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## Essential Roots: Planting Seeds for a Bright Future; a Pilot Implementation of Transitional Service that Promotes Nutritional Health and Business Skills for Students with IDD

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ESSENTIAL ROOTS: PLANTING SEEDS FOR A BRIGHT FUTURE  
A PILOT IMPLEMENTATION OF TRANSITIONAL SERVICE THAT PROMOTES NUTRITIONAL  
HEALTH AND BUSINESS SKILLS FOR STUDENTS WITH IDD

by

Jennybeth Seabrook Hendrick

A thesis submitted to the faculty of The University of Mississippi in partial  
fulfillment of the requirements of the Sally McDonnell Barksdale Honors College.

Oxford  
May 2014

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### **Abstract**

Too many men and women with intellectual and/or developmental disabilities (IDD) are unable to live autonomously due to economic instability and the lack of knowledge to successfully make appropriate and healthy life choices. To improve attainment of financial independence and autonomous living, transitional services must be implemented into grade schools so that adolescents can master basic life skills to help their future quality of life. *Essential Roots: Planting Seeds for a Bright Future*, a pilot transitional program and evaluation was conducted in a classroom at the Scott Child Development Center, Oxford, MS. The goal of the non-randomized, controlled research study was to investigate ways in which transitional services used in special education programs can combine on nutrition choices and business skills to help aid independent living after high school graduation. *Essential Roots: Planting Seeds for a Bright Future* demonstrates how time, patience, and attention on IDD students through such transitional services can affect their future. Tools for successful independence were taught through lessons in nutrition, communication, and money exchanging. Resulting from this program, Scott Center IDD students will hopefully be able to not only have more confidence, but also enter the workforce after high school graduation with new job skills. Hopefully, they will also develop a healthier lifestyle, including eating adequate amounts of fruits and vegetables. Armed with these essential life skills, students can attain independence and self-sufficiency in adulthood.

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## CHAPTER 1: INTRODUCTION

Determining the number of people in the United States with intellectual and/or developmental disabilities is difficult to do with total accuracy. According to the *Americans with Disabilities: 2005* report, about 16.1 million people ages 15 and older have mental and emotional disabilities that limit cognitive functioning and hinder daily activities (US Census Bureau, 2010). Today, having slower or limited cognitive functioning and development is known as an intellectual and developmental disability – IDD. To be diagnosed as an intellectual or developmental disability, the condition must be present before age 18 and is characterized by “significant limitations in both intellectual functioning and in adaptive behavior” (American Association on Intellectual and Developmental Disabilities, 2012). Due to limited ability for self-care, many individuals with IDD live in group homes or institutions and are under the care of professionals, and independence for many of them may not be an option. Recently, however, more and more IDD individuals are living in their own apartments or houses within a community. These communities have appropriate staff to aid with daily living, but the independent housing offers IDD individuals the chance to live on their own (Alba et al. 2008). With this new independence, however, they must learn to make appropriate choices concerning their daily living habits, including their health.

## **Problem and Solution**

*Essential Roots: Planting Seeds for a Bright Future* is a transitional service that integrates a research study and education program. The research portion of *Essential Roots* is the study of the importance of transitional services for IDD individuals graduating from secondary school and entering adulthood. *Essential Roots* particularly places an emphasis on nutritional well being and fundamental business skills explained through the educational aspect of this transitional service program. Lessons communicated aim to teach Scott Center students: 1.) Nutrition for healthy living; 2.) Communication skills; 3.) Professionalism and business interactions.

The key purpose for *Essential Roots* was to prepare students to join the working world after graduation by teaching healthy and essential daily living skills. Not only did *Essential Roots* provide extra-curricular lessons in nutrition and business, but it also assisted in establishing a garden, which Scott Center students supported with upkeep. This garden hosted several vegetables. Scott Center students nurtured the plants so that they could be sold to customers in a plant sale. Throughout the growing process, topics such as the way fruits and vegetables grow, their health benefits, and how to conduct a business transaction were discussed with IDD students once or twice a week. Ultimately, these practices and the newly learned material on healthy eating and business transactions were implemented in the real world setting when the IDD students sold their vegetable, herb, and flower products to customers. The students were able to ask customers if they needed assistance, state correct prices, give correct change, and understand the nutritional value of the vegetable or fruit being sold. Along with attaining fundamental



knowledge for independent living and self-sufficiency, *Essential Roots* aspired to give the students a boost in self-confidence and a sense of achievement.

## **CHAPTER 2: LITERATURE REVIEW**

### **Overview**

To improve understanding of healthy eating, transitional services focused on nutrition should be made available to IDD adolescents and adults. Teaching nutrition to IDD men and women can significantly impact their lives and health status. Positively influencing food choices made by IDD individuals through nutrition education can help reduce the high rates of overweight and obesity found in this demographic of the American population.

### **Nutritional status of IDD individuals**

The Academy of Nutrition and Dietetics –AND– states that persons with IDD are at an increased risk for “heart disease, obesity, osteoporosis, seizures, mental illness, and poor conditioning and fitness” (Academy of Nutrition and Dietetics, 2004). In fact, IDD individuals are at two to three times greater risk of being overweight or obese, and up to 55% of adults with IDD are documented as obese (Rimmer et al. 1995; Harris et al. 2003; Yamaki 2005; Melville et al. 2007). Energy and nutritional intake are believed to be the major factors affecting these high obesity and obesity-related disease rates (AND 2004; The World Health Organization 2000; Hines et al. 2011), so educating those with IDD and their primary caretakers to make healthy food choices must become a higher priority.

Not much literature has been published specifically about the nutritional states of intellectual and/or developmental disabilities. Although enhancing diet quality should be the basis of any programming and research when trying to positively affect the health status of people with IDD, previous research on IDD individuals' food intake was mostly based on determining obesity rates and establishing successful weight management strategies. The studies did not attempt to assess energy and nutrient intake, nor did they establish a post-intervention to aid in the life-style change.

In Italy, Bertoli et al. (2006) reviewed 37 IDD community residents' 7-day food diaries. The average age of the subjects was about 34 years old and researchers found that the mean energy intake was around 1472 kilocalories. Approximately half of their diets consisted of carbohydrates, about thirty percent of their consumption was fat, and the last twenty percent was protein (Bertoli et al. 2006; Donnelly, Goetz, Lee, Ptomey, Sullivan, 2013). Fatty acid make-up of the diet at intake was higher in monounsaturated and saturated fatty acids than in polyunsaturated fats, and refined carbohydrate intake was excessive. Also, micronutrients such as fiber, calcium, iron, potassium, and zinc were found to be deficient in the diets.

Another study, conducted in Sweden, investigated three days of dietary intakes for 32 adults with IDD. Milk products, bread, sugary foods, and meats comprised the largest portion of caloric intake, and most food items were consumed in between meals as snacks. Again, micronutrient deficiencies were found for fiber and iron, as well as, vitamin A, thiamin, riboflavin, folic acid, and selenium (Adolfson

et al. 2008). These deficiencies were significant because the body depends on these vitamins and minerals to act as cofactors in many metabolic processes.

In 2007, dietary fat and fruit and vegetable consumption in a United States group home community was studied in a research investigation of dietary patterns of 325 people with IDD. Information regarding dietary consumption was attained via food intake questionnaires. Donnelly, Goetz, Lee, Ptomey, and Sullivan (2013) reported that Draheim et al. found that living in a group home setting, 84% of men and 79.5% of women consumed a high fat diet (>30% of kcals from fat) compared to 71.4% of men and 70% of women who live with family, and 75% of men and 71.4% of women that live on their own or semi-dependently.

While the information garnered from this 2007 research investigation is helpful in understanding diets of IDD men and women, there were limitations to the research. Although the study was sizeable, the only dietary components examined were fats, fruits, and vegetables. This is problematic because a well-rounded view of dietary intake was not provided. Also, the only data was that collected from self-reported questionnaires. This could pose a problem with accuracy due to the fact that individuals with IDD might have difficulty reading, comprehending, or recalling information.

Each of these three studies were reviewed by Donnelly, Goetz, Lee, Ptomey, and Sullivan as they designed their own study which assessed 178 food records of individuals with IDD for diet quality and caloric intake. Two hundred ten food records were actually collected; however, eight records were eliminated because of the subjects' inability to accurately recall food choices, providing unreliable data.

