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Research Article

Academic or Functional Life Skills? Using Behaviors Associated with Happiness to Guide Instruction for Students with Profound/Multiple Disabilities

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The field of special education has begun to concentrate its efforts on developing objectives and procedural strategies that promote a positive quality of life for students with profound multiple disabilities, while determining which educational strategies are the most appropriate. A multielement design was used to compare the effects of two educational conditions, academic skills instruction and functional life skills instruction, on the quality of life indicators of four students with profound multiple disabilities. Results indicated that all four students demonstrated a greater number of behaviors associated with happiness while receiving academic skills instruction. Implications for current educational practices are addressed and directions for future research are discussed.

1. Introduction

Historically, a relatively limited amount of research in the field of special education has focused upon both the academic and functional needs of students with profound multiple disabilities (PMD). Students with PMD are those considered to be the most significantly impaired. In public schools in the United States, this small population of students encompasses children between the ages of three and twenty-one diagnosed with a combination of disabilities including, but not limited to profound cognitive impairment, severe physical disabilities, substantial sensory difficulties, and/or chronic medical conditions [1–3]. These students require pervasive levels of support while in school as their level of overall development peaked at approximately two years of age in all core areas of functioning (e.g., communication, social skills, mobility, and self-help skills) [3]. Consequently, instruction for this population was based solely on a functional life skills curriculum which focused upon teaching important knowledge and skills that assisted the student to be more independent in the home and community. Despite the success of teaching the functional life skills curriculum [4], there was no regard for academic success with this population of learners. Previously, teachers had minimal expectations regarding academic achievement of students with PMD [5] and special educators often struggled with determining appropriate methods to encourage active participation during academic tasks. Additionally, quality of life concepts, such as happiness and self-determination, were often disregarded when considering educational focus [6–8].

However, following the passage of recent legislation in the United States, the curricular focus for students with PMD is changing. The Individuals with Disabilities Education Act (IDEA) Amendments of 2004 [9] required that each state create an additive educational framework that provided all students, including those with PMD, the opportunity to access, to participate, and to progress in the general education curriculum in addition to receiving instruction in a functional life skills curriculum. In addition, the No Child Left Behind (NCLB) Act of 2001 [10] mandated that states assess this population of learners on academic standards drawn from the general education curriculum in the content areas of reading, math, and science.

Notwithstanding recent legislation in the United States, many special educators [5] do not believe that it is appropriate for students with PMD to participate in the general

education curriculum; therefore, little effort has been made to advance access to this curriculum. Agran and colleagues [5] indicated that one of the primary reasons stated by special educators as to why access to the general education curriculum was inappropriate was the inability to determine the potential gains of this instruction to students with PMD. Consequently, the lack of functional assessment of the utility of student exposure to the general curriculum may be negatively influencing educators' expectations. In their literature review, Nietupski et al. [11] indicated the need to identify appropriate curricular content which has been a central concern in the field of special education in the United States since its inception. Nietupski and associates [11] described the elemental curricular shift for students with PMD from the developmental model, which was based on the assumption that the educational needs of students with PMD would be best served by focusing on his or her mental age, to the functional model which focused on teaching a variety of chronologically age appropriate skills deemed necessary to function successfully in domestic, community, and vocational environments [5, 12, 13]. Currently in the United States, the curricular focus for children with PMD is shifting again [14], moving from a strictly functional life skills approach toward one that emphasizes access to both the functional life skills curriculum and the academic content from the general education curriculum.

Previous research in the field of PMD has focused upon the success and benefits of teaching a functional life skills curriculum. For example, Stone-MacDonald [15] indicated a school in Tanzania saw improvement for children with intellectual impairments in skills such as cooking and sewing through the use of interventions and strategies like modeling, direct instruction, and practice during the instructional day. Additionally, Alwell and Cobb [4] reported from their review of 50 studies targeting functional or life skills interventions that these curricular interventions are successful in promoting positive transition outcomes for students with moderate to severe intellectual disabilities. Although special educators have achieved positive outcomes through the teaching of functional life skills in isolation to students with PMD, they grapple with the additive process of incorporating general academic curriculum into a functional life skills curriculum. Particularly, special educators continue to struggle to generate and apply effective educational strategies to teach academics to students with PMD. However, with the heightened emphasis on increasing access for students with PMD to the general education curriculum, the notion of teaching these students academic skills (e.g., preliteracy and prenumeracy) has received increased attention [16–19]. Reasons for this attention include improving adult competence, increasing educator's expectations, and providing comprehensive instruction [20–22].

