use of a self-regulatory strategy such as a self-monitoring sheet or a self-management tool. The self-regulating tools were individualized and used as components of the intervention to help participants increase task completion. Four of the five studies that used self-monitoring tools reported moderate to very large effect sizes (PEM .71 – 1.00) in participant in task completion of a goal. In theory, the use of a self-regulatory tool should increase participants' SD skills in all four areas of SD, including autonomy (Sigafoos et al., 1988), self-regulation (Agran, 1997), psychological empowerment (Wehmeyer, 1997; Zimmerman, 1990), and self-realization (Wehmeyer et al., 1996). Four studies that used a self-regulatory skill only used task completion as the dependent measure, and did not use either the Arc's Self-Determination Scale or the AIR Self-Determination Scale. The use of these measures may allow us to compare the self-regulatory tools to increases in participant SD scores.

Goal Attainment

The instructional component used most often in the SD programs or approaches was that of goal attainment, which falls under the SD component of self-regulation. Sixty-five percent (13) of the included studies focused on using goal setting and goal attainment as the main component to build SD skills in students with IDD. Goal setting and attainment include self-regulating behaviors such as decision-making, problem-solving, self-monitoring, self-evaluation, and self-instruction (Smith & Nelson, 1997). However, due to the complex and interwoven nature of SD subdomain, it proved difficult to tease out individual approaches (e.g., self-management versus self-monitoring). Nearly half of the studies focused on participant knowledge of their IEPs, IEP participation, or transitional components, which is supported by an evidence base showing that increased SD skills increase post-school outcomes (Wehmeyer et al., 2013).

Included studies all reported positive intervention impact on participants' SD level, with the majority reporting moderate to very large effects. As mentioned previously, fourteen of the studies were a group design. Of the group design studies, only a quarter of the studies provided effect sizes, with one study using Cohen's *d*, two studies using correlation (*r*) effects and two studies reporting Eta squared (η^2) effect sizes. While the majority of the group studies provided statistical significance results, two only provided pre and post dependent measure scores. SCRD studies all provided graphs of participants data points. IRD, PEM, and PND were calculated for all SCRD studies, and five of the six all indicated effect sizes of moderate effectiveness or very effective. While the results of the SCRD are encouraging, it is difficult to compare their results with the effectiveness of the group study designs.

Limitations

Results from this systematic review need to be viewed cautiously, taking the limitations into consideration. Due to the nature of this project, there was no inter-observer agreement. For example, articles were only screened by one author, studies were only coded by the same author, and QIs were determined by only one author as well. As a result, there is a possibility that studies could have been missed or miscoded. Also, SCRD results lack inter-observer reliability. Additionally, due to the connected nature of the various SD subdomain and behaviors, there is the possibility that a program or outcome measure was assigned to component that was not what the study's authors had intended.

Implications and Future Research

This review suggests that programs for increasing SD skills are being taught in a wide variety of settings with a range of ages of individuals with IDD, utilizing a multitude of programs, curricula, and strategies. Learning does not merely stop when students exit public school at age 18 or 21 and continues throughout an individual's life. PSE settings would offer another opportunity to provide additional SD instruction to individuals with IDD. However, there is a research gap on increasing self-determination skills in students with IDD who are in a post-secondary educational setting. Future research should focus on examining the impact that SD curricula or programming affect SD skills in individuals with IDD. Additionally, future research into SD programs would do well to report outcome measures for each SD subdomain instead of an overall SD score. Reporting outcomes by individual SD subdomain will help to determine if SD programs impact certain SD subdomains more than others.

Conclusion

This review suggests there are many programs, curricula, and strategies being used to increase SD skills in individuals with IDD under the conceptualization of self-determination as a

basic human right (Wehmeyer, 1998). SD interventions focusing on improving autonomy, self-regulation, psychological empowerment, and self-realization behaviors in individuals with IDD are being used with a large age range of participants, in a variety of settings, and with an assortment of program components. Recognizing the potential impacts SD skills have on quality of life, it is encouraging to discover the existence of a large research base regarding the use and efficacy of SD programs (Lachapelle, et al., 2005; Shogren et al., 2015; Wehmeyer, 2005; Wehmeyer & Palmer, 2003; Wehmeyer & Schwartz, 1998). This review found that the *ChoiceMaker* curriculum and a goal attainment approach are the most utilized SD interventions. Findings also support the use of self-monitoring strategies to increase the effectiveness of SD interventions. However, as this review found, there is a scarcity of research focused on self-determination interventions implemented in PSE settings. Considering the findings from this review, a SD intervention utilizing the *ChoiceMaker* curriculum focused on goal attainment, would be an appropriate intervention to determine the effects of a self-monitoring strategy on participants with IDD within a PSE programs.

CHAPTER III: METHOD

In addition to varying intellectual and adaptive behavior deficits, individuals with IDD often have deficits with learning and remembering new information and metacognition (Bebko & Luhaorg, 1998; Heward, 2009; Levorato et al., 2011). In particular, individuals with IDD typically struggle with working memory (Levorato et al., 2011), which involves the ability to keep information in mind while completing a simultaneous task. Metacognition, closely related to self-regulation, refers to an individual's awareness of what strategies are needed in order to complete a task, the ability to use those strategies, and the ability to evaluate how the strategies worked (Alloway, 2010; Heward, 2009). When learning the *Choosing Personal Goals* component of the *ChoiceMaker Curriculum* (Martin & Marshall, 2016) students with IDD may benefit from the use of a self-monitoring checklist with picture prompts. The self-monitoring checklist can be used to track knowledge during curriculum lessons as well as be used as reference during goal-setting meetings. Additionally, a self-monitoring checklist may provide motivation for the participant to attend to the task of goal setting. The purpose of this study is to examine the effectiveness of a self-monitoring checklist as a component of the *ChoiceMaker Curriculum* for students with IDD on knowledge of personal goal-setting steps.

The study endeavors to answer the following three research questions:

1. How does the *ChoiceMaker Curriculum* and the self-monitoring checklist affect post-secondary students' self-determination?

   Hypothesis: Both the *ChoiceMaker Curriculum* and self-monitoring checklists have been shown to increase self-determination in individuals with IDD (Cross et al., 1999; Diegelmann & Test, 2018; German et al., 2000; Martin et al., 2006). Due to the study design multiple goals will not be able to be accomplished and the self-monitoring

checklist will only be used in one context. As a result, the standardized measures will report only a slight increase in self-determination skills of participants.

2. To what extent does a self-monitoring checklist with picture prompts increase post-secondary students' knowledge of goal-setting steps?

   Hypothesis: self-monitoring has been shown as a useful and effective learning strategy (Agran, 1997; Agran et al., 2005), the use of the self-monitoring checklist should greatly increase the number of goal-setting steps participants can recall and accurately answer.

3. What are students' perceptions of *ChoiceMaker Curriculum* and the self-monitoring checklist program?

   Hypothesis: Participants will share positive views regarding both the curriculum and the self-monitoring checklist. Some participants may be able to articulate reasons of why both were helpful or not helpful.

Methods

Experimental Design

A multiple probe across participant design (multiple-baseline; Horner & Baer, 1978) was used to explore the effects of the *Choosing Personal Goals* (Martin & Marshall, 2016) program and self-monitoring goal-setting checklist on student knowledge of goal-setting steps. Utilizing this design, participants served as their own control condition to evaluate any changes between the control phase, intervention phase, and the self-monitoring checklist phase as described in detail in subsequent sections (Kazdin, 2011).

Participants

After seeking and receiving university IRB approval, a sample of six participants enrolled in a post-secondary education (PSE) program for young adults with IDD were invited to

participate in the present study. While current students participate in a disability awareness course, they do not have a specific course geared toward increasing self-determination and goal setting. Selection criteria for participants required that they be enrolled in the second, third, or fourth year of the PSE program and have a diagnosis of mild or moderate ID (i.e., IQ of 36-70). Participants included five juniors and one sophomore. Gender was slightly skewed toward male, with four (60%) participants and two (40%) females. IQ ranged from 40 to 53, with an average of 46.2. Participants were aged 20 to 23, with an average age of 21.8. Adaptive skills for participants ranged from 40 to 80, with an average of 64.5. See Table 3.1 for participant characteristics.

Table 3.1

Participant Demographics

Participant	Disability	IQ (Instrument)	Adaptive Scores (Instrument)	Age
Finn	Down Syndrome	46 (SB5[1])	76 (Vineland II[5])	22
Smith	Cerebral Palsy	48 (WAIS-IV[2])	70 (Vineland II[5])	20
Baylie	Down Syndrome	48 (KBIT-2[3])	66 (ABAS-II[6])	23
Livy	Down Syndrome	53 (WAIS-IV[2])	40 (SIB-R[7])	23
David	Down Syndrome	42 (RIAS[4])	55 (ABAS-II[6])	22
Benjamin	Down Syndrome	40 (SB5[1])	80 (ABAS-II[6])	21
Average		46.2	64.5	21.8

Note. [1] Stanford-Binet Intelligence Scales, Fifth Edition; [2] Wechsler Adult Intelligence Scale, Fourth Edition; [3] Kaufman Brief Intelligence Test, Second Edition; [4] Reynolds Intellectual Assessment Scales; [5] Vineland Adaptive Behavior Scales, Third Edition; [6] Adaptive Behavior Assessment System, Second Edition; [7] Scales of Independent Behavior – Revised.

Setting and Materials

The study was conducted at a PSE program with 40 students housed at a public university in the southeastern United States. All phases of the intervention and study were conducted in the participants' classroom, where they typically receive weekly instruction. Materials used during this study included (a) *Choosing Personal Goals*, from the *ChoiceMaker Instructional Series* (Martin & Marshall, 2016), (b) researcher-made self-monitoring checklist with picture prompts, (c) researcher-made vocabulary word flashcards with picture prompts, (d) a laptop computer, (e) document camera, and (f) classroom smartboards.

Curriculum

The *Choosing Personal Goals* (Martin & Marshall, 2016) is a subset of the ChoiceMaker Self-Determination Curriculum. The purpose of the ChoiceMaker curriculum and accompanying lessons are to increase students' self-determination skills necessary for success by teaching them to set goals and follow through on attaining them. The *Choosing Personal Goals* lessons provide a process for students to choose goals they may have for themselves in their personal lives by identifying their interests, skills and limitations, and identifying opportunities in their school and community that matches their goal. The aim of the lessons is to help students to develop fulfilling personal lives and to spend their free time in safe, legal, and healthy ways. The *Choosing Personal Goals* module contains 11 lessons that focus on three objectives (a) Express Personal Interests, (b) Express Personal Skills and Limits, and (c) Express Options and Choose Personal Goals. Required times for each lesson range from as little as 40 minutes to as many as 120 minutes. Individual lesson titles, content, and suggested time, can be found in Appendix A. Curriculum Overview, Table A1.

Systematic instruction is crucial for individuals with IDD (Drasgow et al., 2017). The *Choosing Personal Goals* lessons provide a systematic and explicit lesson format. Each lesson and activity are scaffolded providing feedback until individual mastery is achieved, all of which are components of explicit instruction (Archer & Hughes, 2011). The *Choosing Personal Goals* curriculum can be found and downloaded for no cost at http://www.ou.edu/education/centers-and-partnerships/zarrow/choicemaker-curriculum/choicemaker-self-determination-materials.

Student Goal-Attainment Checklist

Two self-monitoring checklists, created by the author were used during the study. Both checklists included the six goal-setting steps in text, a corresponding picture prompt, and a box for participants to place a checkmark in after they answered each step. Terminology used in the curriculum was adapted to a more appropriate level to meet the cognitive level of participants (e.g., using the term "needs" to replace the term "requirements"). Both self-monitoring checklists can be found in Appendix B, Figures B1 and B2. The self-monitoring goal-setting checklists had been used during a pilot study to assess usability.

Instructional Self-Monitoring Checklist

The instructional self-monitoring checklist included lines for students to write down individual answers to each of the goal-setting steps and was used as an instructional component of the curriculum during the intervention (Phase I). The checklist was laminated and participants used dry-erase markers to write their responses. Each session participants would start with a blank check-list and complete as the lesson progressed.