The researchers found the mean caloric intake to be about 1930 kcals and the macronutrient content to be comprised of 49.7% carbohydrates, 32.9% fat, and 17.2% protein. The majority of fat consumed came from monounsaturated fatty acid sources, followed by saturated, then polyunsaturated fats. The Healthy Eating Index–2005, HEI-2005, a measurement tool created by the United States Department of Agriculture that assesses U.S. citizens' food choices in comparison to the federally recommended guidelines, was used to measure the quality of the diets. The maximum HEI score is 100 and measures total fruit, whole fruit, total vegetables, dark green and orange vegetables and legumes, total grains, whole grains, milk, meat and beans, oils, saturated fat, and sodium intakes. The male subjects, as a group, received a mean HEI-2005 score of  $46.5 \pm 11.2$  and the women received a mean score of  $46.8 \pm 11.7$  as compared to the mean American score of 51.9 (HEI 2001-2002; Donnelly, Goetz, Lee, Ptomey, & Sullivan, 2013). The HEI-2005 scores show that all Americans need to enhance healthy foods consumption, but those Americans with IDD should especially improve their diets.

The researchers also assessed the subject's weights. A direct correlation was found between low fruit, vegetable, and whole grains ingestion and overweight or obesity. Researchers noted that as "weight increased, consumptions of these healthy foods decreased" (Donnelly, Goetz, Lee, Ptomey, & Sullivan, 2013).

Along with low HEI scores in fruit, vegetable, and whole grains intake, participants were found to be deficient in vitamin A, vitamin D, vitamin E, potassium, and fiber. The amounts of these macronutrients were determined to be less than optimal by comparing them to the Estimated Average Requirements

established by researchers at the National Academy of Science, Food and Nutrition Board, Institute of Medicine, and National Academies.

This data supports the fact that about 55% of IDD persons are overweight or obese. The low intake of healthy foods and HEI-2005 scores indicate that the individuals have poor diet quality. As stated previously, not only was quality food consumption suboptimal, but also many micronutrient deficiencies existed. The deficiencies are explained by and result from inadequate intake of whole fruits, whole vegetables (with an emphasis on dark green and orange vegetables), and whole grains. Also, body weight of individuals increased as quality intake decreased; therefore, if adequate fruit, vegetable, and whole grain consumption is reached, there should be a decrease in overweight and obesity rates and healthier living for those with IDD. The risk of diabetes, metabolic syndrome, coronary artery disease, renal disease and other comorbidities that accompany obesity should also decrease.

To enforce the importance of healthy eating, transitional services with a focus on diet choices should be established in communities of adolescents and adults with IDD. However, there are limitations when working within this community. The cognitive function of individuals with IDD ranges greatly from mildly disabled to severely. Thus, nutrition education might not make a difference in some IDD individuals. In these cases, caretakers must be educated to help their wards improve quality of life through diet and life-style change. If the intake of fruits, vegetable, and whole grains increases in IDD individuals, obesity rates will reduce and an improved quality of life will be achieved.

## **Legislation**

Since the 1960s, several important pieces of legislation have been passed and amended to make state, local, federal, and public businesses more accessible to people with disabilities. These laws have transformed greater society's attitudes to people with disabilities making accessibility the rule rather than the exception and cover many facets of their daily lives. A deeper understanding of federal legislation that arch over this demographic of American society is important to understanding the factors that are vital to success for independent living.

The Mental Retardation Facilities Construction Act of 1963 was the first legislation to fund programs aimed at helping individuals with developmental retardation. It was followed years later in 1984 by the Developmental Disabilities Act (DD Act), which promotes community incorporation for those with developmental disabilities and provides education centers for supervisors who teach or interact with intellectually and/or developmentally disabled men and women.

Probably the most comprehensive legislation governing the lives of those living with IDD is the Americans with Disabilities Act (ADA) of 2008. This law protects disabled individuals against discrimination at the local, state, and federal level on the basis of their disability and provides protection against discrimination in employment, transportation, accommodations, commercial facilities, and telecommunication (United States Department of Justice, Civil Rights Division, 2009). ADA considers an individual "disabled" if they have any impairment - physical or mental - that inhibits or limits life activities.

Title I under ADA states that a company with 15 or more employees are required to provide the same employment opportunities to disabled employees as those opportunities provided to non-disabled workers. Documented steps must be followed in the interviewing process, and no questions about the interviewee's disability are allowed during questioning. Every qualified person must be treated equally when being considered for a job (U.S. Equal Opportunity Commission, 2013). According to Title II, individuals with disabilities must be provided opportunities to benefit from programs provided through state and local government such as public school systems, health care, public transportation, facility accessibility, voting, city/town meetings, and recreational services (United States Department of Justice, Civil Rights Division, 2009). Disabled men and women are protected by Title III's requirement of public places such as private schools, hotels, restaurants, and medical offices to provide usable facilities to all handicapped customers, students, patients, and the like (United States Department of Justice, Civil Rights Division). Title IV mandates adequate access to television and telephone services (Federal Communications Commission).

Central to the Individuals with Disabilities Rehabilitation Act (IDEA) of 2004 is the mandate that public schools must provide the least restraining classroom setting possible for students with intellectual and/or developmental disabilities (U.S. Department of Education, 2014). Under IDEA, each student receives an Individualized Education Program (IEP). The IEPs are unique to each student's educational needs and are determined by their mental or physical handicaps. A team consisting of the teacher, parents, and the child (if deemed appropriate) is



established to help carryout the Individualized Education Program, and a qualified agency monitors or supervise the special education.

The Rehabilitation Act promotes Affirmative Action with regards to persons with disabilities and forbids discrimination in federal employment practices. Section 503 states that Affirmative Action and non-discrimination practices must be implemented by federal government contractors and subcontractors with \$10,000 or more contracts (U.S. Department of Labor, 2013). Section 504 explains that no qualified individual with a disability should undergo unfair employment processes or be denied benefits of employment in any program that receives federal assistance financially or is part of the United States Postal Service or is directed by any executive agency (United States Department of Justice, Civil Rights Division, 2009). Section 508 requires that technology and electronic devices be made readily usable for individuals (employees and public citizens) with disabilities (U.S. General Services Administration, 2013).

With such comprehensive legislation protecting American citizens with disabilities, it is evident that the major factors influencing the degree of independent living of IDD men and women are their own abilities and the education and attitudes of those closest to them.

### **The Business World**

Individuals with intellectual and developmental disabilities (IDD) are extremely underrepresented in today's market place. However, this is not solely due to those individuals and their disabilities. Research suggests that IDD adults and

adolescents have goals to enter the workforce and provide for themselves, eventually to become involved citizens in the community (Nord et al. 2013). Family members also desire for their children or siblings to become independent.

Lack of information makes it extremely difficult to study this topic of IDD employment because researchers do not have tangible numbers stating how many people with IDD are presently participating in the workforce (Nord et al. 2013). Thanks to the American Community Survey's more general definition of IDD – "physical, mental, or emotional condition that presents a serious difficulty concentrating, remembering, or making decisions" (U.S. Census Bureau, 2010; Nord et al, 2013) – researchers were able to estimate that in 2011 the employment rate for people with mental disabilities was only 23.0%, and for those unemployed yet looking for employment it was 11.4% (Erickson, Lee, & von Schrader, 2012). Therefore, less than fifty percent of the mentally and developmentally handicapped population was employed or looking for work, which is a far greater percent than the national unemployment rate. This proportion of working IDD individuals is also lower than other groups with disabilities such as those with visual, audio, speech, and ambulatory deficiencies (Erickson, Lee, & von Schrader, 2012; U.S. Department of Labor, 2013).

High unemployment percentages for IDD exist for two major reasons. The first is that, due to their particular disability, or multiple disorders, some IDD adults and adolescents simply cannot function on their own in a business setting. Some disabilities are more severe than others and affect not only cognitive abilities, but also emotions and mobility. The second issue that affects employment rates for IDD

is the inability to successfully implement government and community programs designed to help mentally and physical handicapped individuals function independently. Due to the differing severity levels of disparate disabilities and a multitude of factors that affect daily living, education and vocational rehabilitation programs become complicated and fragmented, and services meant to aid IDD youths and adults suffer from low success rates. If IDD adolescents and adults learn skills necessary for achievement of independence and self-sufficiency, they will be able to integrate successfully into society.

Although only a relatively small amount of research has been conducted in this field, with the bulk of that in the 1970s and 1980s, several interventions have been successful in promoting employment for those with IDD. The instructional approaches intervention focuses on analyses of IDD employees with visual, audio, and ambulatory instructional techniques that inspire behavioral changes and establish daily training for IDD employees, which allow them to become fluent in their work tasks and actions (Nord et al. 2013). The repetitions of these techniques, sometimes presented in new teaching approaches by the mentor instill knowledge and allow for much technical practice by those with IDD and make it easier for them to learn how to work successfully work. An important concept in instructional technique interventions is that the fault of failure for IDD individuals to improve technically falls on the instructors in charge of teaching them, not the learners themselves (Nord et al. 2013).