Regrettably, there have been relatively few research studies conducted in the area of academic benefit for students with PMD. Historically, studies have addressed access to general education [14, 17, 20, 23], developing self-determination [24–26], improving communication [27], improving functional life skills [4, 15], and enhancing independent functioning [12]. Another intriguing area of recent study focusing upon this unique population of individuals has emerged. This research has concentrated upon the concept of quality of life and its influence on the work and leisure activities of adults with PMD [28–33].

The multifaceted term quality of life refers to the aspects of one's well-being (e.g., physical function, social interaction, and cognitive functioning). In addition, aspects associated with one's environment and relevant life areas contribute to overall quality of life [34–36]. Many researchers [37–39] argue that although several quality of life principles (e.g., health, happiness, contribution to society, and wealth) are relevant and applicable for the majority of individuals, these principles should be translated into more concise indicators that reflect the unique needs of individuals with PMD. Particularly, various researchers [30, 31, 38] suggest that emphasis on quality of life for these individuals should focus explicitly on measuring two key components, happiness and self-determination.

The definition of happiness established by Green and Reid [40, 41] is the most recognized definition in the field of PMD [30, 35, 42]. Based on empirical research attempting to operationally define happiness indices among individuals with PMD engaging in preferred activities, Green and Reid [40, 41] suggest that happiness is characterized as "any facial expression or vocalization typically considered to be an indicator of happiness among people without disabilities (e.g., smiling, laughing and yelling while smiling)" (page 69). Additionally, researchers [36, 43, 44] note that specific behaviors such as clapping, hand rubbing, hopping in wheelchair, arm waving, singing, dancing, and head twirling should be considered behaviors indicating feelings of happiness among people with PMD during preferred activities. For individuals who demonstrate extremely low levels of functioning, less conventional behaviors that demonstrate feelings of happiness have been suggested. These behaviors include a change in muscle tone, increased opening of eyes, a change in arousal level, or change in physiologic measures such as heart rate [45]. Due to the multifaceted definition of happiness, in addition to the multiple components that constitute happiness (e.g., personal well-being, pleasure, and satisfaction), researchers continue to utilize this concept to describe a positive quality of life for individuals with PMD [34, 43].

Presently, a small number of practitioners have begun to concentrate efforts on identifying and planning for adequate quality of life opportunities for individuals with PMD, while determining which vocational and educational strategies are most appropriate for fostering the long term success of these individuals [29, 32, 33, 42, 43]. Overall, there has been a fundamental shift in thinking among many professionals in the field of PMD so that researchers are now focusing attention on the capabilities of people with disabilities rather than their deficits [14, 29]. Therefore, quality of life measures for individuals with PMD have become an important factor to consider when educating this population. Focusing on and enhancing the strengths and capabilities of these individuals may afford them greater opportunities for meaningful participation, community inclusion, and positive educational outcomes [6, 20].

Table 1: Characteristics of students.

Student	Age	Ethnicity	Disability label	Developmental level Battelle Developmental Inventory [46]	Verbal	Medical diagnosis
1	16	Caucasian	Profound multiple disabilities	1 year, 8 months	No	Anoxic encephalopathy, visually impaired, spastic quadriplegic cerebral palsy, scoliosis, seizure disorder, and gastrostomy
2	13	African-American	Profound multiple disabilities	1 year, 1 month	No	Anoxic brain injury, visually impaired, cerebral palsy, scoliosis, seizure disorder, tracheal malacia, and gastrostomy
3	20	Caucasian	Profound multiple disabilities	1 year, 4 months	No	Cerebral palsy, visual impairment, hearing impairment, scoliosis, seizure disorder, and gastrostomy
4	20	African-American	Profound multiple disabilities	1 year, 6 months	No	Hypoxic ischemic encephalopathy, visually impaired, spastic cerebral palsy, scoliosis, seizure disorder, and gastrostomy

1.1. Aim of This Study. As students with PMD in the United States are expected to attain higher levels of academic achievement through access and participation in the general education curriculum, it becomes necessary to also document the impact academic instruction has on the student's overall quality of life. For this reason, the present study attempted to evaluate the existence of a link between teaching academic content and a display of behaviors traditionally associated with the demonstration of a positive quality of life for students with PMD. Particularly, the following research question was investigated: What is the influence of teaching academics on the quality of life of adolescent students with profound multiple disabilities as measured by behaviors associated with student happiness?