Self-Monitoring Checklist Measure

A self-monitoring checklist, without lines was given to participants as a tool during Phases II and III data collection. If the participant entered Phase II or III they were provided the

checklist during the data collection of the maintenance phase as well. The purpose of the self-checklist was to act as a self-regulatory aide to help participants respond to each goal-setting step.

Interventionist & Treatment Fidelity

The interventionist for this study was a special education doctoral student who has over ten years of working with youth and adults with IDD in public schools, PSE programs, and adult workshop settings. Another doctoral student in special education was trained by the first author in all aspects of the *Choosing Personal Goals* curriculum procedures and observed 30% of lessons to measure procedural fidelity, as well as provide interrater reliability data on probes and dependent measures that were given (detailed description of procedure provided in subsequent section).

Dependent Variables

While the primary dependent measure will be individual participant probes, several measures were utilized in this study, including both standardized assessments and researcher created measures. Table 3.2 provides a timeline of the study and when these measures were administered to participants.

Table 3.2

Intervention Timeline and Dependent Measure by Phase

Phase	Overview	Dependent Measure
Baseline	Participants will all receive five Probes and Probe Questions (without checklist) and standardized assessments.	Demographic survey Probes and Probe questions

Phase I: Intervention	Standardized measure will be given in a session immediately before Phase I begins. Probes and Probe questions before intervention without checklist	ARC* AIR* Probes and Probe questions
Phase II: Self-Monitoring Checklist	Probes with Probe questions with checklist with no intervention.	Probes and Probe questions
Phase III: Self-Monitoring Checklist & Explicit Instruction	Probes and Probe questions before explicit instruction (if needed)	Probes and Probe questions
Maintenance	Probe with checklist	Probes and Probe questions Semi-structured interview

Note: *Post-assessment of the ARC and AIR standardized measures were given to individual participants when they meet mastery criteria as explained subsequently.

Standardized Assessments

Two standardized assessments were given to the students at the beginning and end of the program to gauge the impact of the intervention on student self-determination. *The Arc's Self-Determination Scale*: Post-Secondary Version (Wehmeyer et al., 2014) is a student self-report containing 28-items. A second-related measure that will be given to students is the *AIR* (American Institutes for Research) Self-Determination Assessment (Wolman et al., 1994). The *AIR* measures individual capacity as well as opportunities to practice self-determination. There are teacher, student, and parent forms of this measure. Only the student form (*AIR-S*) was used and analyzed for this study. The scale includes 18 items with 5-point Likert type responses (1 = *never*, 5 = *always*), which consist of capacity and opportunity subscale scores. Participants took the standardized assessments just prior to their start of Phase I. Participants were given the post standardized assessment when they met mastery criteria, with the intention of showing the

impact the self-monitoring checklist and the intervention curriculum has on impacting student self-determination. Both the Arc (Figure C1) and the AIR (Figure C2) scales can be found in Appendix C. Dependent Measures.

Researcher Created Measures

Probes

The dependent variable is the number of steps of goal-setting the student explained correctly as described in the *Choosing Personal Goals* (Martin & Marshall, 2016) intervention. The goal-setting procedure was broken into six steps with corresponding responses for each probe question. For example, probe question one asks participants to identify four personal interests. Students received one point for each personal interest they provided. Table 3.3 provides probe questions, possible responses and total points available for each question. The total possible correct answers for the probe dependent variable was 27. For participants to receive the highest scores (3 points) possible for questions 2-6, responses were to be "expansive". However, it was not believed that expansive answers were required to show mastery of these questions due to concerns of participant language skills. As a result, mastery was set at 19 out of 27 (70%) independent responses. For questions 2-6, scores of 2 demonstrated mastery. This score required reasonable and related answers, but did not have to be expansive. Percentage of correct goal-setting step responses was calculated by the number of correct responses divided by the possible responses (i.e., 27) multiplied by 100. Probes were given prior to the beginning of each intervention session, before instruction had begun. A sample probe can be found in Appendix C. Dependent Measures, Table C1 Probe Checklist.

Semi-Structured Interviews

All subjects participated in semi-structured interviews. Although questions may have been individualized or expanded, questions focused on participants' perceptions of the program (e.g., "What did you set as your goal?", "Why did you choose that goal?", "Did you like using the self-monitoring checklist?", "Why?"). The base questions can be found in Figure C3, in Appendix C. Dependent Measures.

Interobserver Training and Reliability

A second researcher was trained to collect interobserver reliability data for all three dependent variables (i.e., probe, ARC, and AIR). Over the course of the study a total 158 probes were given to participants. Reliability data was conducted for 33% – 100% probes per each participant; per phase. Item by item agreement for interobserver reliability was analyzed by dividing the number of agreements (955) by the total number of points (957) times 100 (Cooper et al., 2007) with a mean of 99.79% (range 91%-100%). Additionally, a checklist for each lesson was used to ensure that all intervention content is delivered to the participants. This checklist was self-monitored, with the secondary researcher observing 30% of all intervention classes to ensure treatment fidelity. An example of a lesson fidelity checklist can be found in in Appendix D. Treatment Fidelity, Figure D1.

Interventionist & Treatment Fidelity

A doctoral student in special education provided intervention and treatment fidelity interrater reliability. The special education doctoral student observed 36% of lessons to measure procedural fidelity. To ensure treatment fidelity throughout the various portions of the intervention, four lessons (2, 3, 6, and 9) for each participant pair, were viewed to measure procedural fidelity using a random number generator. Procedural fidelity ranged from 99% to 100%.

Table 3.3

Probe Scoring Example Rubric

Questions	Scoring Rubric with Example Responses				
	0 – Points No answer, or non-related	1 – Point Nonspecific, or highly unlikely	2 – Points Related, reasonable, non-expansive	3 – Points Reasonable, related, and expansive	Total possible points
1. Tell me three things you like to do in your free time?	No interests named.	Provides 1 interest	Provides 2 interests	Provides 3 interests	3 = 1 point for each interest
2. Tell me two things needed to… (the last personal interest they shared; e.g., "bake cookies")	No answer	apartment	Ingredients*	I need to be able to read the recipe.	6 = 2 responses X 3 points
3. Tell me two skills you have or use for… (the last personal interest they shared; e.g., "baking cookies")	I have muscles.	kitchen	oven mitts*	I use an oven mitt so I don't get burned.	6 = 2 responses X 3 points
4. Do you have the skills that are needed to …. (the last personal interest they shared; e.g., "bake cookies")	I can lift weights.	Sure or Maybe	Yes or No*	Yes, since I use an oven mitt I don't get burned when I take cookies out of the oven. No, I don't know how to use an oven.	3
5. Tell me two things that might keep you from… (the last personal interest they shared; e.g., "baking cookies")	I can lift 100 pounds.	I don't have any limits.	Reading*	I can't read the recipe when I bake cookies.	6 = 2 responses X 3 points

6. Do …. (the limits they answered with previously; e.g., "I can't read the recipe when I bake cookies") interfere with what is needed to … (the last personal interest they shared; e.g., "baking cookies")?	No answer	sometimes	Yes or No*	Yes, I have to have someone help me read the recipe. No, I can listen to an app that reads instructions for baking cookies on my phone.	3
Total					27 points

Note. *Indicates mastery responses.

Implementation Procedures

Pre- and Post-assessment Procedures

After receiving approval from the university's Institutional Review Board, consent and assent for participation in the study was obtained. Demographics were gathered for all participants, including gender, age, disability, IQ, and adaptive functioning scores prior to the beginning of the study.

Baseline

The first and second researcher met with each participant individually to give baseline probes. Participants were given the probe three days in a row for baseline. The pair of participants that displayed the most stable baseline were then given two additional days of baseline probes before entering into Phase I. For each baseline probe the researcher greeted each participant and asked probe questions. During baseline probes the self-monitoring goal-setting checklist was not provided for participant use. Participants were asked the first question, "What are three things you like to do in your free time? The researcher used the last interest the participant provided for the remaining probe questions. For example, if the participant provided their interest of "baking" last, for question two the researcher then asked "Tell me two things that are required for baking"; question three would be, "Tell me two skills you have for baking". If the participant did not respond within 10 seconds a zero-point score was given for that individual probe question. All probe sessions were audio recorded and transcribed for accuracy. The probe checklist can be found in Appendix C. Dependent Measures.

Phase One: Intervention

Before each pair of participants entered Phase I, they were given the two self-determination measures (e.g., AIR-S, Arc's Self-Determination Scale) as described previously.

Each intervention session began with individual probes given using the same probe and procedures as described in baseline, without the student self-monitoring checklist. Each session followed the curriculum and format provided in the *Choosing Personal Goals* (Martin & Marshall, 2016) program. At the conclusion of each session, the researcher and participants reviewed vocabulary words and practiced the steps of goal-setting that had been taught using the modified self-monitoring goal-setting checklist (see Appendix B, Figure 3.3). Sessions were conducted three times a week for 90 minutes each session for two weeks, and two times a week for 90 minutes for one week. Individual lesson titles, content, and suggested time, can be found in Appendix A. Curriculum Overview.

Phase Two: Self-Monitoring Checklist

Any participants who did not meet mastery of goal-setting steps after Phase One moved into Phase Two. Mastery was set at 19 out of 27 (70%) independent responses (see previous section on Dependent Measures for additional information). Phase Two consisted of participants completing five additional probes without instruction, but with the use of the self-monitoring goal-setting checklist. The self-monitoring checklist included text, picture prompts, and a box for participants to place checkmarks. Checklists did not include any personal participant information. The checklist was provided during this phase to examine the effects of the self-monitoring checklist with picture prompts on participant responses to probes. The checklist can be found in Appendix B, Figure 3.2.

Phase Three: Explicit Instruction

Any participants who did not meet mastery of goal-setting steps after Phase Two were moved to Phase Three. Phase Three involved individual explicit instruction sessions based on the goal-setting steps participants responded to incorrectly during Phase Two probes. The self-

monitoring goal-setting checklist was available for participants during the Phase Three probes, as it was during Phase Two. Explicit instruction sessions continued until students met mastery criteria. The decision making-process for implementation of the phases followed the same model as created and described by Diegelmann and Test (2018), which can be found in Figure 3.1.

Figure 3.1

Implementation Model

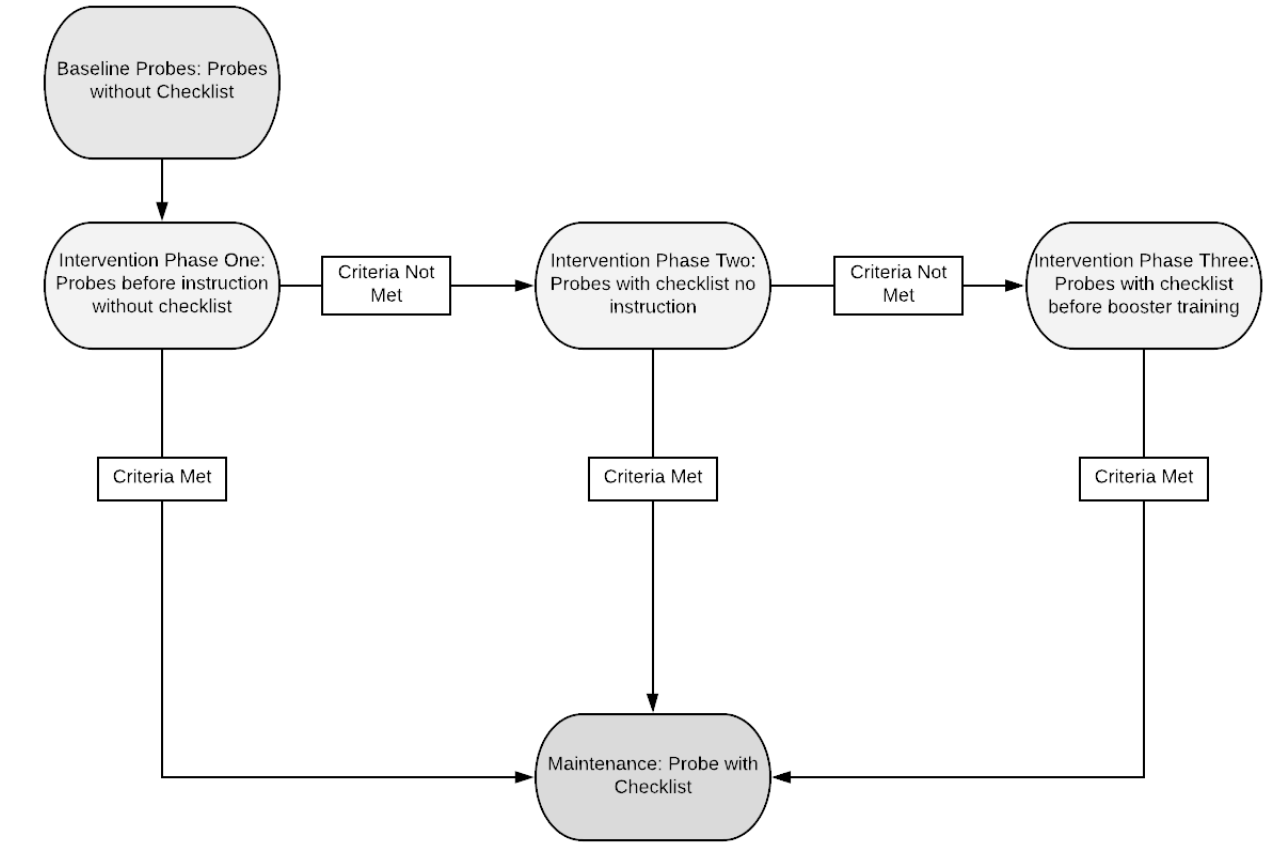


Figure 3.1 Decision-Making Diagram

Based on Decision-Making diagram found in Diegelman and Test (2018).