Another intervention to enable mentally and physically handicapped people to join the work force is the self-management model (Rusch & Dattilo, 2012). Self-

management includes methods of learning and strategic reminders that allow IDD employees to continue their duties without or with minimal coaching by an instructor or supervisor. The methods that provide for this type of loose supervision are guides for counting, ways to pace oneself in order to perform actions efficiently and on time, and a mode to chronologically complete tasks based on visual cues, such as a picture schedule or a video monitor that signals when and/or what type of task needs completing.

Technology based interventions have emerged in more recent years along with tablets, smart phones, other hand-held computer devices, and hand-held motorized devices. Thanks to continuous improvements in technology, hand-held devices are showing great promise for increasing independence for IDD men and women in the work place. Tablets and smart phones support new ways to practice tasks and assignments given by employers. One form of support described by Nord, et al. (2013) was that of video recording. Instructional videos are available to access at all times, thus, providing IDD employees guidance while they attempt and complete tasks. Hand-held computers and other devices provide technology that reduces physical stress in task completion, making activities at work easier on the employees. The interventions create a calmer environment because managers, instructors, and/or supervisors can focus on their own tasks and have assurance that the IDD employees are finishing their job duties correctly.

Another strategy used to aid IDD individuals in the business world is natural support intervention, which involves person-centered career planning (PCP).

Natural support interventions started being used in the 1980s when the University

of New Hampshire pioneered the idea that disabled individuals should be incorporated into the workforce by focusing on their strengths rather than their deficits. Emphasis is placed on paying attention to cues and existing supports in the natural work environment (Claes, Van Hove, Vandeveld, van Loon, & Schalock, 2010). This is an intervention strategy designed directly for the IDD individual. Their personal strengths and abilities are paired with jobs that best utilize those skills, and coworkers or supervisors act as the primary resources for the employee. Person-centered career planning is often paired with the natural supports intervention. Not only does this combination emphasize the interests of the IDD man or woman, but it also incorporates the close circle of family and friends into the mix to ensure that independence is supported and achieved and that the employment is successful.

Customized employment, a promising technique for achieving self-sufficiency and success in the workforce, and is designed around the unique skills that the IDD individual brings to the table and tasks that they can easily perform on a day-to-day basis. Natural supports intervention facilitates the coaching method between the supervisor and employee. Because this approach takes more time out of the supervisor's workday, many companies reimburse or give higher wages to employees willing to give some of their time to other employees in need of guidance. Customized employment practices are still being developed and improved, but research thus far shows that IDD people who are mentored via customized employment practices work more hours, receive higher wages, and stay employed

for longer periods of time (Butterworth, Migliore, et al. 2012; Rogers, Lavin, Tran, Gantenbein, & Sharpe, 2008).

These interventions have been found to be effective across all ages, which is important because interventions should be started during the grade school years for optimal success (Carter et al., 2011b). Currently, several studies are being conducted on interventions solely aimed at assisting high school students gain employment after graduation. Although little research is available to exactly pinpoint the IDD post-high-school workforce, there are many emerging studies that assess strategies achieve post-school employment for IDD adolescents. Carter et al. (2011b) stated two major factors that help post-graduation young adults achieve employment: work experience in specific fields while in school and parents who set high expectations for and believe in their children. In today's ever changing world, it is vital that IDD students experience hands-on work during their high school years in order to work after graduation. The experience immediately sets them apart from the rest of the applicants, and the young adults in transition can feel confident in their work because they have previously completed the job (Carter, Austin, & Trainor, 2011a; Carter et al., 2011b; Timmons, Hall, Bose, Wolfe, & Winsor, 2011).

Other studies have demonstrated that paid work experience during high school is a specific educational intervention that improves success rates for IDD youths achieving employment after high school graduation. Thus, working in an internship, or any hands-on job setting, and receiving payment is a fundamentally important transitional service provided by educational services and adult services to help students merge into the real world and achieve independence (Certo &

Leucking, 2006). Thanks to paid employment from internships during school, “up to 70% of youth achieved integrated employment post-school” (Nord et al. 2013, p. 379). Therefore, in providing meaningful work experiences, educational systems and adult service providers allow for a fluid transition from school to employment with the possibility that an IDD youth might even secure a job position before graduating from school. The genuine experiences had during the school years, looks great on a resume, especially if the work was done on a regular basis and started early in the high school years. Employers are more confident to hire someone with an intellectual disability if they see that the individual has successfully completed the same type of work previously, thus a paid working experience should be an essential part of IDD youths’ education. It should also be expected that IDD young adults achieve employment. If teachers and family members do not believe that the intellectually and developmentally disabled can accomplish independence through job security, then they won’t because there is no support system backing them up and helping them prosper.

A living wage and attainment of self-sufficiency is the ultimate goal for intellectually and developmentally disabled young adults. In most cases, IDD employees earn wages at or near the national minimum and work around 20 hours per week. This type of earning and work schedule set the incomes of IDD individuals below the national poverty line. How can IDD adults provide for themselves and achieve economic independence below the poverty line? Due to the low-income levels, IDD adults rely on public benefit programs that help cover the expenses of medical care and other income supports. It has been shown in studies conducted

throughout the 1980s that IDD employees gain more income while working in their community instead of a sheltered workshop environment. Unfortunately, earning higher wages in community settings jeopardizes the chances of intellectually and developmentally disabled men and women of receiving assistance from publicly funded programs and makes it harder for them to obtain the basic necessities of life. There are, however, some employment incentive programs that can reduce the negative effect to public benefits programs of providing higher wages. Some of these programs are Plans for Achieving Self-Support, Impairment Related Work Expenses, Medical Buy-In, and the Ticket-to-Work Program. Through these established supports and benefits counseling programs, higher earnings and better employment can be obtained without the reduction in public provision for daily living expenses.

Future research must be pursued in order to improve the low employment rates of IDD adults and young adults. Low rates of unemployment actually make it difficult to gain information about the details of the disabled in the workforce, which is why studies must be flexible, detail oriented, and evolving to accommodate the growing and changing statistics emerging from currently ongoing research. This way research designs can carefully classify what types of disabled individuals are being considered in the statistics and what types of questions are being answered. For example, classifying whether an employee or an individual seeking work is disabled mentally, physically, or visually can accurately provide insight as to why he or she is employed or unemployed. Studies are further complicated by the fact that job obtainment by IDD individuals does not always lead to self-sufficiency. In fact, if higher wages are achieved in the work setting, a decrease in publicly provided



benefits that help them receive the basic necessities for living can occur. Most intellectually and developmentally disabled individuals receive or nearly receive the minimum wage and do not work as many hours as non IDD employees, thus, their income places them at or below the poverty line. More working hours and higher wages are vital to the attainment of self-sufficiency for those with IDD, but services must be provided to them with health care and other large expenses which are burdened to live healthy and independent lives.

The currently conducted research and future research must be highly inquisitive and persistent in answering questions such as, "What can schools do to help IDD students receive paid work after graduation?" According to Nord et al. (2013), schools and support services need to provide work experience to students while they are still in high school. Future research should dig deeper into this idea and determine what other actions of teachers, family, friends, and supports encourage post-grad employment. Another important question needing to be tackled by researchers is, "How effective are the interventions and transition services being used to aid self-sufficiency after school?" It must be determined what intervention methods are best and which ones make the IDD individuals feel important, needed, and independent. Other questions to be investigated and answered are how can IDD employees achieve more work hours and higher wages, and how social networking and support systems impact independence success rates of IDD men and women.

Individuals with mental and physical disabilities are not only capable of working, but they desire to work. Current rates of unemployment for IDD are

unacceptable and researchers must pursue the topic so that those with IDD can integrate into their communities and be self-sufficient.

### **Scott Center Student IDD Disorders**

The Scott Child Development Center in Oxford, MS began in 1972 as a developmental center for students with severe mental and physical challenges. It provides a standard classroom setting for IDD students to develop academic and functional skills, but teachers and supporters cater their lessons and education programs specifically to the students' needs in order to help them progress through life. Scott Center students have several different types of mental and physical challenges. As reported by their instructor, the following types of intellectual disabilities are represented in the classroom: 1) Educable Mental Retardation 2) Trainable Mental Retardation 3) Severe/Profound Mental Retardation 4) Multi-disabled Mental Retardation. According to the textbook *Mental Retardation: An Introduction to Intellectual Disabilities* (2006), the following terms are defined:

- *Educable Mental Retardation (EMR)*: students who have the ability to learn in an academic setting and become independent through grade school. A typical EMR score on an individual test of intelligence is approximately 55 to 70 (Beirne-Smith, Kim, Patton, 2006). In the Scott Center classroom, four students are considered EMR.
- *Trainable Mental Retardation (TMR)*: those who benefit from training and practicing functional skills; individuals will not benefit in general education. TMR scores on an

individual test of intelligence are 35 to 55 (Beirne-Smith, Kim, Patton, 2006). In the Scott Center classroom, four students are considered to have TMR.