2. Method

2.1. Participants. Four students were purposefully selected to participate in the study based on the following selection criteria: (a) an intelligence quotient that was considered unable to be calculated via traditional I.Q. assessments, therefore the student being subsequently given the educational label of severe/profound intellectual disability (SPD) by the school program, (b) overall functioning of developmental age below 2 years as indicated by results obtained from the Battelle Developmental Inventory [46], (c) being nonverbal, but able to engage in functional communication via nontraditional methods, (d) receiving all nourishment via gastrostomy tube, and (e) having consistent school attendance (e.g., absent less than two times per month) prior to the onset of the study. All of the students selected were female, ranged in age from 13 to 21 years, and received their education in a regional public day school. In addition, all students were nonverbal, nonambulatory, visually impaired, and diagnosed with a seizure disorder. Demographic information for the four student participants is shown in Table 1.

2.2. Setting. The investigation occurred in a regional public day school housed within an intermediate care facility in metropolitan southeastern Virginia. Each student received educational services in a self-contained classroom. For this study, two self-contained classrooms were utilized. Students 1 and 2 were members of the first classroom and Students 3 and 4 were members of the second classroom. Students remained in the self-contained classroom for the entire school day, moving between activities established in the classroom throughout the day. The educational staff in each classroom consisted of one special education teacher and two paraprofessionals. The research study was conducted during a five-week summer school program that met Monday through Thursday, from 9 am until 1 pm. Summer school instruction focused on a combination of functional life skill goals derived from each student's individualized education plan (IEP) and academic skill goals outlined by the Virginia Aligned Standards of Learning (ASOL) which are derived directly from Virginia's public school general curriculum guidelines [47].

2.3. Dependent Variables and Data Collection Procedures

2.3.1. Dependent Variables. Target behaviors were observable responses generally associated with subjective behaviors demonstrating happiness for each participant. As per annual requirements, teachers administered a school program specific communication assessment for each of the four participants to determine unique behaviors demonstrating feelings of happiness, unhappiness, enjoyment, and discomfort. Assessments were comprised of behavioral observations in which assessors recorded specific student behaviors anecdotally. Based upon assessment results for each participant, a global operational definition of happiness behaviors stated that all participants communicated or demonstrated enjoyment and happiness by smiling, laughing, maintaining eye gaze, and vocalizing. In addition, participants engaged in

Table 2: Individual student operational definitions for behaviors associated with happiness.

Student	Classroom	Indices of happiness operational definition
1	A	Smiling, laughing, maintaining eye gaze, vocalizing, reaching out with left hand, and engaging in rocking
2	A	Smiling, laughing, maintaining eye gaze, vocalizing, relaxing extremities, and turning her head towards a person/activity while opening her mouth
3	B	Smiling, laughing, maintaining eye gaze, vocalizing, raising her arms, remaining calm, and relaxing extremities
4	B	Smiling, laughing, maintaining eye gaze, vocalizing, relaxing extremities, and turning head toward activity

unique target behaviors such as reaching out with left hand or rocking (Student 1), relaxing extremities or turning head towards a person/activity while opening mouth (Student 2), raising arms or remaining calm and relaxing extremities (Student 3), and relaxing extremities or turning head towards activity (Students 4) to indicate happiness and enjoyment, which were included in individual operational definitions of happiness behaviors. A summary of assessment results and the corresponding operational definitions of happiness behaviors for each participant are shown in Table 2.