Maintenance

Following mastery criteria, participants were given the two self-determination measures (e.g., AIR-S, Arc's Self-Determination Scale) as described previously. Maintenance data was

collected approximately 30 days following mastery. Participants were given the same probe that was used during baseline and intervention probes. For participants who met criteria in Phase Two or Phase Three, the goal-setting checklist with picture prompts was available during maintenance probes.

Data Analysis

Effects of the self-monitoring goal-setting checklist on student ability to identify individual knowledge of goal-setting steps were examined using a combination of visual analysis and calculation of effect sizes (ES) between baseline and the intervention conditions.

Visual Analysis

While there has been much dispute regarding the best method to calculate an effect of single case design, there has been general agreement that the primary method of assessment has been and should remain visual analysis (Rakap, 2015; Wolery et al., 2010). Visual analysis provides a useful tool for making a summative judgment about the outcome of treatment for a case. To measure study effects of each student, after converting probe scores to percentages, a visual analysis of the graphed data was completed. This technique allows for analysis of changes in level, trend, variability, immediacy of the effect, overlap, and consistency of data patterns across similar phases. Following Kratochwill and colleagues' (2013) recommendations and specific guidelines for visually analyzing single case research design (SCRD), visual analysis will be conducted for all three phases for each group.

Statistical Analysis

While visual analysis and hypothesis testing have traditionally been the accepted methods for evaluating the effectiveness of single case design studies, the American Psychological Association (APA) also recommends the use of Effect Size (ES) in the presentation of research

results (APA, 2020). ES represents the strength of a treatment outcome measure. ES for this study was calculated using percentage of data points during the intervention that exceeded the median of baseline phase (PEM). PEM is a technique based on the assumption that if an intervention is effective, data points in the treatment phase will be predominantly on the therapeutic side of the baseline median (Lenz, 2013; Ma, 2006). The larger the ES value, the greater the change in the outcome measure. The range of potential ES values for PEM range from 0% to 100% (Ma, 2006). PEM scores of 90% or higher indicate a highly effective intervention, PEM scores between 70% and 89% indicate moderately effective interventions, PEM scores between 50% and 69% indicate questionable interventions, while PEM scores below 50% indicate an ineffective intervention (Ma, 2006, 2009).

Standardized Assessments

A repeated measures ANOVA was used to examine how participant scores on self-determination changed between pretest and posttest as measured on two occasions using the same dependent variables (e.g., ARC, AIR Self-Determination Scale). The repeated measures ANOVA was used to test for statistical changes in the scores of participants. This analysis is often used with study designs that use the same measure repeatedly, and provides more statistical power with less participants, while allowing researchers the ability to analyze trends in data. An ANOVA allowed analyzing participants' score change on each component assessed by the dependent measures (e.g., student self-regulation, autonomy). Due to the large number of subscales (15), and the potential for an increase in Type I errors, a Bonferroni adjustment was made to lower the alpha to 0.03. A *p* value was calculated to determine probability, and to designate significance, using the alpha level of 0.03. The means and standard deviations were then used to find the effect size in Cohen's *d* (Cohen, 1988). Assumptions of the repeated

measures ANOVA were examined, including independence of the scores ensuring that the score is representative of the individual. Assumptions of normality were determined to ensure that any skew and kurtosis found have a normal distribution. Sphericity was also evaluated to ensure that the assumption of homogeneity of variance was met. Assuming that the repeated measures ANOVA results in statistical findings, a follow-up of analysis consisted of running contrasts to determine what changes in scores were statistically significant.

Additionally, interrater reliability was completed on the open-ended questions found in both the standardized assessments. There were 10 open-ended questions on both the ARC and the AIR, which were given to participants prior to entering intervention and immediately following mastery of the probe. In total there were 120 open-ended questions. All of these questions were double coded, with a 100% agreement rate.

CHAPTER IV: RESULTS

There were three purposes of this study: (a) to examine the effects of a self-monitoring checklist of goal-setting steps knowledge in post-secondary students with IDD, (b) the extent that the self-monitoring checklist as a component of the *ChoiceMaker Curriculum* may impact participants' self-determination, and (c) participant perspectives of the *ChoiceMaker Curriculum* and self-monitoring checklist. First, a visual analysis was performed on the six students' correct responses of goal-setting steps (see Figure 4.1).

Multiple-Baseline Single Case Findings

A visual analysis was performed of the six participants' graphed data. The baseline phase for participants was fairly stable with no trend in performance and little variability across the baseline phase for individual participants (M = 33%). During Phase I participants received on average 9 instructional sessions each lasting approximately 30 minutes, for an average total of 247 minutes. During intervention, probe scores increased slightly (M = 42%), with only one participant meeting mastery during this phase. As mastery was not met at the end of Phase I for the remaining five participants, they entered Phase II (Self-Monitoring Checklist [SMC]). A slight increase in level during Phase II was seen (M = 46%), however the remaining five participants did not meet mastery during this phase, so were provided Phase III (SMC & Explicit Instruction [EI]). During Phase III there was a large increase in trend between the probes (M = 65%). One month after each individual achieved mastery, they were individually given 5 additional probes for the maintenance phase. Participants probe scores slightly decreased (M = 63%). The points exceeding the median (PEM) was calculated to gauge the change between each phase for all participants. Differences between baseline and Phase II resulted in an overall PEM of 0.70, indicating a moderately effective intervention (Ma, 2006). Mean scores on each phase

can be found in Table 4.1. Individual visual analysis for each of the six participants can be found in subsequent sections.

Finn

A visual analysis was performed of Finn's graphed data. The baseline phase for Finn was stable with no trend in his performance and little variability across the baseline phase (*M* = 27%, range 15% – 33%). During Phase I Finn received 8 instructional sessions each lasting approximately 26 minutes, for a total of 257 minutes. As mastery was not met at the end of Phase I (*M* = 31%, range 15% - 44%), Finn entered the next Phase II. An increase in level between the first and second probe of Phase II was seen (*M* = 50%, range 30% – 63%), however Finn did not meet mastery during this phase so was provided Phase III instruction. During Phase III there was a large increase in trend between the first and second probe of Phase III (*M* = 64%, range 26% – 78%). One month following the last probe of Phase III, Finn was given 5 additional probes for the maintenance phase (*M* = 171%, range 59% – 78%). The points exceeding the median (PEM) was calculated to gauge the change between each phase. Differences between baseline and Phase II resulted in an PEM of 0.80, indicating a moderately effective intervention (Ma, 2006).

Smith

A visual analysis was performed of Smith's graphed data. The last three data points of Smith's baseline phase were stable with no trend in his performance and slight variation only between the first few probes (*M* = 44%, range 26% – 59%). During Phase I Smith received 8 instructional sessions each lasting approximately 26 minutes, for a total of 257 minutes. As mastery was not met at the end of Phase I (*M* = 48%, range 33% - 56%), Smith entered the next Phase II. An immediate increase in level between Phase I and Phase II was initially seen, but then stabilized (*M* = 58%, range 44% – 67%) again Smith did not meet mastery during this phase

so was put into Phase III. Smith met mastery level on the second probe of Phase III (*M* = 72%, range 67% – 81%). One month following the last probe of Phase III, Smith was given 5 additional probes for the maintenance phase (*M* = 67%, range 59% – 70%). Differences between baseline and Phase II resulted in a PEM score of 0.80, indicating a moderately effective intervention.

Baylie

A visual analysis was performed of Baylie's graphed data. The last three data points of Baylie's baseline phase were stable with no trend in her performance and slight variation only between the first few probes (*M* = 39%, range 26% – 48%). During Phase I Baylie received 10 instructional sessions each lasting approximately 24 minutes, for a total of 236 minutes. During Phase I Baylie increased her correct responses on the steps of personal goal setting with an immediate change in level that then stabilized, until the last three probes when Baylie met mastery criteria (*M* = 65%, range 59% – 74%). As mastery was met at the end of Phase I, Baylie entered into the Maintenance Phase. One month following the last probe of Phase I, Baylie was given 5 additional probes for the maintenance phase (*M* = 54%, range 37% – 59%). Differences between baseline and Phase I resulted in a PEM score of 1.00 indicating a highly effective intervention (Ma, 2006).

Livy

A visual analysis was performed of Livy's graphed data. The last three data points of Livy's baseline phase were stable with no trend in her performance and slight variation only between the probes (*M* = 28%, range 22% – 33%). During Phase I Livy received 9 instructional sessions each lasting approximately 24 minutes, for a total of 216 minutes. As mastery was not met at the end of Phase I (*M* = 50%, range 30% – 67%), Livy entered Phase II. An immediate

increase in level between Phase I and Phase II was initially seen, but then stabilized (*M* = 56%, range 44% – 63%). Again, Livy did not meet mastery during this phase so was put into Phase III. Livy met mastery level on the second probe of Phase III Phase III (*M* = 64%, range 48% – 70%). One month following the last probe of Phase III, Livy was given 5 additional probes for the maintenance phase (*M* = 56%, range 44% – 67%). Differences between baseline and Phase II resulted in a PEM score of 1.00 indicating a highly effective intervention (Ma, 2006).

David

A visual analysis was performed of David's graphed data. The overall data points of David's baseline phase were stable with no trend in his performance and slight variation only between the probes (*M* = 26%, range 22% – 30%). During Phase I David received 9 instructional sessions each lasting approximately 20 minutes, for a total of 185 minutes. No immediate increase in level between the Baseline Phase and Phase I was initially seen and scores declined with some variability (*M* = 21%, range 11% – 33%), as David did not meet mastery during this phase so was put into Phase II. A small increase in level between Phase I and Phase II was seen throughout the phase (*M* = 27%, range 19% – 41%), again David did not meet mastery during this phase, so was put into Phase III. David met mastery level on the fourth probe of Phase III (*M* = 62%, range 33% – 70%). One month following the last probe of Phase III, David was given 5 additional probes for the maintenance phase (*M* = 67%, range 59% – 70%). Differences between baseline and Phase II resulted in a PEM score of 0.20, indicating an ineffective intervention (Ma, 2006).