- *Severe/Profound Mental Retardation*: Intense supervision is required of those who have severe or profound mental retardation. Parents, teachers, or other caregivers must perform many life-sustaining functions for them. IQ scores ranging from 20 to 40 help to classify whether or not an individual is severely or profoundly mentally handicapped. In the Scott Center classroom, one student is considered to have severe/profound mental retardation.
- *Multi-disabled Mental Retardation*: concurrent various conditions such as mental handicap and immobility. In the Scott Center classroom, one student is considered to have multi-disabled mental retardation.

Other, more specific, genetic disorders are also documented as being present in the Scott Center classroom. Those are Angelman Syndrome (AS), Prader-Willi Syndrome (PWS), Rubenstein-Taybi Syndrome (RTS), and Sturge-Weber Syndrome (SWS). All of these disorders are due to either a genetic mutation or depletion, and very rarely (if at all) are inherited.

- Angelman Syndrome mostly affects the body's nervous system. Characteristics of AS are: delayed development, severe speaking disabilities, intellectual disabilities, and ataxia (difficulty with movement and balance). Epilepsy and microcephaly (small head size) also are present in many cases of Angelman Syndrome. Detection of this syndrome happens in early childhood, and individual with AS are easily excitable.

They also tend to be cheerful and hyperactive, have a short attention spans and different sleep patterns, and are intrigued by water (A.D.A.M., 2013).

- Prader-Willi Syndrome is a disease that is present from birth, also known as a congenital disease. Obesity or overweightness, lacking muscle tone, slow mental ability, delayed motor skills, and little to no hormones produced by sex glands are traits that accompany PWS. Obesity is a very concerning health risk for those with Prader-Willi Syndrome because many times it leads to a diagnosis of Type II Diabetes for these people. Those with PWS also require physical, occupational, and speech therapy (A.D.A.M., 2013).
- Rubenstein-Taybi Syndrome classifies as a rare genetic disease in which broad thumbs and toes, as well as short stature and distinct facial features are noted. Also, abnormal heart beat and slow development physically and mentally are common. With Rubenstein-Taybi Syndrome, there can be varying degrees of intellectual disability (A.D.A.M., 2013).
- Sturge-Weber Syndrome has a distinct physical feature that helps define this disease: a port wine stain usually displayed on the face. Nervous system problems also are an effect of SWS. Not as much is known about this disease, but seizures, bodily weakness on one side, and learning disabilities are other traits or Sturge-Weber Syndrome. Glaucoma is often a complication of SWS. Sturge-Weber Syndrome is not life threatening and quality of life largely depends on the effectiveness of therapy and prevention implementation (A.D.A.M., 2013).

All of these diseases determine to what extent students can learn from educational and extra-curricular activities. Intellect and the ability to perform tasks vary from one disease to another. The students' diseases affect their abilities to live independently; however, for those that have EMR or TMR, daily living tasks can be learned and concepts understood, which is helpful in living independently.

Educators must aim to instill knowledge that will benefit future living in students with educable mental retardation and trainable mental retardation because people with these disabilities have the capacity to learn and retain the vital information if practiced enough.

Each year, about three million American students graduate high school (U.S. Department of Education, 2008). For most students, graduation is a time of new beginnings and interests. Many graduates immediately head off to college, while others enter straight into the work force. No matter the path, the average American student has hope – hope for love, hope for independence, and most of all, hope for success. Some graduates find that hope, others continue to actively search, but the major factor at hand is their ability to make informed decisions and determine their paths thanks to the knowledge and skills gained throughout their adolescent years.

However, there is a precious portion of young adults that graduate high school with uncertainty, confusion, and dependence on others. According to The National Center for Education Statistics (2013), about 13.1% of students have an intellectual or developmental disability (IDD). Of these 13.1%, only about 20.7% of non-institutionalized men and women found full time/full year work in 2011(American Community Survey, 2011). A large contributing factor to this

unemployment of about 80% of IDD adults is an extreme deficiency in life skills and business skills that are developed to the level of successful daily implementation. To give these individuals a chance to succeed in life after school, there is a societal duty to aid these individuals with knowledge that allows them to achieve self-sufficiency in healthy living and the economy.

In the Oxford School District, there are about 20 students, ages 16 to 20, who are intellectually and developmentally disabled. The students that are too severely disabled for the public school's inclusion classes are educated at the Scott Center for Child Development. All of the Scott Center students require extra services that help them transition from school to post-secondary living and, hopefully, employment (Dr. Austin, personal communication, 2012). One of those extra transition services to aid in the fulfillment of independence is *Essential Roots: Planting Seeds for a Bright Future*.

## CHAPTER 3: METHODOLOGY

### Overview

Overall, *Essential Roots: Planting Seeds for a Bright Future* lasted from the spring of 2013 to the spring of 2014. It was a controlled, non-randomized study ( $n=10$ ) on the effectiveness of transitional services focused on nutrition and business, and their role in aiding future autonomous living for individuals with IDD. IRB and parental consent was attained, and the lead investigator proceeded through *Essential Roots* with much caution not to interfere with school guidelines and student security. To determine whether or not the IDD students benefitted from *Essential Roots*, a pre-test and post-test regarding information taught in nutrition and business lessons in class and a teacher opinion survey were administered. Analyzing the tests and surveys allowed the lead investigator to determine how important nutrition and business based transitional services are in special education.

### Development of Essential Roots

In order to support the idea of the importance of transitional service implementation in grade schools hosting mentally and/or physically handicapped students, the lead investigator taught lessons, helped establish a learning garden, administered progress assessments, and coordinated a plant sale so that Scott Center students could practice new skills. To begin the *Essential Roots: Planting Seeds for a*

*Bright Future* program, a trial run of growing zinnias in the on-site greenhouses at the middle school was conducted in the spring of 2013. Zinnia seeds were distributed in soil filled Dixie cups placed in trays. Scott Center students assisted the lead investigator and supervisors in watering and maintaining the zinnias. This lasted about one month. Once the zinnias had sprouted out of the soil to exhibit small green stems and leaves, the students, lead investigator, and teachers hosted a plant sale in front of the Scott Center for family members and fellow classroom teachers. In this pilot plant sale, IDD students were given the opportunity to communicate with customers and count money, which are both vital to success in the working world. Because of the trial run experience, the lead investigator was confident that a larger scale program could be implemented and successful at the Scott Center.

During the 2013 – 2014 school year, the lead investigator began the *Essential Roots: Planting Seeds for a Bright Future* program. Lessons were taught about how fruits and vegetables grow, in what forms you can eat them, and their nutritional value and importance. Also, the human interactions from the zinnia sale involved communication and money counting which fostered the basis for incorporating money counting and professional communication into the lessons. All of these educational trainings served to improve the independence of the Scott Center IDD students. However, to proceed with the study of transitional services and their effect on IDD students' transitions into adulthood, a method of collecting pre *Essential Roots* student knowledge was necessary.



## **Knowledge Assessment**

To collect tangible data recording the students' growth during *Essential Roots*, the University of Mississippi Institutional Review Board and signed parental consent forms approved of a 10 question pre- and post-test including questions about nutrition, money, and communication to be administered. The majority of the questions were based on healthy eating and the ways that fruit and vegetable plants grow. Standardization and difficulty level were key components in creating the assessment. Having a standard test allowed the lead investigator to understand problem areas in the students' already present nutrition and business based intellect and work to emphasize key points when teaching to fill the knowledge gaps.

The test consisted of ten questions worth a total of 100 points. Four questions were fill-in-the-blank, and six were multiple choice. Each multiple choice or fill in the blank was worth one point. However, question number two contained five answer choices and only three were correct. For this question, each of the five options was worth 0.2 points to make up a total of one. For a student to receive a perfect score on the test, they would need to answer 10 out of 10 correctly. To identify whether or not the student needed teacher assistance, TA (teacher assistance) was written in the upper left hand corner of the student's assessment. Two types of teacher assistance were available, oral (TA-O) for reading the questions and physical (TA-P) for helping the student circle whichever answer he or she believed to be correct. Nine quizzes total were administered. Seven of the nine students required teacher assistance. Two of the seven only required oral teacher assistance. None of the students solely needed physical assistance. Five of the seven required both oral and physical assistance (TA-O/P).