2.3.2. Data Collection. Data were collected on the occurrence of each target behavior described in Table 2. Two research assistants were employed to conduct the in-class direct observations with each research assistant responsible for data collection on two participants. The total observation session time was broken into 15-second blocks during which the frequency of happiness behaviors demonstrated (e.g., smiling, vocalizing, laughing, turning head, maintaining eye gaze, etc.) was recorded. Event recording, specifically frequency counting, was utilized for data collection with each occurrence of a happiness behavior tallied [48]. For example, if a student smiled four times and laughed twice during one 15-second observation block, the resulting data collected reflected six total behaviors demonstrating happiness for that block. Data for each participant during each instructional condition were collected for a total of three consecutive 10-minute observation sessions, each comprised of forty 15-second blocks. Data observation sessions occurred in the special education classroom, six times a day, four days per week for each participant across both instructional conditions. Hence, three of the daily observation sessions occurred during the academic instructional condition and three occurred during the functional life skills instructional condition each day.

2.4. Reliability, Fidelity, and Validity

2.4.1. Interrater Reliability. Prior to the initiation of the direct observation sessions, the primary investigator and two research assistants met with the classroom staff to discuss the method each student utilized to communicate happiness. The research assistants were then trained to recognize these happiness behaviors for each student participant. The total number of agreements between the two research assistants was divided by the number of disagreements and the resulting quotient was multiplied by 100%. Training continued until interobserver agreement remained consistently above 85% for each participant. Kennedy [49] stated that when conducting single-subject research, interrater reliability above 85% is considered an acceptable level of agreement. Interobserver agreement checks continued throughout the study to ensure reliability remained above 85%. As stated by Kennedy [49], interrater reliability checks should be conducted on a minimum of 25% of total observation sessions. In the present study, interrater reliability checks were conducted on 26% of all observations, with 13% of the reliability checks occurring during each instructional condition. Overall agreement for individual student happiness indices averaged 96% with some variability among participants, averaging 98%, 96%, 95%, and 96% for Student 1, Student 2, Student 3, and Student 4, respectively.

2.4.2. Procedural Fidelity. Two times per week, the primary investigator and the school principal went into the participating classrooms to conduct procedural fidelity checks. This inspection took place to verify the nature of instruction that was occurring in the classroom during the observation session. Days and times of procedural fidelity checks varied across each classroom, with checks occurring in both the early morning and late morning and occurring at least once each day of the week over the five-week period. Utilizing a checklist, the primary investigator and principal independently observed the classroom activity in progress for one minute to determine if the instruction being delivered encompassed functional life skills instruction or academic skills instruction. These checklists were then compared to the instructional condition noted on each of the observer's data collection forms to ensure agreement across all parties regarding the type of instruction being delivered at that specific time. Procedural fidelity checks remained at 100% throughout the investigation.

2.4.3. Internal Validity. To control for interaction effects between instructional condition and time of day, as well as between instructional condition and teaching staff, the delivery and observation of both instructional conditions were counterbalanced across days and times. This counterbalancing was dictated by the investigator and supported by the school administration. By counterbalancing across conditions, an attempt was made to equally distribute possible interactions across both conditions. Particularly, each participant was scheduled to receive instruction for the exact same amount of time during both functional life

skills instruction and academic instruction. The instructional conditions were counterbalanced to control for time of day in which each instructional condition was delivered. For example, during week one, academic instruction occurred in the early morning and functional life skills instruction in the late morning. Likewise, during week two, functional life skills instruction occurred in the early morning and academic instruction in the late morning. This counterbalancing continued throughout the five-week summer school program. In doing so, the assumption is that any possible interaction effects that occur are the result of an uncontrolled process that emerged within the established experimental arrangement [49]. Additionally, in an effort to equalize response requirements and level of physical effort, the teacher was directed to utilize the same teaching strategies across both conditions: discrete trial training, constant time delay, prompting, and reinforcement. Furthermore, expected participant responses were held constant across both conditions, including remaining awake and alert, communicating and interacting with the teaching staff, and participating in the activity as independently as possible.

2.4.4. External Validity. Controlling for external validity is a formable challenge when utilizing single-subject research designs. External validity can be enhanced by having a sufficient number of participants (at least three) in the study [50]. This single-subject study met this external validity criteria as it incorporated four participants. In addition, external validity was demonstrated by experimental effects that were replicated across settings and participants. The investigation participants included four students from diverse age groups who received instruction in two different classrooms settings.