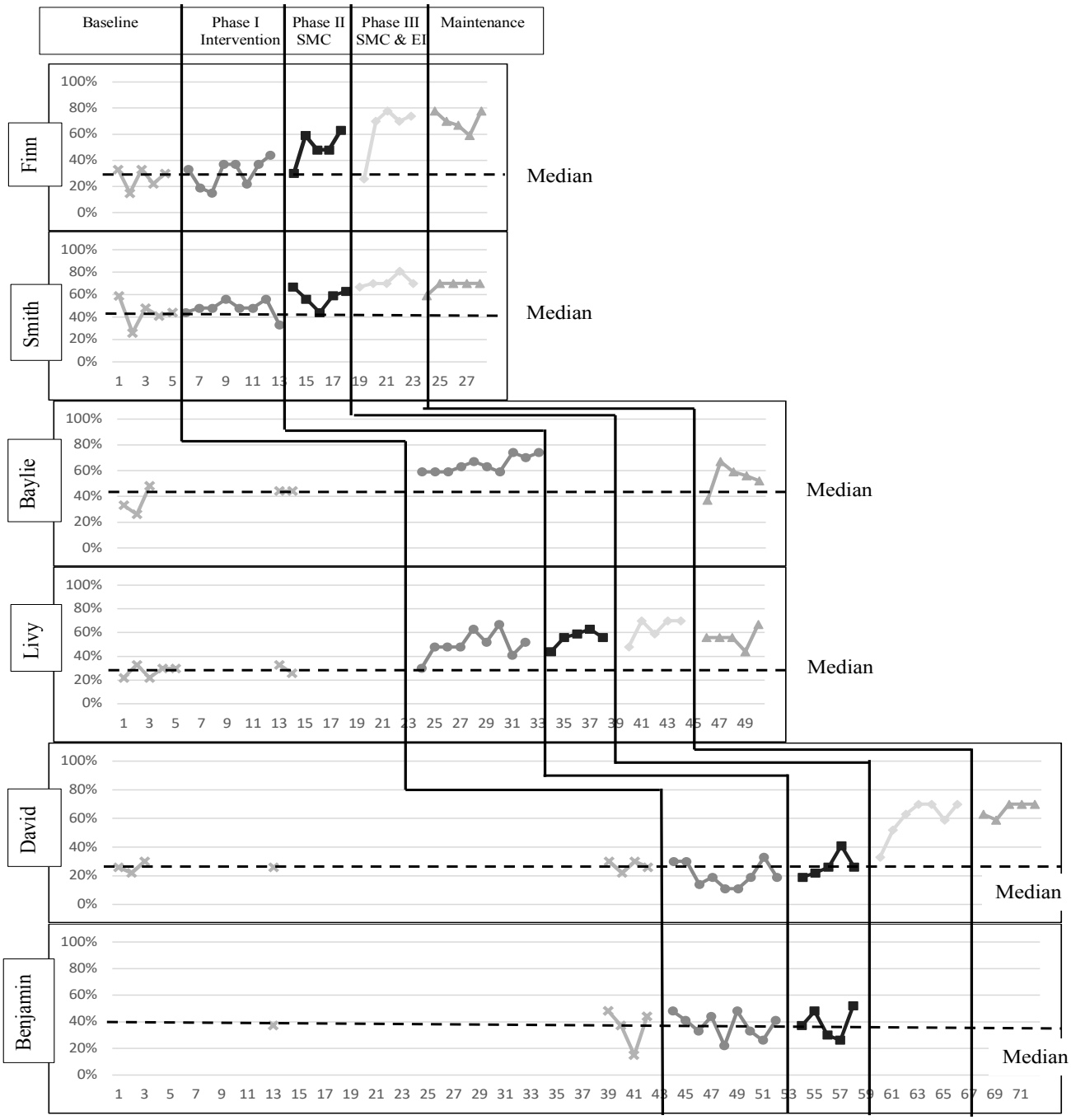
Benjamin

A visual analysis was performed of Benjamin's graphed data. The first three data points of Benjamin's baseline phase were stable with no trend in his performance. One sharp decline on

his fourth baseline probe occurred before increasing on the fifth probe back to similar scores as his first three baseline probes (*M* = 36%, range 15% – 48%). During Phase I Benjamin received 9 instructional sessions each lasting approximately 20 minutes, for a total of 185 minutes. No immediate increase in level between the Baseline and Phase I was initially seen, and probe scores were very variable (*M* = 37%, range 22% – 48%), as mastery was not met at the end of Phase I, Benjamin entered Phase II. No immediate increase in level was seen during Phase II (*M* = 39%, range 26% – 52%), again Benjamin did not meet mastery during this phase. At the conclusion of this phase, Benjamin had been at home due to the COVID-19 outbreak. He requested to be dropped from the study, and as a result subsequent probes and phases were discontinued. Differences between baseline and Phase II resulted in a PEM score of 0.40, indicating an ineffective intervention (Ma, 2006).

Figure 4.1

Goal-Setting Probe Results



Note. SMC – Self-Monitoring Checklist; EI – Explicit Instruction

Table 4.1

Participant Mean Probe Scores Percentage by Phase

Participant	Baseline	Intervention	SMC	SMC & EI	Maintenance	PEM
Finn	27%	31%	50%	64%	71%	0.80
Smith	44%	48%	58%	72%	67%	0.80
Baylie	39%	65%			54%	1.00
Livy	28%	50%	56%	64%	56%	1.00
David	26%	21%	27%	62%	67%	0.20
Benjamin	36%	37%	39%			0.40
Average	33%	42%	46%	65%	63%	0.70

Note. SMC (self-monitoring checklist); SMC & EI (self-monitoring checklist and explicit Instruction.).

Standardized Measure Findings

Participants completed two standardized measures, the AIR Self-Determination Scale (Wolman et al., 1994) and the ARC Self-Determination Post-Secondary Scale (Wehmeyer et al., 2014). Participants were given the measures immediately before entering intervention, and upon mastery. Repeated-measures ANOVAs (RMAs) were completed using SAS JMP software. RMAs were deemed most appropriate due to the last two participants having incomplete assessment data. Descriptive data including mean, standard deviation, skew, and kurtosis for both standardized measures can be found in Tables 4.2 and 4.3. The last two participants were only able to complete the final standardized assessment in part, due to being sent home because of COVID-19. As a result, only the parts of the assessment that could be completed effectively through FaceTime were given.

Table 4.2

AIR Descriptive Statistics

	Pre			Post		
	N	Mean (SD)	Skew (Kurtosis)	N	Mean (SD)	Skew (Kurtosis)
Things I Do	6	24.3 (7.55)	-1.15 (10.37)	4	25.5 (5.2)	-1.54 (2.89)
How I feel	6	26.83 (3.92)	-0.65 (-2.12)	4	26.5 (3.7)	-1.9 (3.71)
Capacity	6	51.17 (11.36)	-0.94 (-1.27)	4	52 (8.87)	-1.72 (3.26)
What Happens at School	6	27 (3.46)	-1.21 (0.93)	4	26.75 (5.85)	-1.96 (3.86)
What Happens at Home	6	26.67 (4.55)	-1.8 (3.45)	4	27.5 (3.7)	-1.9 (3.71)
Opportunity	6	53.67 (7.94)	-1.57 (2.49)	4	54.25 (9.54)	-1.96 (3.85)
Level of Self-Determination	6	104.83 (18.24)	-0.82 (-1.68)	4	106.25 (18.28)	-1.92 (3.76)
Open-Ended Goal Question	6	2.17 (1.33)	-0.44 (1.33)	6	2.33 (1.37)	-0.89 (1.34)

Table 4.3

ARC Descriptive Statistics

	Pre			Post		
Raw Scores	N	Mean (SD)	Skew (Kurtosis)	N	Mean (SD)	Skew (Kurtosis)
Autonomy	6	15 (2.97)	0.4 (-1.7)	4	16.75 (4)	-0.25 (-2.51)
Self-Regulation 1	6	3 (1.9)	0 (2.5)	6	3.5 (2.81)	-0.2 (-2.76)
Self-Regulation 2	6	0.17 (0.41)	2.45 (6)	6	2 (0)	0 (0)
Psychological Empowerment	6	5.67 (0.82)	0.86 (-0.3)	6	6.33 (0.82)	-0.86 (-0.3)
Self-Realization	6	6.17 (0.41)	2.45 (6)	6	6.5 (0.84)	-1.54 (1.43)
Self-Determination Total	6	30.33 (3.39)	-0.15 (-2.56)	4	34.75 (5.25)	1.15 (1.09)

Note. The Self-Determination Total score has a possibility of 50 points.

The results of the RMAs are presented in Table 4.4. The interaction between the pre and post AIR assessment was not statistically significant for any of the subdomains. The interactions between the pre and post ARC assessment was statistically significant for only one subdomain. The second self-regulation subdomain, regarding identifying a transportation goal and stating steps to meet the goal was statistically significant, $F(1, 5) = 121.00$, $p < 0.0001$, which indicates that there is an observable difference in pre and post knowledge of goal setting.

Table 4.4

ANOVA Summary Table for AIR and ARC Standardized Measures

Source	*df*	*F*	Prob > F
AIR			
Capacity	1, 4	0.1388	0.7279
Things I Do	1, 4	0.2566	0.6381
How I Feel	1, 4	0.0051	0.9467
Opportunity	1, 4	1.8715	0.2598
What Happens at School	1, 4	0.1249	0.7439
What Happens at Home	1, 4	2.1412	0.2313
Level of Self-Determination	1, 4	0.4311	0.5508
Goal Setting Question	1, 5	0.2941	0.6109
ARC			
Self-Determination Total	1, 4	2.6736	0.1407
Autonomy	1, 4	0.6340	0.4489
Self-Regulation 1	1, 5	0.1304	0.7255

Self-Regulation 2	1, 5	121.00	<.0001*
Total Self-Regulation	1, 5	2.80	0.1252
Psychological Empowerment	1, 5	2.00	0.1877
Self-Realization	1, 5	0.7692	0.4010

Note: * denotes significance

Social Validity

Using semi-structured interviews, each participant was asked questions regarding their feelings and perceptions of the intervention. Questions were flexibly grouped into five categories: (a) information regarding the goal they set during the intervention, (b) setting future goals, (c) perceptions of self-monitoring checklists, (d) perceptions of the intervention, and (e) recommendations of program. All participants were able to state the goal they set during the ChoiceMaker intervention, and explain why they had chosen the goal (e.g.., "Work-out more, to stay fit"). Interestingly, four participants said they chose their own goal, while one participant said the interventionist helped select their goal, while another said their teacher helped them choose their goal. Three participants chose goals related to exercising more. There is a large push within the program and by parents for this goal in part due to the increased levels of obesity for individuals with intellectual disabilities. All participants stated that they (a) met their goal, (b) were able to explain how they met it, and (c) provided an example of what they did to meet their goal (e.g., "lift more weights"; "Me and my mentor have plans for each day – to meet in my apartment, make tacos together").

Participants were asked if they would want to set another goal. All participants stated they would want to set a goal, and provided examples of the goals they would set. Two participants provided appropriate examples of goals (e.g., "I want to get better at cooking"),

while two participants provided larger career-oriented goals (e.g., “Be an independent living assistant”). The remaining two participants stated goals that were very specific (i.e., “Helping each other with schedules”; “Like watching Brittany Spears”). When asked the follow-up question of “What might be some things you would have to do to meet the new goal”, four of the participants were able to provide specific and appropriate responses (e.g., “Probably need cooking supplies and recipes”; “Be on time, do what your boss asks you to do”).

All participants (100%) stated that they enjoyed using the self-monitoring goal-setting checklist. Participants stated the checklist made things easier and helped them, and two participants stated they liked the pictures on the checklist. Half of the participants stated they believed the checklist helped them in setting goals, checking the pictures off, and helping accomplish chores. Half of the participants said they had used similar checklists before, both at home and at their post-secondary program. Overall, most of the participants (80%) said they like using checklists in general. Reasons for their opinions included “Because you get them in different apartment rooms to help you know what to clean,” “Because the pictures”, “It tells you what to do”, “It’s fun”.

Participants were asked two questions regarding the ChoiceMaker intervention program. All participants were able to list a favorite activity. Activities included the “All About Me” activity completed in lesson 4, using the “checklist”, doing their goal activity, “hanging out” with a peer during the intervention, and identifying personal behaviors. Most participants could not identify what they enjoyed least about the program. One participant said not being able to sleep in, as their intervention time was at 8:00 a.m. three mornings, reflecting more on the intervention time than the intervention itself. One participant did not like doing the charade activity found in lesson 2.