To measure the outcome of whether or not *Essential Roots* improved the students' understanding of making good nutritional choices and leading business transactions, a post-test was administered. This post-test was identical to the initial pre-test. Basically, the post-test served as a progress report of student efforts throughout *Essential Roots*. Significant knowledge growth was present, deemed by a Dependent T-Test calculated using Statistical Packages for the Social Sciences version 21 (SPSS IBM, New York, U.S.A.). Also, to support improvements in nutritional knowledge and business skills other than the data collected through the pre and post assessments, the teachers' opinions on the success of *Essential Roots* were collected via a teacher opinion survey created by the lead investigator.

### **Educational Lessons**

After pre-test scores were obtained, nutrition and business education could progress. The lessons were taught at the Scott Center about once a week, and each lasted 30 to 50 minutes. Lesson descriptions are listed below.

- Lesson 1: *Eating the Rainbow*
  - The first session involved identifying the colors of the rainbow and relating those colors to healthy food items such as apples, carrots, broccoli, etc.... The lead investigator devised a list of health benefits of certain fruits, vegetables, and nuts for the students to learn. Also, the lead investigator created cut-outs of fruits, vegetables, and nuts, distributed the pictures of the food items equally among the students, and had them identify whether the food was a fruit, vegetable, or nut, the color, and the name of the

item. The color then related back to the rainbow, which had been correctly arranged and displayed through construction paper taped onto the smart board so that the IDD students had stimulating visuals to compare to the colors of fruits and vegetables. The lead investigator felt the correlation between the colorful rainbow and colorful fruits, vegetables, and nuts was a good device to use to help influence the students to eat colorful foods.

- Lesson 2: *Mostly Plants + MyPlate*
  - This lesson targeted informing the students about the ways in which plants grow, be it a root, stem, flower, fruit, leaf, or seed. Large black and white images were projected onto the classroom's smart board. The first image was that of a carrot, which the students identified as a carrot and learned that carrots grow as roots. Then a student was asked to volunteer and color in the projected image. By coloring the root orange, the leaves and stem green, and the dirt and roots shades of brown, the lead investigator was able to connect the first lesson about eating colorfully to this second lesson. The next projected image was that of an asparagus plant. Again, the students were asked to identify and color the vegetable, and the students learned that when eating asparagus, one is eating the stems of the plant. Thirdly, cabbage was projected and identified, colored green, and the investigator explained that when eating things such as cabbage, spinach, and lettuce, one is eating leaves. Broccoli was displayed, as well, and colored, and students learned how broccoli is actually the flower of the plant. The final image projected was a tomato plant. Students knew immediately what this plant was and the right colors for it. Some of the students even knew that the tomato was the fruit of the plant. From this point, the lead investigator held a session on MyPlate and how to read it. The class talked about favorite

foods and determined where on the MyPlate diagram the food item would fit. A blank plate and glass image was then passed around and the students quartered the plate and drew in each section whether fruits, vegetables, meats, grains, or dairy belonged. A point was made to incorporate the previously discussed produce into their MyPlate sketches.

- Lesson 3: *Grocery Shopping*
  - Food models and construction paper money were used in this lesson to help convey the importance of customer interaction and money exchange. Arrangements of the food models were displayed along the counter in the classroom and each food item/food group had a price tag. The lead investigator designated one student to be the clerk and three students to be customers. The customers were given different amounts of play money in the form of one dollar bills, five dollar bills, 10 dollar bills, and 20 dollar bills. Student customers approached the clerk with the items they wished to purchase and a dialogue followed. When “checking out,” the clerk was instructed to say something along the lines of “How may I help you today?” and the customer said something similar to “I would like to buy these items.” Proceeding with the dialogue, the clerk counted up the dollar amount owed, communicated that amount to the customer, and made correct change based on the money given to the clerk. Closing dialogue consisted of the clerk handing the customer correct change with “Thank you. Have a nice day.” or “Thank you for shopping with us.” After “grocery shopping” with different students volunteering for the various roles, the classroom’s teacher brought over their example money sets and the lead investigator and students practiced making change and identifying coins and dollars. Students appeared to thoroughly enjoy this lesson and completed the tasks of communicating in a business setting and counting money exceptionally. Not all IDD

students were capable of participating in this lesson due to their degree of IDD. However, those who are educable mentally retarded and trainable mentally retarded appeared to participate in and learn from this session successfully.

- Lesson 4: *Herbs and Flowers*
  - This lesson was short and consisted of planting dill, basil, oregano, thyme, parsley, and flowers in an indoor, makeshift greenhouse. While planting, students and the investigator held light, conversational dialogue about how people use herbs and how to take care of the indoor plants. Also, the students were informed that they would be selling the herbs and flowers at the Scott Center Plant Sale where the communication and money counting skills learned and practiced in lesson three would be applied.
- Lesson 5: *Outdoor Garden*
  - Many, many dedicated hours were spent preparing a 10 X 10 plot of land in a grassy area on the south side the Scott Center so that students could learn how to plant and take care of an outdoor garden. The lead investigator and a volunteer used power tools to till the earth and make rows in the plot. Once the plot was ready for planting, the fifth lesson occurred and students were taught how to dig holes large and deep enough for the vegetable seedling being transplanted, then students sprinkled mineral rich fertilizer into the hole, placed the plant into it, covered the plant with dirt up to the stem, and then watered them. The vegetables being transplanted were cauliflower, spinach, cabbage, and broccoli. While planting, the lead investigator led discussions about which part of the vegetable one actually eats when maximum plant growth is achieved. For example, the students learned that the edible portion of broccoli is actually the flower of the plant, and when eating spinach, one is eating leaves. Once all plants were transplanted, the students

watered them with the “1, 2, 3” technique. The “1, 2, 3” technique was an easy tool created by the lead investigator to instruct the IDD students about how much water was needed for the plant. All IDD students with functioning motor skills walked along the rows with watering buckets. Each time a plant was reached, the student poured water on it verbally counting “1... 2... 3” and then moved onto the next vegetable conducting the same task. Throughout the week, the IDD students and their supervisors were in charge of watering the garden, and the lead investigator came once a week to conduct other lessons and check on the garden. *Outdoor Garden* aimed to instruct students on how to set up a garden, plant produce, keep the plants watered for continued growth, and attain skills that could be implemented to achieve a more autonomous adulthood through self-care and employment.

- Lesson 6: *Not Too Much*
  - *Not Too Much* was an educational lesson about eating food with high sugar and/or fat content in moderation. The lead investigator demonstrated how much sugar was contained in a two liter bottled soda, 20 ounce bottled soda, and a 12 ounce can of soda. The high sugar content was explained by physically measuring out tablespoons of sugar and using a funnel to pour the sugar into the bottles or cans. Students had to count aloud while the tablespoons of sugar were being measured out. To save time, the large two liter soda bottle sugar content was pre-measured into a measuring cup and the IDD students observed how much of the bottle was filled by the sugar when a student volunteer poured the sugar into the two liter.

In this lesson, fat content was also demonstrated using shortening. A spoon of shortening was passed around, and IDD students were instructed to touch it and rub it

between their fingers to feel the oiliness and greasiness of the cooking fat. After each student had the opportunity to touch the shortening, the class measured out – in tablespoons – the amount of fat in a peanut butter chocolate candy. Fruits and vegetable were emphasized as being some of the best food choices in one’s diet because they are low in sugar and fat when compared to sodas and other junk foods. The ultimate goal of this lesson was to demonstrate how much sugar and fat content consumes the junk food Americans love to eat, and that those foods are acceptable to eat sometimes, but in moderation.

Not only were lessons taught to the IDD students on the Scott Center campus, but also a plant sale was conducted outside of the University of Mississippi Student Union on the morning of April 11<sup>th</sup>, 2014. The plants sold were the indoor herbs and flowers, and the outdoor garden’s spinach, cabbage, broccoli, and cauliflower. The key purpose to hosting this plant sale with the IDD students was for them to experience and participate in the business world first hand. Classroom lessons (i.e. – *Grocery Shopping*) and all of the times students and the lead investigator spent with the outdoor garden prepared students for conversing with real customers at the plant sale. Hosting the plant sale was a successful method that allowed the IDD students to incorporate what they had learned in *Essential Roots* into the real world. At the conclusion of the sale, students verbalized being proud that they had conducted professional interactions successfully.

## CHAPTER 4: RESULTS

To measure *Essential Roots*' effectiveness in the classroom, a pre- and post-test was given. These tests assessed the amount of information known before educational lessons and discussions were held and the amount of information that was learned and retained after teaching. Consistency was maintained in the evaluation process by administering identical pre- and post-tests. Statistical Packages for the Social Sciences version 21 (SPSS IBM, New York, U.S.A.) calculated the presence of statistical significance by comparing improvements in test scores. To gain information on the effectiveness of the pilot transitional program from the teachers' points of view, a teacher opinion survey was delivered. Both of these methods helped define the necessity and usefulness of nutrition and business transitional programs in grade schools.