2.5. Research Design. A single subject multielement research design [51] was used to examine the frequency of behaviors associated with happiness across two instructional conditions, functional life skills instruction, and academic skills instruction. Single subject investigations often are used in special education, specifically in the area of PMD, due to the heterogeneous nature of the population [50, 52]. According to Horner and colleagues [50], "single subject designs are organized to provide fine-grained, time-series analysis of change in a dependent variable(s) across systematic introduction or manipulations of an independent variable" (page 172). A multielement design generally is utilized when the investigation involves the rapid alteration of two or more conditions in order to determine a functional relationship between the condition(s) and the level of observed target behavior(s) [49, 52]. For this multielement research design, baseline data collection was not required since the effects of the two preexisting instructional conditions were being observed to determine if a functional relationship existed between each condition and the participants observed happiness behaviors [49]. Therefore, observations across both instructional conditions began immediately following discussions with the school staff and observer training and continued throughout the 5-week summer school program.

2.6. Procedure. Initially, the primary researcher met with the program director, assistant director, and school principal to provide basic information regarding the construct of the investigation. With the assistance of the principal and classroom teachers, an observation schedule was established to optimize opportunities to observe and collect data during both instructional conditions.

2.6.1. Condition 1. During this condition, each participant was engaged in classroom instruction that focused primarily on academic skills. For the duration of this instructional condition, students were instructed in preliteracy skills (i.e., sight word identification, letter-sound identification), prenumeracy skills (i.e., one-to-one correspondence, shape identification, calendar), and basic science facts (i.e., five senses, weather). Activities during which academic instruction were taught included morning report, reading circle, science lab, and math group. Throughout this instructional condition, students participated in large group, small group, and one-on-one instruction with all three members of the teaching staff. Each of these activities utilized teaching strategies such as discrete trial training, constant time delay, prompting, and reinforcement that were unique to each participant based on her individual learning needs. Participants were expected to participate and respond during activities by remaining awake and alert, communicating and interacting with the teaching staff, and participating in the activity as independently as possible. During the aforementioned activities, the educational staff would provide instruction based upon each student's individual annual ASOL goals. Instruction in this condition occurred for 60 minutes, one time per day.

2.6.2. Condition 2. During this condition, each participant received instruction that predominantly centered on functional life skills development. Throughout this instructional condition, the teaching staff focused instruction on self-help skills (i.e., feeding, dressing), motor skills (i.e., range of motion, massage), and independent living skills (i.e., communication, choice-making). Classroom staff delivered instruction in functional life skills during activities such as breakfast, recess, reading group, lunch, and computer circle. As in Condition 1, each of the activities which occurred during Condition 2 was delivered using teaching strategies such as discrete trial training, constant time delay, prompting, and reinforcement that were individualized based on the student's learning needs. Likewise, participants were expected to participate and respond during activities in Condition 2 by remaining awake and alert, communicating and interacting with the teaching staff, and by participating in the activity as independently as possible. During these activities, the educational staff would provide instruction on individualized education program (IEP) goals pertaining to adaptive behavior, communication, social skills, and independent living. The majority of instruction delivered during this condition occurred via small group or one-to-one instruction. Again, all members of the teaching staff from each classroom were actively engaged in delivery of instruction which occurred for 60 minutes, one time per school day.

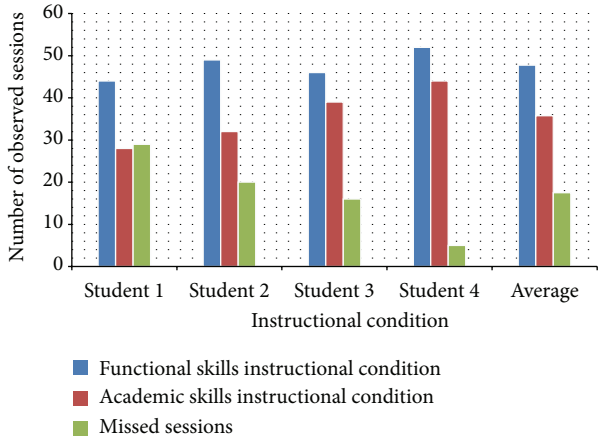

Figure 1: Total number of observation sessions for each participant.