Finally, participants were asked what they would tell the director of the PSE program if he asked what they learned during the intervention. Two participants said they learned how to set goals, along with what they did in their free time. Three participants mentioned they learned something about themselves. Last, participants were asked if they thought the program should be used with other students. All participants said that yes, it should be used with other students. The reasons they gave included to help with independence, learning about skills, it was fun, and to make friends.

CHAPTER FIVE DISCUSSION

The purpose of this study was to examine the effectiveness of a self-monitoring checklist as a component of the ChoiceMaker Curriculum for students with IDD who attend a PSE program on knowledge of personal goal-setting steps. The study endeavored to answer the following three research questions:

1. How does the *ChoiceMaker Curriculum* and the self-monitoring checklist affect post-secondary students' self-determination?
2. To what extent does a self-monitoring checklist with picture prompts increase post-secondary students' knowledge of goal-setting steps?
3. What are students' perceptions of *ChoiceMaker Curriculum* and the self-monitoring checklist program?

In addition to examining the study research questions, implications for practice, limitations, and future directions will also be discussed.

Effectiveness of *ChoiceMaker* Curriculum

Previous empirical research has suggested that the *ChoiceMaker Curriculum* has been shown to increase self-determination in individuals with IDD (Cross et al., 1999; Diegelmann & Test, 2018; German et al., 2000; Martin et al., 2006). Results from this study support previous findings with an overall PEM of this intervention resulting in an 0.70, indicating a moderately effective intervention at increasing participants' knowledge on the goal-setting steps. Standardized measures resulted in only one subdomain being statistically significant. The significant score focused on individuals setting a transportation goal, and stating up to four goals they would need to meet to get the transportation goal (i.e., driving a car; taking driver's training, getting a driver's license, saving money to buy a car). The curriculum and probe taught

participants to think about requirements to meet a goal, as a result participants were able to better understand this particular question when asked what were four requirements needed to meet their transportation goal. This significant result would indicate that the intervention, self-monitoring checklist, and explicit instruction was effective in increasing individual knowledge regarding setting a goal and requirements. However, while the standardized measures of this study were not statistically significant, PEM scores, social validity responses and overall growth shown through the multiple-baseline single case research design lend support for the effectiveness of the program and added instructional components of the self-monitoring checklist and explicit instruction.

The standardized measures used in this study are considered global measures, and the brief dosage of the intervention played a large role in overall non-significant findings. The average dosage of the intervention provided during the present study was 247 minutes, or just over four hours. This dosage is significantly less than previously published research on different *ChoiceMaker* curricula (i.e., *Self-Directed IEP, Choosing Employment Goals*). The published studies (Allen et al., 2001; Cross et al., 1999; German et al., 2000; Martin et al., 2006; Seong et al., 2015) included interventions that lasted an average of 592 minutes, or just about 10 hours (range of 360-840 minutes or 6-14 hours). As the intervention of the present study was considerably shorter, it is not surprising that self-determination skills were not as improved as in previous studies.

The overall dosage was shorter for several reasons. First, groups in the present study were much smaller (i.e., two participants) than previously published studies, where groups ranged from four to a full class size (e.g., 25). A large part of the *ChoiceMaker Curriculum* involves group or partner work. With larger groups, the interventionist would act as a leader and supervise

pairs and small groups. However, with the small participant to interventionist ratio (2:1) of the present study, there was only one pair to supervise. Thus, many lessons were completed quicker than they would with larger groups. Additionally, the smaller group limited the discussion. With only two participants, discussion was sometimes stagnant, and the interventionist had to probe to get the discussion started and flowing throughout different sections. Difficulty with discussions was especially apparent for the group of David and Benjamin, who struggled to maintain dialogue with the interventionist and each other. Perhaps in larger groups, ensuing conversations and discussions would be more abundant resulting in more participant involvement, thus increasing the dosage time. Additionally, out of all six participants David and Benjamin had the lowest IQs (42 and 40 respectively). Additionally, David had the second lowest adaptive behavior score. Perhaps the combination of the lower IQ and adaptive behavior interfered with the intervention's effectiveness. It may be of importance to note that explicit instruction created the largest increase in scores for David. Future research should continue to look at the impact that IQ and adaptive behavior scores have on the effectiveness of interventions.

Interestingly, while participants learned about new activities and discussed their personal interests it became apparent that many relied on their parents, teachers, or interventionist to identify personal goals. Throughout the various intervention groups participants stated several times that their mom or teacher had told them what they should be setting as their goal, or told them what they should be doing in their free time. Displaying behaviors that correspond with their own preferences, abilities, or interests, and independently or free from excessive external pressure (Deci & Ryan, 1987; Wehmeyer, 1997) is a way of expressing individual autonomy. Educators need to find a balance between helping guide individuals with IDD to explore individual interests and applying external pressure, no matter how unintentional. Parents also

may benefit from being educated on the benefits of activities to increase autonomous behaviors in their child with IDD, and how to guide their child without external pressure. Self-realization includes self-knowledge which is developed through experience with and understanding of an individual's environment, which can be affected through evaluating others, reinforcements, and causes of specific behavior (Wehmeyer & Garner, 2003). As many of the participants struggled with identifying interests that were personal to them, not surprisingly, self-realization scores were not significantly changed during the intervention.

Effectiveness of Self-Monitoring Checklist

Self-monitoring checklists have been shown as a useful and effective learning strategy (Diegleman & Test, 2018). Findings from the current study support the effectiveness of the self-monitoring tool with the continued use of prompts. The addition of the self-monitoring checklist increased participants' responses on average by only one point. Observations and findings showed participants did not refer to the self-monitoring sheet during the second phase of the study (the self-monitoring checklist phase) without prompting. Participants required prompting and explicit instruction on how to use the self-monitoring checklist. After explicit instruction regarding the self-monitoring checklist and the goal-setting steps participants were able to correctly answer all probe questions. Explicit instruction and the use of the self-monitoring checklist increased participants' average probe scores by 5.2 points. Following explicit instruction, most participants continued to not refer to the self-monitoring checklist, questioning whether the self-monitoring checklist or the explicit and repeated instruction resulted in the increase of participant responses on the probe.

Due to the impact that explicit instruction had on increasing participants responses to the probe, it's important to discuss the implications of such instruction on participant success.

Individuals with IDD typically display learning difficulties in regard to attention, memory, language development and comprehension (Alloway, 2010; Heward, 2009). As a result of these difficulties, explicit instruction and repeated instruction are common practice. Results from this study support the need for both explicit and repeated instruction. While each of the goal-setting steps was taught, practiced, and completed within the intervention of the *ChoiceMaker*, nearly all (80%) of the participants required explicit instruction on the self-monitoring sheet and each of the goal-setting steps. Additionally, after delivering explicit instruction, several of the participants (Livy and David) needed the explicit instruction repeated.

Participant Perceptions

Considering social validity in the implementation of an intervention is important for sustainability, real-world applications, and overall adoption (Snodgrass et al., 2018). As a result, a need for empirical studies to use participants with IDD to include social validity measures is needed. Participants in this study shared overwhelmingly positive views regarding both the curriculum and the self-monitoring checklist. While some of the participants were not able articulate reasons of support for their answers, many were able to describe how and why the checklist in particular was helpful. Participant responses can be used to shape future instructional interventions. For example, participants stated they enjoyed the pictures on the checklist along with the ability to "check-off" each step. Strategies and interventions utilizing checklists may want to include visual representations of each step along with an option to check-off each step when completed.

Limitations

Findings from this study should be interpreted with caution as there are several limitations. First, while the standardized measures used with the participants had been normed

and developed with the IDD population, the questions still appeared to be too complex for the majority of the participants in this study. For example, one of the self-regulation questions asked participants to explain how they would be elected as a president of a college club. This particular question was answered 12 times, and 11 of those answers received scores of zero. Second, the probes and self-monitoring checklist were researcher created. While they were based on a previous empirical study (Diegleman & Test, 2018), the researcher created measures used in this study had not been vetted by outside individuals. Third, the sample size is a limitation and replications are needed with additional IDD populations in order to establish more generalizable results. Additionally, no generalization data was gathered, which limits the examination of the intervention to other areas of the participants' lives. Finally, due to the COVID-19 outbreak, final participants (David and Benjamin) had to finish their intervention virtually. Furthermore, Benjamin asked to be dropped from the study once he returned home, thus not entering the SMC and EI phase. Finally, the lead researcher was the interventionist as well, instead of the participants' normal classroom instructor. Instructors of the current PSE program do not have a set class for self-determination instruction, and have a full teaching load. As a result, for this study the researcher was the interventionist.

Implications for Practice

Due to the limited number of studies conducted with participants with IDD attending a PSE program, results from this study can inform and encourage further research. The study framework based on *ChoiceMaker: Choosing Personal Goals* (Martin & Marshall, 2016) and the incorporation of a self-monitoring checklist (Diegleman & Test, 2018) provide a structure of teaching self-determination skills. Explicit instruction was needed for 80% of the participants to master the probe. Future practices and interventions including the use of evidence-based

practices (i.e., a self-monitoring sheet), should continue to include explicit instruction. Lastly, social validity perceptions and scores should be taken into consideration when developing and evaluating instructional practices. As student and teacher positive perceptions greatly impact the sustainability, real-world applications, and overall adoption of any intervention (Snodgrass et al., 2018).

Future Research

Future research focused on PSE programs for individuals with IDD, self-determination, and self-monitoring checklists should continue in several ways. First, future studies should be extended to ensure that the intervention is repeated. The *ChoiceMaker* is intended to be repeated as participants complete goals, set new goals, and then take steps to complete the newly developed goal. Extending the intervention (increasing the dosage of the intervention) could be used to examine the impact of repeated instruction and exposure to more personal interests and goals, thus having a larger impact on self-determination skills of individuals. While this study was not intended to considerably change the *ChoiceMaker* intervention, future research could focus on incorporating more systematic changes to the self-determination curriculum. Many of the participants struggled to name personal interests, and often repeated the same two or three. Future research could investigate if providing participants with various choices for personal goals (i.e., participate in a new physical exercise, make plans with friends, take an art class, join a college club [e.g., garden club, board game club]) would increase self-determination skills. As a result of these findings, future research focused on individuals with IDD should include explicit and repeated instruction within their interventions and instruction. Future studies could include a more systematic format for providing explicit instruction in the purpose, modeling, and practice of using a self-monitoring checklist. Lessons focusing on explicitly teaching a self-

monitoring checklist could be created and added in as additional sessions to the *ChoiceMaker* curriculum.

Different and various statistical analyses should be used on future replications of this study. The role that participant language plays in the intervention, probes, and self-monitoring checklists needs to be more thoroughly examined. Adaptive skills of participants should also be more thoroughly examined as to their impact on participant outcomes. Conducting a structure equation model may be useful to identify individual factors that may have impacted individual performance. Additionally, incorporating an interview protocol before intervention to examine participant knowledge and perhaps have a baseline of language ability may be useful for future replication.

Conclusions

There is a great need to identify self-determination interventions for individuals with IDD who attend the ever-growing number of PSE programs. While we know that self-determination skills increase life outcomes for individuals with IDD (Shogren et al., 2015; Shogren & Shaw, 2016; Wehmeyer & Schwartz, 1998; Wehmeyer & Palmer, 2003; Wehmeyer et al., 2013), there is a paucity of research in the area of self-determination interventions and individuals with IDD attending PSE programs. Findings from this study support that through the use of explicit instruction, self-monitoring checklist, and the *ChoiceMaker*: *Personal Goal Setting* curriculum, individuals with IDD who attended a PSE program were able to improve their self-determination skills. Descriptive data show that improvements were made in participants' self-determination skills. Additionally, participants reported that the intervention was enjoyable, and that the skills they learned were useful. Based on the favorable findings of this study, further research should continue to explore the use of explicit instruction, self-monitoring checklist, and the

ChoiceMaker: *Personal Goal Setting* curriculum with individuals with IDD in a variety of settings.