### **Pre- and Post-Test Results**

The test consisted of ten questions worth a total of 10 points. Four questions were fill-in-the-blank and six were multiple choice. To identify if the student utilized teacher assistance, TA (teacher assistance) was written in the upper left hand corner of the student's test. Two types of teacher assistance were available, oral (TA-O) for reading the questions and physical (TA-P) for helping the student circle whichever answer he or she believed to be correct. Some students required both physical and oral assistance (TA – O/P) due to incapacitating IDD conditions.



Nine pre-tests were administered to Scott Center IDD students. Seven of the nine students required teacher assistance. Two of the seven students in need of teacher assistance required TA-O only. None of the students needed TA-P alone. Five of the seven required TA-O/P.

The average quiz score for the two quizzes completed independently (No-TA) was a high score of 9.3. The TA-O score mean was 7.8. The TA-O/P average score was 8.0. Combined as a class, the mean score for the pre-test was 8.2 points correct. These pre-test scores show that the students already had an understanding of nutrition and professional communication. However, a limiting factor must be recognized: students requiring TA-O/P did not fully complete the test without influences towards the correct answers. Thus, it is important to note that the truest scores are from those individuals who completed the test with No TA, followed by the student receiving only TA-O.

After educational lessons on business skills and healthy eating were completed, the post assessment was given to IDD students. The post-test matched the pre-test and was graded the same way: each question equaled one point and there were ten questions. Thus, a perfect score was a 10 out 10 correctly answered questions. The method used in administration of the post-test was also the same as the method of the pre-test. IDD students who completed the test without teacher assistance have scores designated No TA; those who required oral assistance are noted as TA-O; IDD students in need of both physical and oral assistance due to severe disabilities were scored with the label of TA-O/P.

Each IDD student improved his or her test scores from the pre to post assessments. In fact, every test the lead investigator received from the teachers assisting

students and from the students who completed the post-test independently all scored 10 out of 10 correctly. Perfect scores from all the students lead to suspicion on exactly how much teacher assistance they received. All of the students requiring TA-O/P have high degrees of intellectual and developmental disabilities (for example, Rubenstein-Taybi Syndrome or Sturge-Weber Syndrome) and could not complete the tests without help and influencing from supervisors towards the accurate answers. Teacher assistance is the factor that enabled this demographic of the Scott Center students to successfully complete the post-test with a perfect score of 10.

On the contrary, those accomplishing the post-test with No TA and TA-O did actually improve from the pre-test because they scored a perfect 10 on their own accord. The four independent students analyzed the test questions and answered correctly based on the information learned and discussed through the *Essential Roots* classroom activities. These students show that not only do they understand ways to make healthy choices and communicate in the business world, but also that they can retain the information over an extended period of time (several months in the case of *Essential Roots*).

Using SPSS 21, a Dependent T-Test was processed to determine if pre- and post-test scores significantly improved. According to SPSS 21, all of the post-test scores significantly increased ( $P \leq 0.005$ ) from the initial pre-tests. Finding significance in the pre-test versus the post-test scores is important because the data supports that the students understand healthy nutrition choices and how to communicate well with others. Comprehending both of these aspects of *Essential Roots* will help the students live prosperously after their time in school because good nutrition is pertinent for vitality and

practiced business skills are necessary for economic stability. Progress such as this demonstrated through *Essential Roots* exemplifies why transitional services with a focus on nutrition and business should be implemented in grade schools for children with intellectual and developmental disabilities.

### Pre-test Scores

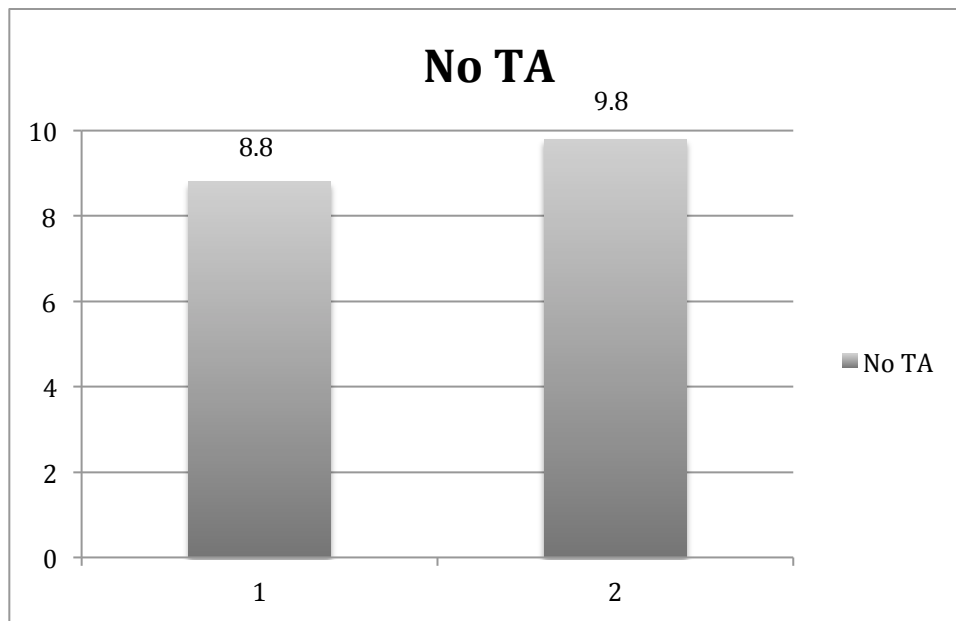


Table 1. The two students' scores from the pre-test with no teacher assistance.

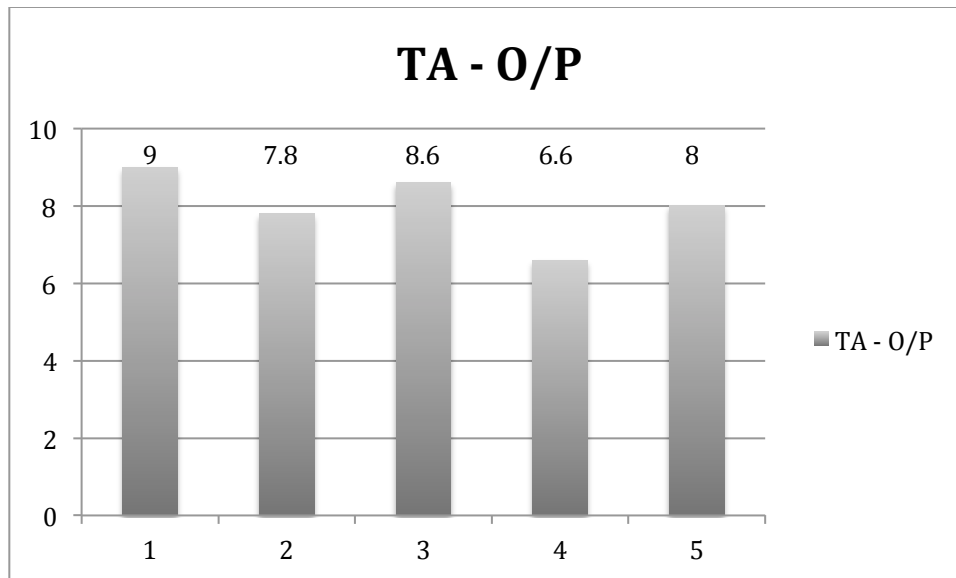


Table 2. Pre-test scores for students who required a teacher's oral and physical assistance.

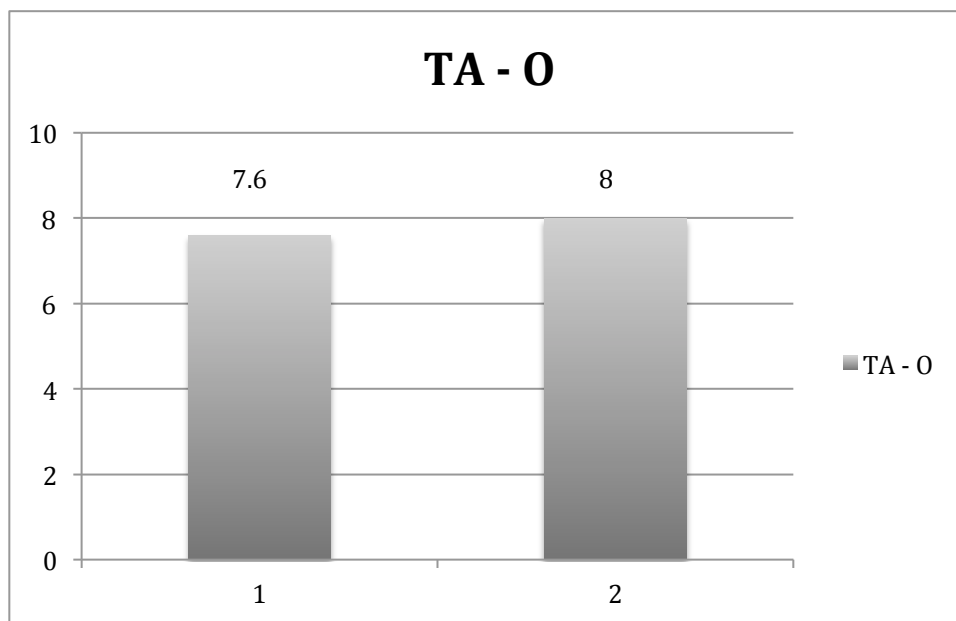


Table 3. Pre-test scores of two students who completed the pre-test with teacher assistance in reading the questions.