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Appendix A. Curriculum Overview

Table A1

Choosing Personal Goals Lessons and Included Content

Lesson (Length/Session)	Goal	Objective	Content Synopsis
1. Introduction and How I Am With Others (60 minutes/Session 1)	SSL	EPSL	Review transition areas, introduce personal areas, develop class and group expectations, and practice working in a group
2. Introduce Groups (45 minutes/Session 1)	SI SSL	EPI EPSL	Introduce groups, categorize groups, discuss needs group fulfills
3. Personal Activities (50-60 minutes/Session 2)	SI SSL	EPI EPSL	Define personal areas (e.g., hobbies, leisure skills, health)
4. What's Important to Me and Project Presentations (2 hours; two class periods/Session 2 & Session 3)	SI	EPI	Complete forms regarding what is important to them, and present projects describing what they do
5. What I Do Summary (50 minutes/Session 3)	SI	EPI	What I do summaries and group reflection
6. What I Want to Change (40 minutes/Session 4)	SI SSL	EPI EPSL	Summary of what students want to change in the areas of relationships, hobbies, and health
7. Ways to Change (50 minutes/Session 4)	SI SSL	EPI EPSL	Brainstorm how to bring about change, ways to make changes, brainstorm how to find activities

Note. SI = Student interests, SSL = Student skills and limits, SG = Student Goals; EPI = Express personal interests, EPSL = Express personal skills and limits, IOCPG

Lesson (Length)	Goal	Objective	Content Synopsis
8. School and Community Resources (60-90 minutes/Session 5)	SI SSL	EPI EPSL	Use school and community information to find activities or ones that will help them make their identified changes, students choose one to try
9. Getting Information (90 minutes; two class periods/Session 6)	SI SSL	EPI EPSL	What is needed to do the activity they choose, research into the activity they choose
10. Choosing Goals (90 minutes/Session 7)	SI SSL SG	EPI EPSL IOCPG	Introduce choosing goal process, guided practice
11. New Activity Evaluation (50 minutes/Session 8)	SI	EPI	Evaluate new activity, guided practice

Note. SI = Student interests, SSL = Student skills and limits, SG = Student Goals; EPI = Express personal interests, EPSL = Express personal skills and limits, IOCPG

Appendix B. Self-Monitoring Checklists

Figure B1

Probe Self-Monitoring Checklist

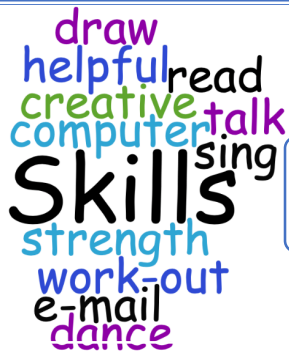
Do I know my interests?

Do I have the skills to meet the requirements?

Do I know what is required to do this?

Do I know my limits?

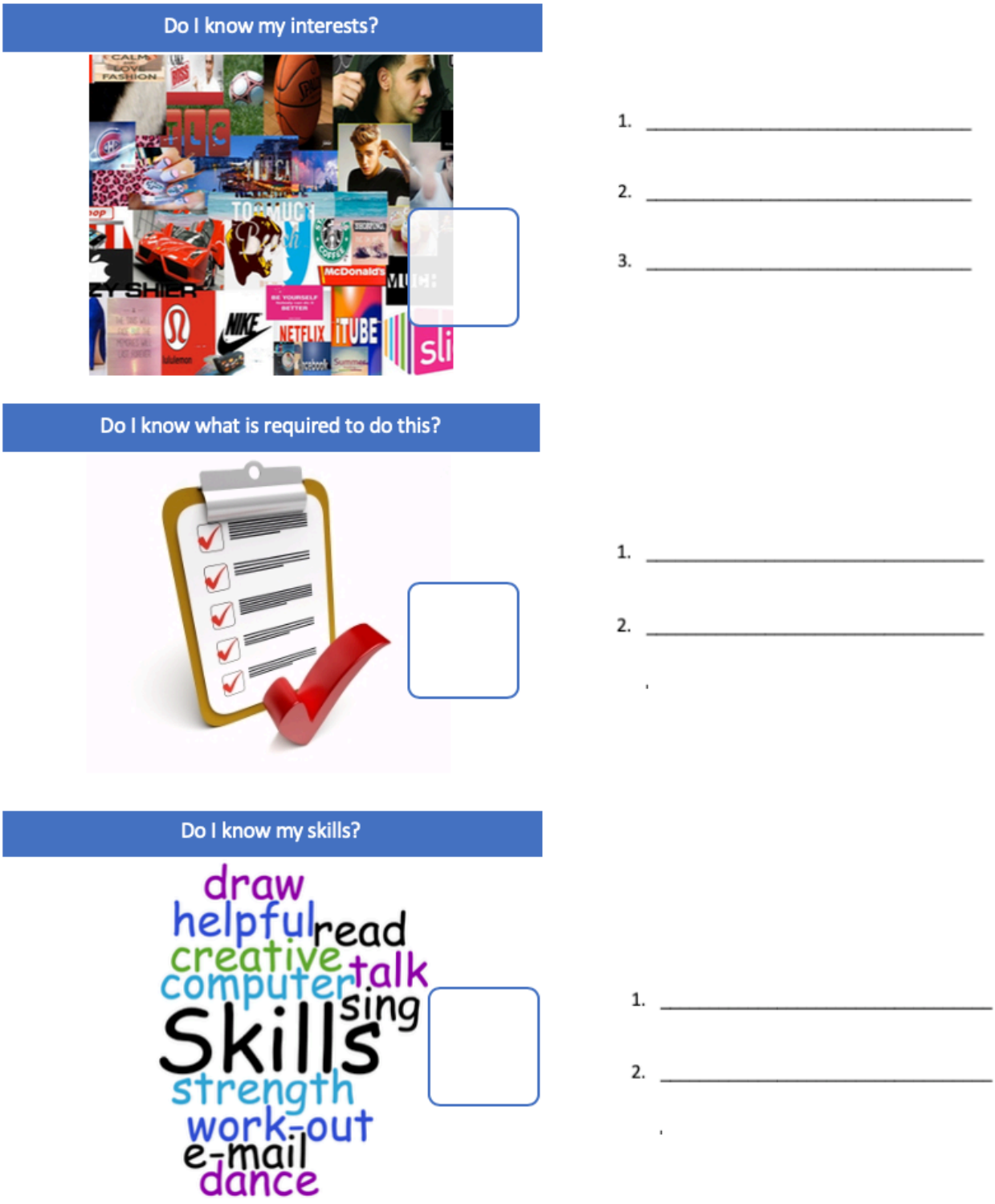
Do I know my skills?



Do my limits interfere with the requirements?

Figure B2

Instruction Self-Monitoring Checklist



Do I have the skills to meet the requirements?

YES NO

Why? _____

_____

_____

Do I know my limits?

1. _____

2. _____

Do my limits interfere with the requirements?

YES NO

Why? _____

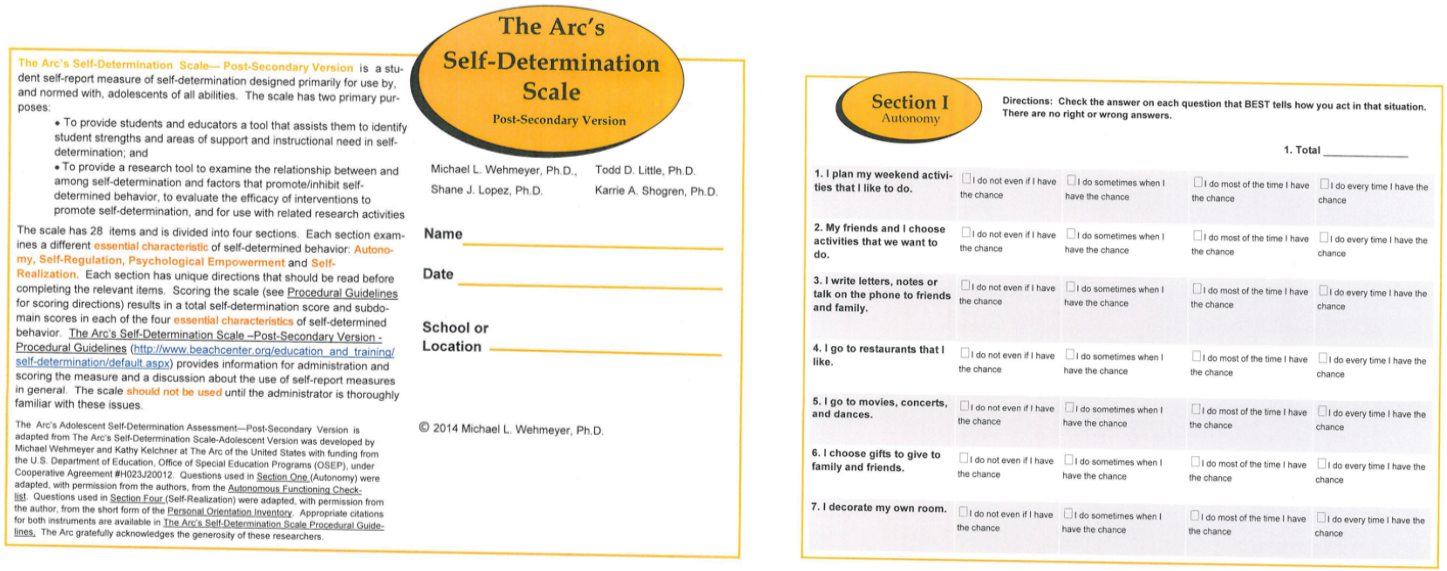
_____

_____

Appendix C. Dependent Measures

Figure C1

Wehmeyer, M. L., Little, T. D., Lopez, S. J., Shogren, K. A. (2014). The Arc's Self-Determination Scale: Post-Secondary Version



The Arc's Self-Determination Scale
Post-Secondary Version

The Arc's Self-Determination Scale— Post-Secondary Version is a student self-report measure of self-determination designed primarily for use by, and normed with, adolescents of all abilities. The scale has two primary purposes:

- To provide students and educators a tool that assists them to identify student strengths and areas of support and instructional need in self-determination; and
- To provide a research tool to examine the relationship between and among self-determination and factors that promote/inhibit self-determined behavior, to evaluate the efficacy of interventions to promote self-determination, and for use with related research activities

The scale has 28 items and is divided into four sections. Each section examines a different essential characteristic of self-determined behavior: Autonomy, Self-Regulation, Psychological Empowerment and Self-Realization. Each section has unique directions that should be read before completing the relevant items. Scoring the scale (see Procedural Guidelines for scoring directions) results in a total self-determination score and subdomain scores in each of the four essential characteristics of self-determined behavior. The Arc's Self-Determination Scale –Post-Secondary Version - Procedural Guidelines (http://www.beachcenter.org/education_and_training/self-determination/default.aspx) provides information for administration and scoring the measure and a discussion about the use of self-report measures in general. The scale should not be used until the administrator is thoroughly familiar with these issues.

The Arc's Adolescent Self-Determination Assessment—Post-Secondary Version is adapted from The Arc's Self-Determination Scale-Adolescent Version was developed by Michael Wehmeyer and Kathy Kelchner at The Arc of the United States with funding from the U.S. Department of Education, Office of Special Education Programs (OSEP), under Cooperative Agreement #H023J20012. Questions used in Section One (Autonomy) were adapted, with permission from the authors, from the Autonomous Functioning Checklist. Questions used in Section Four (Self-Realization) were adapted, with permission from the author, from the short form of the Personal Orientation Inventory. Appropriate citations for both instruments are available in The Arc's Self-Determination Scale Procedural Guidelines. The Arc gratefully acknowledges the generosity of these researchers.

Michael L. Wehmeyer, Ph.D., Todd D. Little, Ph.D.
Shane J. Lopez, Ph.D. Karrie A. Shogren, Ph.D.

Name _____

Date _____

School or Location _____

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Section I
Autonomy

Directions: Check the answer on each question that BEST tells how you act in that situation. There are no right or wrong answers.