### Pre-tests compared to Post-tests

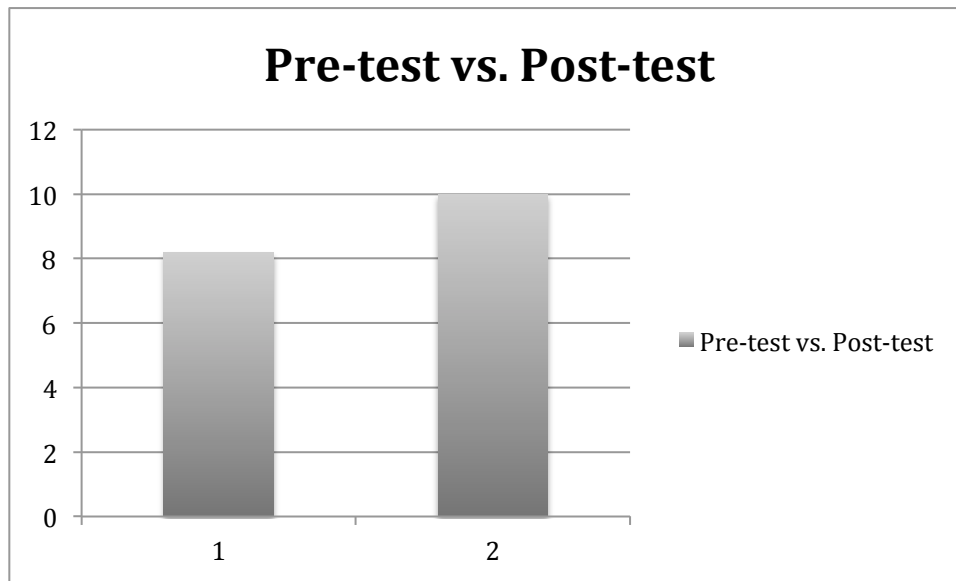


Table 4. Class average pre-test scores compared to class average post-test scores.

### Teacher Opinion Survey Results

To gather data on the views of the two Scott Center teachers that allowed *Essential Roots* to be incorporated into their classroom, the lead investigator created a questionnaire inspecting the effectiveness of *Essential Roots*. Ten statements were listed with blank spaces to the side needing to be filled by a number from a given scale. The scale ranged from 1, “Strongly Agree,” to 5, “Strongly Disagree.” Filling in the gaps of 2, 3, and 4 were “Agree,” “Neither,” and “Disagree.” The bottom of the survey was designated for teacher comments. Both teachers “Strongly Agreed” that *Essential Roots* was effective and thorough, useful, enjoyable for the students, applicable to daily living,

and important. The lowest score given was a 2, “Agree,” and it was given on the basis that not all of the students could use skills taught by *Essential Roots* with total self-sufficiency and not all students could recall all of the information given in the lessons (both negatives are due to severe mental and/or physical disabilities).

From the comments section on the primary teacher’s survey was written, “The lessons focused on daily living, nutrition, and independent living, plus functional math. The lessons were presented in a total communication approach, which naturally allowed for differentiation of instruction. [The lead investigator] challenged the students to reach their own maximum potential for learning... It was thorough, but fun.” The assistant teacher noted in the comments section, “The variety of activities, interaction, hands-on [experience], and positive teacher reinforcement was fantastic!” Based on the teachers’ viewpoints of *Essential Roots*, one can determine that the program was effective, fun, and necessary for supporting the students in circumstances where being able to function or live independently is necessary for quality of life and prosperity.

## CHAPTER 5: DISCUSSION

It is clear that transitional services are vital to the well being of individuals with IDD. These services aim to integrate those with IDD into the community and make them active citizens. Many universities such as Clemson University and the University of South Carolina are now hosting programs that teach independent living habits to college age men and women. The IDD students learn everything from cooking to laundry and do so in apartment style housing supervised by resident assistants. Through the promotion of independent living, transitional services such as Clemson University's ClemsonLIFE, young adults with IDD are able to have collegiate experiences and practice basic activities to help them live autonomously.

Although autonomous living and economic independence is promoted through these collegiate transitional services, programs must be implemented in grade schools as well to ingrain in IDD students the fundamentals of taking care of oneself. By starting programs while students are young, transitional services reach students at a time in their lives when their brains and bodies are still developing. Daily implementation of such programs can really make a difference in the lives of adolescents in grade school because they will be practicing skills repetitively over a longer period of time. The repetition of activities or educational lessons that focus on independent living skills can make a difference in the lives of students who are educable mentally retarded or trainable mentally retarded. Even those with more severe intellectual or developmental disabilities can benefit from the implementation of transitional services in grade school thanks to the extended period of exposure to the information.

Developing services that promote independence in adolescents and adults with IDD are becoming more and more popular, and education systems and institutions are realizing the importance of these programs. However, the lack of literature leads to the belief that few transitional services primarily focus on eating habits and nutritional choices of IDD individuals, especially those in grade school. It is vital that programs for IDD men, women, and children emphasize diet because so many of these individuals have complications that lead to overweight and obesity. By law, IDD students must be served adequate meals in school lunchrooms that meet the specific needs of each IDD student (i.e., mechanically soft foods for those who have difficulty chewing). However, this lawful provision does not extend information to the students regarding how to make healthy or appropriate food choices on their own. If nutrition knowledge could be provided to students through transitional services on how and why to eat healthy foods, then overweight or obesity rates could be reduced.

In the small amount of literature published on the topic of IDD student nutrition, it was found that not only are many IDD adolescents and adults overweight, but many have micronutrient malnourishments for fiber, iron, vitamin A, thiamin, riboflavin, folic acid, and selenium (Adolfson et al. 2008). Through nutrition transitional services, IDD individuals can live longer and healthier on their own because they will be prepared to choose healthy foods over junk foods. An impact can be made on and autonomous living can be promoted in the lives of IDD men and women if transitional services are provided for them at young ages that explain the vitality of nutritious eating.

Other beneficial skills that should be taught through transitional services are business transactions and communication. Being armed with the ability to conduct



business and communicate effectively with customers encourages for future employment, and thus, economic stability. The Americans with Disabilities Act protects IDD adults from discrimination in the interview process and the workplace. Even with this governmental security, unemployment rates are high in the American demographic of IDD men and women because they have not had the business experiences to qualify them for job positions. Transitional services that focus on business skills (i.e., counting money or making change) and communication skills such as asking, “How may I help you?” can assist IDD individuals in attaining basic level jobs and, more importantly, an income. Experiences provided via business and communication transitional services allow for economic stability, which leads to independent living.

*Essential Roots: Planting Seeds for a Bright Future* served as a pilot transitional services program in the Oxford School District’s Scott Child Development Center. This program was unique because it combined nutrition education with business and communication skills. Through *Essential Roots*, Scott Center IDD students were given the chance to learn nutrition education in tandem with fundamental business and communication skills. The establishment of a garden outside the Scott Center and maintenance of herbs and flowers grown inside the classroom were ways for the lead investigator to make classroom nutrition lessons on vegetables and fruits come to life. Also, students to learned how to cultivate their own produce through the day-to-day care of the garden and indoor plants, all while observing the plants’ growing process. As an aside, the students learned how to hook up a water hose, set up a periphery fence around the outdoor garden, and maintain the garden. All of these activities may seem elementary to the average American, but for someone with IDD, these are experiences that teach

basic life skills and could possibly lead to employment (i.e. – landscaping, employment at a co-op, etc.).

The combination of nutrition and business was brought full circle at the Scott Center Plant Sale. The plant sale allowed students to practice their business and communication skills while selling the plants they were able to see come to fruition in their garden at the Scott Center and inside the classroom. This was the most vital aspect of *Essential Roots* because students applied their new information to interactions with actual customers in a real business setting. They were armed with background knowledge of how nutritious and healthy the vegetables they grew were for consumption, and at the plant sale they were able to pass those healthy vegetables on to strangers via business transactions.

At the sale the students asked, “How may I help you?” to initiate the conversation, followed by an explanation of what produce was available. To finalize the sale, the money amount due for purchasing the plants was stated by the Scott Center students, and if change needed to be returned, math calculations were conducted and correct change given. Not only were the students successful in using their business and communication skillset united with nutrition, but they had fun selling the plants and communicating with college students and faculty who attended the sale. Even more importantly, smiles spread across the students’ faces as they felt a sense of achievement after all the plants had been sold. From learning about the nutritious aspects of vegetables and fruits, to planting seedlings of cabbage, broccoli, spinach, and cauliflower, and finally selling their produce, the Scott Center students were proud of themselves and their hard work that had been completed throughout the year.

To statistically measure the knowledge growth of the IDD students on the basis of nutrition, business, and communication, pre- and post-tests were given. A Dependent T-Test was run using SPSS 21 and proved that *Essential Roots* was conducted successfully because the student's test scores significantly improved ( $P \leq 0.005$ ) from the start of the program to the finish. The significant increase in test scores supports the fact that transitional services should be implemented in grade school and, in particular, focus on lifestyle eating habits and business experiences so that future independent living and economic sustainability can be achieved.

### **Limitations**

Although *Essential Roots* was a great experience for students, teachers, and the lead investigator, this pilot transitional service program did pose some limitations. The classroom participating in *Essential Roots* consisted of only 10 students, and many days, not all 10 were present. With such a small intervention sample size, it is difficult to know whether or not the same type of significant benefits could be achieved in a larger sample size. To test this, future researchers should aim to implement programs such as *Essential Roots* in several school districts at the local, state, and/or national level. Having a larger sample size would more strongly support the data found and give researchers the ability to make a general statement on the overall effectiveness of nutrition and business transitional services at the grade school level. Another limitation hindering the data found in *Essential Roots* was the range of disabilities of IDD students in the Scott Center classroom. The students ranged from educable and trainable mentally retarded to severely/profoundly mentally retarded and multi-disabled. The degrees of disability

determined how well the students learned, retained, and practiced the material provided to them by *Essential Roots*. Future investigators should strive to implement transitional service interventions specific to each type of disability.

It is important that this topic continue to be addressed because many questions are left unanswered. Due to the small scope of research capabilities available to *Essential Roots*, following the students into adulthood to see if the education and application of nutrition, business, and communication skills actually facilitate independent living is impossible. Such restrictions leave the lead investigator only to project – based on the fact that non-disabled individuals use such knowledge to prosper daily – that teaching healthy eating and professionalism will promote independent living and economic stability. With appropriate funding and resources, longitudinal studies should be conducted to verify the effectiveness of nutrition and business transitional programs at the grade school level. By conducting a longitudinal research study, verification of the lead investigator’s predictions on independent living and job attainment can be realized, generalized, and hopefully utilized across the nation to help IDD students transition into adulthood.

## CHAPTER 6: CONCLUSION

Although *Essential Roots: Planting Seeds for a Bright Future* was a small scale pilot transitional service providing nutrition and business education, it impacted the lives of 10 IDD students in a positive way. Students learned about eating colorfully, MyPlate, how plants grow, the skills, time, and patience it takes to maintain a garden, how to make change, and how to communicate well. The students felt a sense of achievement after the successful plant sale, and knowledge growth was significant in pre- and post-test performance. The teachers of the Scott Center classroom involved in *Essential Roots* expressed through the teacher opinion surveys that the students enjoyed the program, the lessons were valuable to the IDD adolescents' life prosperity, and that transitional services such as *Essential Roots* are necessary for improving IDD quality of life. Ultimately, Scott Center IDD students gained knowledge about nutritional well being, effective communication, and professionalism through all of the extra-curricular practices of *Essential Roots*. Most importantly, the students received a boost in self-confidence and pride from all aspects of the transitional service. Repeated practice of the learned skills and information, along with continued implementation of similar transitional services should prove beneficial to those who participated in the program. All of the experiences of *Essential Roots* lay the groundwork for independent lifestyles and economic self-sufficiency through employment for the students of the Scott Child Development Center.

**APPENDICES**

## APPENDIX A

### Consent to Participate in Sally McDonnell Barksdale Honors College Thesis Research Title: Essential Roots: Planting Seeds for a Bright Future

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662-915-5172

Description:

At the University of Mississippi, I am a senior Nutrition major and am also part of the Sally McDonnell Barksdale Honors College. In order to graduate, each potential grad must write a thesis and conduct research applicable to their field of study. For my thesis, I am working on planting vegetables in the greenhouses between Oxford Middle School and the Scott Center. Once or twice a month, I plan on teaching a short lesson to Scott Center students on gardening and the nutritional value of vegetables being cultivated. During this time, I will be seeking the assistance from the students in the plant's growth process and will supervise one day a week the watering of the plants. Sometime mid spring, we will sell the produce at the community farmers market. My ultimate goal for the Essential Roots program is to not only teach the intellectually and/or developmentally disabled students about nutrition, but also, through gardening and selling, to give them basic skills, such as interpersonal communication and counting money, that will support life after high school graduation. Most importantly, these students will be able to witness the growth of life and will have a sense of accomplishment.

Confidentiality:

No child's name will be released to the public or included in the final thesis document.

Statement of Consent:

I have read the above information. I have been given a copy of this form. I have had an opportunity to ask questions and have received answers. I consent my permission for my child to participate in this thesis project.

Signature of Parent/Guardian

Date

Signature of Teacher

Date

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Signature of Investigator

Date

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## APPENDIX B

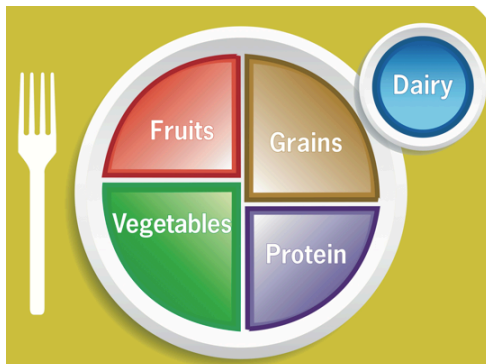
1. Based on color and health benefits, which group of food is better to eat?



2. Fruits and vegetables can grow in many forms. Circle all of the ways in which they can grow:

Roots      Thorns      Leaves      Fruits      Branches

3. Which plate picture shows the correct way to fill your plate at lunch or dinner?



4. Is it better to eat a lot of fruits and vegetables or a lot of meat?



(Circle the answer)

Fruits and Vegetables

Meats

Fill in the blank with a word from the word list:

Seed

Water

Roots

Vitamins

Strong

Money

5. To grow a plant, you put a \_\_\_\_\_ in the dirt and give it \_\_\_\_\_ 3 or 4 times a week to help it grow strong.
6. Plants get water through their \_\_\_\_\_ in the ground.
7. Eating colorful, healthy foods gives you \_\_\_\_\_ and keeps your body \_\_\_\_\_.
8. When you buy something, you pay for it with \_\_\_\_\_.

Choose the correct letter.

9. What do you do if someone pays you too much money?
  - a.) Give them correct change
  - b.) Keep the extra money
  - c.) Give them all of the money back
10. When talking to a customer, you:
  - a.) Look down at the ground
  - b.) Smile and make eye contact
  - c.) Stare at them

## APPENDIX C

Teacher: \_\_\_\_\_  
Date: \_\_\_\_\_

Give each statement a rating based on your opinion of *Essential Roots: Planting Seeds for a Bright Future*.

Strongly Agree = 1      Agree = 2      Neither = 3      Disagree = 4      Strongly Disagree = 5

- Students enjoyed lessons and activities. \_\_\_\_
- Essential Roots taught students about nutrition and business. \_\_\_\_
- The teaching style was effective and thorough. \_\_\_\_
- Students can independently use the skills taught to them during Essential Roots. \_\_\_\_
- During lessons, knowledge improvements were noted during interactions between the instructor and students. \_\_\_\_
- Students have retained the knowledge taught to them. \_\_\_\_
- Students looked forward to using skills and knowledge from Essential Roots. \_\_\_\_
- Growing and selling plants was a good way for students to learn business communication skills.  
\_\_\_\_
- Programs like Essential Roots are important for student's lives after school. \_\_\_\_
- Overall, students have a sense of accomplishment and deepened knowledge after participating in Essential Roots. \_\_\_\_
- Comments:

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