1. Total _____

1. I plan my weekend activities that I like to do.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
2. My friends and I choose activities that we want to do.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
3. I write letters, notes or talk on the phone to friends and family.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
4. I go to restaurants that I like.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
5. I go to movies, concerts, and dances.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
6. I choose gifts to give to family and friends.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
7. I decorate my own room.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance

Section IIA
Self-Regulation

Directions: Each of the following questions tells the beginning of a story and how the story ends. Your job is to tell what happened in the middle of the story, to connect the beginning and the end. Read the beginning and ending for each question, then fill in the BEST answer for the middle of the story. There are no right or wrong answers. Remember, fill in the answer that you think BEST completes the story.

2A. Interpersonal cognitive problem-solving.

8. **Beginning**: You are meeting with your education coach and academic advisor. You want to take a class where you can learn skills to help you work in hotel management. Your education coach wants you to take the Family and Child Care class. You can only take one of the classes.

Middle:

_____
_____
_____
_____
_____

Ending: The story ends with you taking a class where you will learn hotel management.

Story Score _____

9. **Beginning**: You hear a friend talking about a new job opening at the local book store. You love books and want a job. You decide you would like to work at the bookstore.

Middle:

_____
_____
_____
_____
_____

Ending: The story ends with you working at the book store.

Story Score _____

10. **Beginning**: Your friends are acting like they are mad at you. You are upset about this.

Middle:

_____
_____
_____
_____
_____

Ending: The story ends with you and your friends getting along just fine.

Story Score _____

11. **Beginning**: You go to your English class one morning and discover your English book is not in your backpack. You are upset because you need that book to do your homework.

Middle:

_____
_____
_____
_____
_____

Ending: The story ends with you using your English book for homework.

Story Score _____

12. **Beginning**: You are in a club at your college . The club advisor announces that the club members will need to elect new officers at the next meeting. You want to be the president of the club.

Middle:

_____
_____
_____
_____
_____
_____

Ending: The story ends with you being elected as the club president.

Story Score _____

13. **Beginning**: You are at a new course at college and you don't know anyone. You want to have friends.

Middle:

_____
_____
_____
_____
_____
_____

Ending: The story ends with you having many friends in the new course.

Story Score _____

IIB. Goal setting and task performance

Directions: The next three questions ask about your plans for the future. Again, there are no right or wrong answers. For each question, tell if you have made plans for that outcome and, if so, what those plans are and how to meet them.

14. What type of transportation do you plan to use after you leave your college or training experience?

☐ I have not planned for that yet.

☐ I plan to use _____

List four things you should do to meet this goal:

1) _____
2) _____
3) _____
4) _____

Section III
Psychological Empowerment

Directions: Check the answer that BEST describes you. There are no right or wrong answers.

15. ☐ I usually agree with people when they tell me I can't do something...or

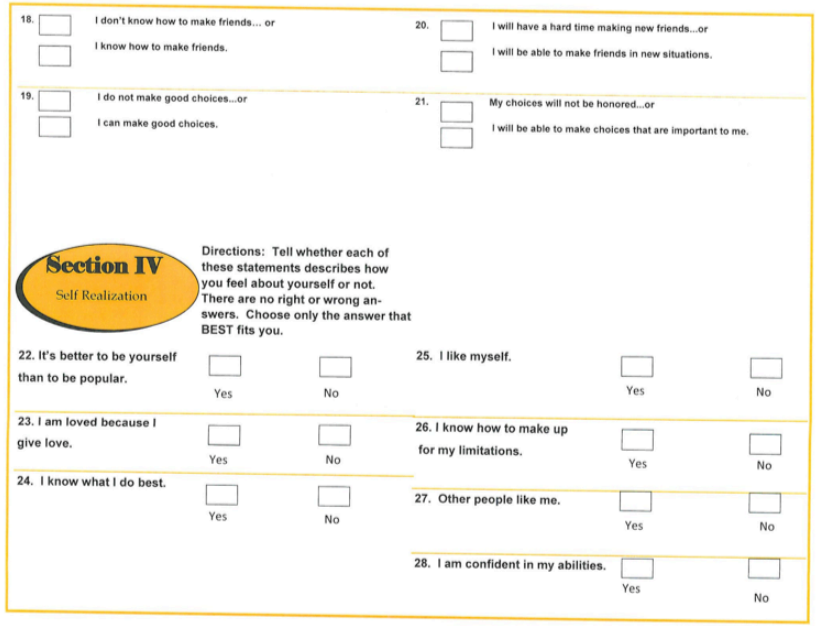
☐ I tell people when I think I can do something that they tell me I can't

16. ☐ Trying hard in school doesn't do me much good...or

☐ Trying hard at school will help me get a good job.

17. ☐ It is no use to keep trying because that won't change things...or

☐ I keep trying even after I get something wrong.



18. ☐ I don't know how to make friends... or
☐ I know how to make friends.

19. ☐ I do not make good choices...or
☐ I can make good choices.

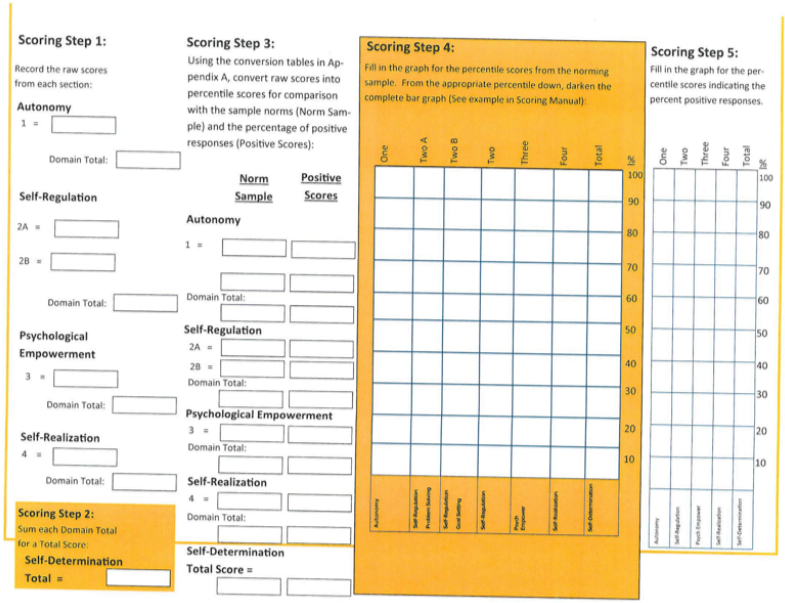
20. ☐ I will have a hard time making new friends...or
☐ I will be able to make friends in new situations.

21. ☐ My choices will not be honored...or
☐ I will be able to make choices that are important to me.

Section IV
Self Realization

Directions: Tell whether each of these statements describes how you feel about yourself or not. There are no right or wrong answers. Choose only the answer that BEST fits you.

	Yes	No
22. It's better to be yourself than to be popular.	☐	☐
23. I am loved because I give love.	☐	☐
24. I know what I do best.	☐	☐
25. I like myself.	☐	☐
26. I know how to make up for my limitations.	☐	☐
27. Other people like me.	☐	☐
28. I am confident in my abilities.	☐	☐



Scoring Step 1:
Record the raw scores from each section:

Autonomy
1 = ☐
Domain Total: ☐

Self-Regulation
2A = ☐
2B = ☐
Domain Total: ☐

Psychological Empowerment
3 = ☐
Domain Total: ☐

Self-Realization
4 = ☐
Domain Total: ☐

Scoring Step 2:
Sum each Domain Total for a Total Score:
Self-Determination Total = ☐

Scoring Step 3:
Using the conversion tables in Appendix A, convert raw scores into percentile scores for comparison with the sample norms (Norm Sample) and the percentage of positive responses (Positive Scores):

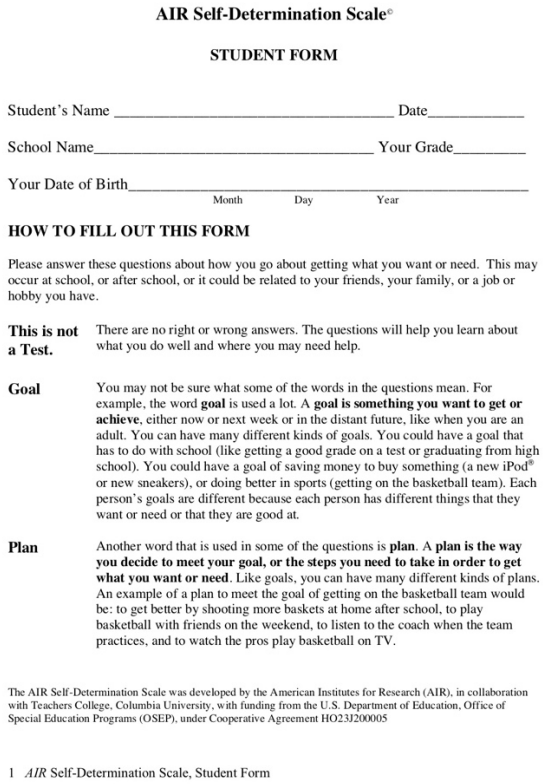
	Norm Sample	Positive Scores
Autonomy		
1 =	☐	☐
Domain Total:	☐	☐
Self-Regulation		
2A =	☐	☐
2B =	☐	☐
Domain Total:	☐	☐
Psychological Empowerment		
3 =	☐	☐
Domain Total:	☐	☐
Self-Realization		
4 =	☐	☐
Domain Total:	☐	☐
Self-Determination Total Score =	☐	☐

Scoring Step 4:
Fill in the graph for the percentile scores from the norming sample. From the appropriate percentile down, darken the complete bar graph (See example in Scoring Manual):

Scoring Step 5:
Fill in the graph for the percentile scores indicating the percent positive responses.

Figure C2

Wolman, Campeau, Dubois, Mithaug, & Stolarski (1994). AIR Self-Determination Scale and user guide. Palo Alto, CA: American Institute for Research.



AIR Self-Determination Scale©

STUDENT FORM

Student's Name _____ Date_____

School Name_____ Your Grade_____

Your Date of Birth_____
Month Day Year

HOW TO FILL OUT THIS FORM

Please answer these questions about how you go about getting what you want or need. This may occur at school, or after school, or it could be related to your friends, your family, or a job or hobby you have.

This is not a Test. There are no right or wrong answers. The questions will help you learn about what you do well and where you may need help.

Goal You may not be sure what some of the words in the questions mean. For example, the word **goal** is used a lot. A **goal is something you want to get or achieve**, either now or next week or in the distant future, like when you are an adult. You can have many different kinds of goals. You could have a goal that has to do with school (like getting a good grade on a test or graduating from high school). You could have a goal of saving money to buy something (a new iPod® or new sneakers), or doing better in sports (getting on the basketball team). Each person's goals are different because each person has different things that they want or need or that they are good at.

Plan Another word that is used in some of the questions is **plan**. A **plan is the way you decide to meet your goal, or the steps you need to take in order to get what you want or need**. Like goals, you can have many different kinds of plans. An example of a plan to meet the goal of getting on the basketball team would be: to get better by shooting more baskets at home after school, to play basketball with friends on the weekend, to listen to the coach when the team practices, and to watch the pros play basketball on TV.

The AIR Self-Determination Scale was developed by the American Institutes for Research (AIR), in collaboration with Teachers College, Columbia University, with funding from the U.S. Department of Education, Office of Special Education Programs (OSEP), under Cooperative Agreement HO23J200005

1 *AIR* Self-Determination Scale, Student Form

HOW TO MARK YOUR ANSWERS

EXAMPLE QUESTION:
I check for errors after completing a project.

EXAMPLE ANSWER:
Circle the number of the answer which tells what you are most like:
(Circle **ONLY ONE** number).

1 Never……student **never** checks for errors.

2 Almost Never……student **almost never** checks for errors.

3 Sometimes……student **sometimes** checks for errors.

4 Almost Always……student **almost always** checks for errors.

5 Always……student **always** checks for errors.

REMEMBER

There are NO right or wrong answers. This will not affect your grade. So please think about each question carefully before you circle your answer.

THINGS I DO

1. I know what I need, what I like, and what I'm good at.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
2. I set goals to get what I want or need. I think about what I am good at when I do this.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
			Things I Do – Total Items 1 + 2		
3. I figure out how to meet my goals. I make plans and decide what I should do.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
4. I begin working on my plans to meet my goals as soon as possible.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
			Things I Do – Total Items 3 + 4		
5. I check how I'm doing when I'm working on my plan. If I need to, I ask others what they think of how I'm doing.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
6. If my plan doesn't work, I try another one to meet my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
			Things I Do – Total Items 5 + 6		

Please go on to the next page ⇒

HOW I FEEL

1. I feel good about what I like, what I want, and what I need to do.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
2. I believe that I can set goals to get what I want.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
How I Feel – Total Items 1 + 2					
3. I like to make plans to meet my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
4. I like to begin working on my plans right away.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
How I Feel – Total Items 3 + 4					
5. I like to check on how well I'm doing in meeting my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
6. I am willing to try another way if it helps me to meet my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
How I Feel – Total Items 5 + 6					

Please go on to the next page ⇒

WHAT HAPPENS AT SCHOOL

1. People at school listen to me when I talk about what I want, what I need, or what I'm good at.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
2. People at school let me know that I can set my own goals to get what I want or need.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
What Happens at School – Total Items 1 + 2					
3. At school, I have learned how to make plans to meet my goals and to feel good about them.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
4. People at school encourage me to start working on my plans right away.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
What Happens at School – Total Items 3 + 4					
5. I have someone at school who can tell me if I am meeting my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
6. People at school understand when I have to change my plan to meet my goals. They offer advice and encourage me when I'm doing this.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
What Happens at School – Total Items 5 + 6					

Please go on to the next page ⇒

WHAT HAPPENS AT HOME

1. People at home listen to me when I talk about what I want, what I need, or what I'm good at.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
2. People at home let me know that I can set my own goals to get what I want or need.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at Home – Total Items 1 + 2	
3. At home, I have learned how to make plans to meet my goals and to feel good about them.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
4. People at home encourage me to start working on my plans right away.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at Home – Total Items 3 + 4	
5. I have someone at home who can tell me if I am meeting my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
6. People at home understand when I have to change my plan to meet my goals. They offer advice and encourage me when I'm doing this.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at Home – Total Items 5 + 6	

Please go on to the next page ⇒

PLEASE WRITE YOUR ANWERS TO THE FOLLOWING QUESTIONS…

Give an example of a goal you are working on.

_____

_____

_____

_____

_____

What are you doing to reach this goal?

_____

_____

_____

_____

_____

How well are you doing in reaching this goal?

_____

_____

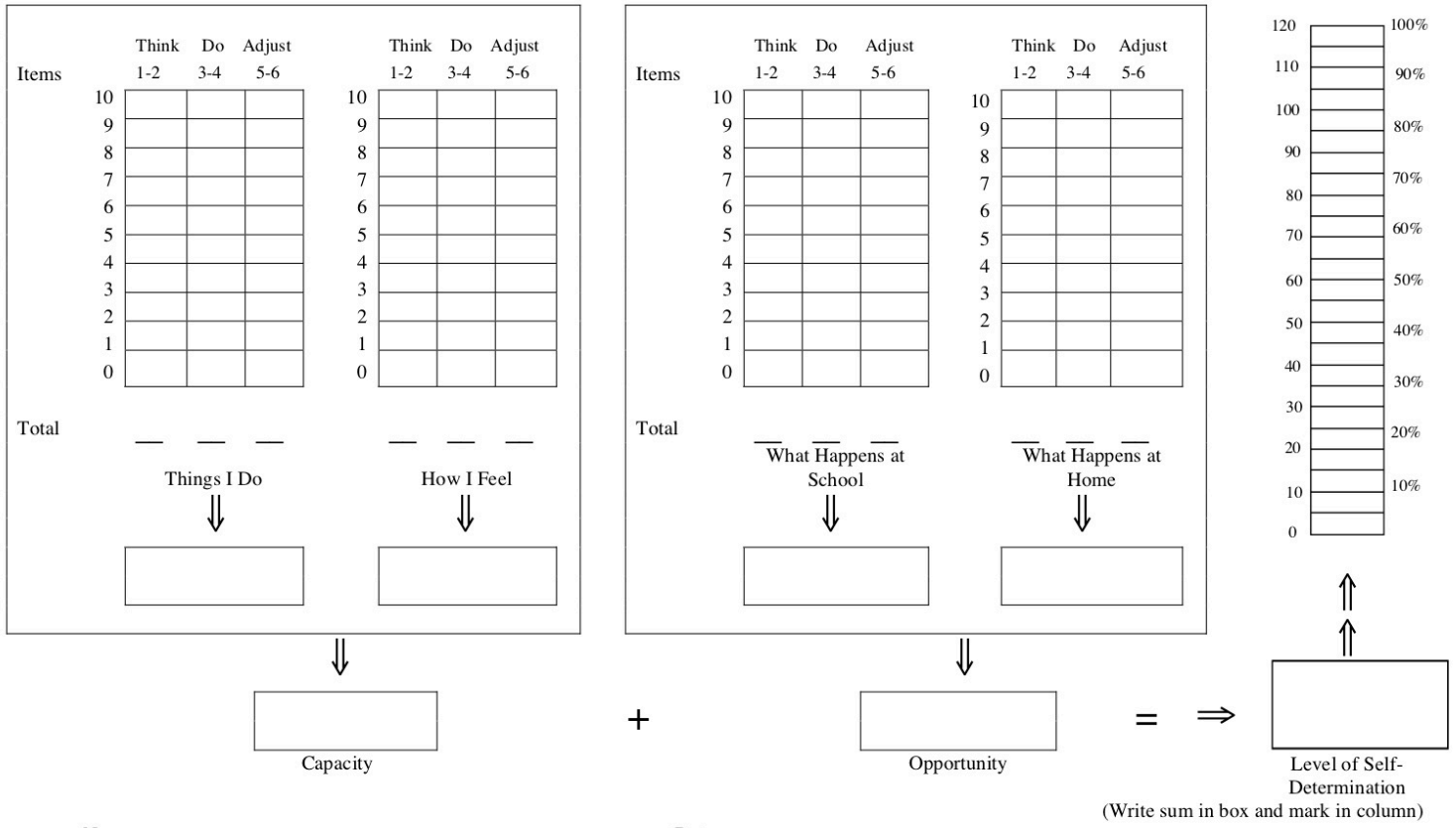
_____

_____

_____

THANK YOU!

The AIR Self-Determination Profile
Student Form



Name_____ Date_____

Table C1

Probe Checklist

Question 1	0 – Points	1 – Point	2 – Points	3 -Points	Total Points
Tell me three things you like to do in your free time?	No answer, or non-related	Nonspecific, or highly unlikely	Related, reasonable, non-expansive	Reasonable, related, and expansive	Score last interest given. /3
1st Personal Interest					
2nd Personal Interest					
3rd Personal Interest					
Question 2	0 – Points	1 – Point	2 – Points	3 -Points	Total Points
Tell me two things needed to "the last personal interest they shared"	No answer, or non-related	Nonspecific, or highly unlikely	Related, reasonable, non-expansive	Reasonable, related, and expansive	/6
1st Requirement					/3
2nd Requirement					/3
Question 3	0 – Points	1 – Point	2 – Points	3 -Points	Total Points

Tell me two skills you have or use for "the last interest they shared".	No answer, or non-related	Nonspecific, or highly unlikely	Related, reasonable, non-expansive	Reasonable, related, and expansive	/6
1st Skill					/3
2nd Skill					/3
Question 4	0 – Points	1 – Point	2 – Points	3 -Points	Total Points
Do you have the skills that are needed to "last interest shared"?	No answer, or non-related	Nonspecific, or highly unlikely	Related, reasonable, non-expansive	Reasonable, related, and expansive	/3
					/3
Question 5	0 – Points	1 – Point	2 – Points	3 -Points	Total Points
Tell me two things that might keep you from "last interest they shared"?	No answer, or non-related	Nonspecific, or highly unlikely	Related, reasonable, non-expansive	Reasonable, related, and expansive	/6
1st Limit					/3
2nd Limit					/3
Question 6	0 – Points	1 – Point	2 – Points	3 -Points	Total Points
Do "the limits they shared" interfere with what is needed to "your last interest shared"?	No answer, or non-related	Nonspecific, or highly unlikely	Related, reasonable, non-expansive	Reasonable, related, and expansive	/3

					/3
			Total Points:		/27

Figure C3

Interview Protocol - Student

What did you set as your goal during the "Personal Goals" class?

a. Why did you set this goal?
b. Did anyone help you choose this goal?

Did you meet your goal?

a. Why or why not?
b. What kinds of things did you have to do to meet your goal?

Would you set another goal?

a. What would the goal be?
b. What might be some things you would have to do to meet the new goal?

Did you like using the self-monitoring goal-setting checklist?

a. Why?
b. Why not?

If respondent says it "helped" them, or it was "easier" – follow-up questions:

a. What in particular did you think it helped you with? or What did it make "easier" to do?
b. Why do you think it helped you? or Why do you think it made it "easier"?

Have you used other checklists like the one we used before?

a. Where?

Do you like using checklists? Why or why not?

During this class you participated in lots of different activities.

a. What did you like the most?
b. What did you like the least?

If Dr. Ryan or your parents were to ask you about what you learned in the "Personal Goals" class using the self-monitoring goal-setting checklist, what would you say?

Do you think that this program should be used with other LIFE students?

Appendix D. Treatment Fidelity

Figure D1

Fidelity of Intervention Checklist

ChoiceMaker – Lesson 8

Observer: _____ Date: _____

		Completed	Not Completed	Notes
Review				
	Review ways students can find out about activities in their school and community.			
	Go over the list from the last brainstorming lesson.			
	Today we are going to look at some services and activities available in our school and community.			
	As a part of this unit, you will need to try at least one new activity that will help you make the change you have chosen.			
College Resources				
	Introduce resources on campus:			
	CAPS			
	FIKE			
	Clemson.edu			
Community Resources				
	Ask students to take out their Summary of Changes Worksheet from Lessons 6 and 7.			
	Present the following information:			
	There is a lot of information about activities and services in our community.			
	We will use our laptops to find different resources.			
	You'll get ideas for your activity choice by using these resources.			
Guided Practice				

	Put the Summary of Changes Worksheet transparency from Lessons 6 & 7 on the overhead.			
	Complete the Lesson 8 column as you present the following information:			
	In the area of relationships, I said I want to meet new people.			
	I found out about some art classes today online.			
		Complete	Not Complete	Notes
	I really enjoy art and I could sign-up for an art class. That way I would meet some people who have the same interest as I do.			
	In the area of hobbies, talents, and recreation, I said I would like to try fitness dance.			
	On Fike's webpage I can find all kinds of information on dance classes.			
	Maybe I could invite my friends along.			
	In the area of health and wellness, I said I could take a class to learn to de-stress.			
	The internet again shows me places that I can take classes to learn how to do this.			
	Remind students they may have more than one activity in each area in the Lesson 6 column.			
	Similarly, they may not find an activity for one of their areas.			
Complete Lesson 8 Column on the Summary of Changes Worksheet				
	Remind students they will be required to do at least one activity to help them make the change they wanted.			
	If you have a small class, review the changes each student wants to make.			

	As students look through the materials they might find an activity for someone else.			
	Let's look through some internet resources together to see if we can find resources for both of your interests.			
	Write them on your worksheet in the Lesson 8 column.			
	Using the resources the teacher provided, students will explore and write down activities that could help bring about their desired change.			
	Give students time to find activities that interest them, preferably ones they haven't done before.			
	Students may work in groups and help each other find activities that would help them make their changes.			
		Complete	Not Complete	Notes
Choose Activity to Try				
	Instruct students to look at the activities they found in the school or community to help them make the changes they want to make.			
	Instruct students to choose one activity to try in the next couple of weeks.			
Wrap-up				
	Have students share a few of the activities they found.			
	What activities did you find that might help you make the changes you want?			
	What one did you choose to try?			
	Did you find anything interesting you might want to try that didn't relate to any of your changes?			
	Maybe you could try them sometime, too.			
	In the next lesson, you will be looking at the requirements for the activity you have chosen.			
	Later you will try the activity.			