3. Results

The purpose of this investigation was to ascertain the potential existence of a link between teaching academic skills and an improvement in quality of life for students with profound multiple disabilities (PMD) as demonstrated through an increased number of happiness behaviors during academic instruction. For this reason, the present study attempted to evaluate the existence of a relationship between teaching academic content and a display of positive quality of life for students with PMD. Through visual analysis of the data and calculation of the frequency of expressed happiness behaviors by participants, a difference in the level of happiness behaviors demonstrated by each participant between conditions was revealed.

3.1. Instructional Condition Data. Figure 1 presents the total number of observation sessions per instructional condition for each participant. Each participant received instruction during both functional life skills and academic skills conditions. In addition, each participant had instructional sessions that were categorized as a missed session. A missed session was defined as one in which participants were engaged in activities unrelated to the two target instructional conditions (i.e., personal care, dozing, and medical intervention) so a completed observation session could not occur. Due to the significant medical needs of the participants, missed sessions were expected. Missed sessions were not included in the frequency of behaviors associated with happiness data.

3.2. Participant Data

3.2.1. Student 1. The observed happiness behaviors for Student 1 are displayed in Figure 2. Student 1 was observed across 108 sessions, 44 (40.7%) of which occurred during functional life skills instruction and 27 (25.0%) during academic skills instruction. The remaining 37 (34.3%) observation sessions were classified as missed sessions and therefore omitted. Of the sessions classified as missing, 21 occurred during the functional life skills instructional condition and 16 occurred during the academic instructional condition. Student 1 displayed a total of 1130 behaviors defined as expressions of happiness, 651 during the functional life skills instructional condition and 479 during the academic skills instructional condition. The ranges of observed happiness behaviors for functional life skills and academic skills instruction per observation session were 0–31 and 0–29, respectively.

3.2.2. Student 2. Observed happiness behaviors for Student 2 are displayed in Figure 3. Student 2 was observed across 108 sessions, 49 (45.4%) of which occurred during functional life skills instruction and 32 (29.6%) occurred during academic skills instruction. The remaining 27 (25.0%) observation sessions were considered missed sessions and were omitted from the frequency count. Of the sessions designated as missing, 17 occurred during the functional life skills instructional condition and 10 occurred during the academic instructional condition. Student 2 displayed a total of 510 behaviors defined as those associated with happiness, 246 during the functional life skills instructional condition and 264 during the academic skills instructional condition. The ranges of perceived happiness behaviors per observation session for functional life skills and academic skills instructional conditions were 0–13 and 0–27, respectively.

3.2.3. Student 3. The observed happiness behaviors for Student 3 are displayed in Figure 4. During 108 sessions, Student 3 was observed during 45 (41.7%) functional life skills instruction sessions and 38 (35.2%) academic skills instruction sessions. Student 3 missed 25 (23.1%) instructional sessions, 14 occurring during the functional life skills instructional condition and 11 occurring during the academic skills instructional condition. Student 3 displayed a total of 1054 behaviors defined as expressions of happiness, 446 during the functional life skills instructional condition and 608 during the academic skills instructional condition. The ranges of happiness behaviors observed during functional life skills and academic skills instruction observation sessions were 1–29 and 3–39, respectively.

3.2.4. Student 4. The observed happiness behaviors for Student 4 are displayed in Figure 5. Student 4 was observed across 108 sessions, 52 (48.2%) of which occurred during functional life skills instruction and 44 (40.7%) occurred during academic skills instruction. The remaining 12 (11.1%) observation sessions were classified as missed sessions with 7 occurring during the functional life skills instructional condition and 5 occurring during the academic skills instruction. Student 4 displayed a total of 448 behaviors associated with happiness, 183 during the functional life skills instructional condition and 265 during the academic skills instructional condition. The ranges of observed happiness behaviors during functional life skills and academic skills instruction observation sessions were 0–20 and 0–25, respectively.

3.2.5. Total Happiness Behaviors. Table 3 presents the mean occurrence of happiness behaviors per instructional condition for all participants. For all participants, the frequency

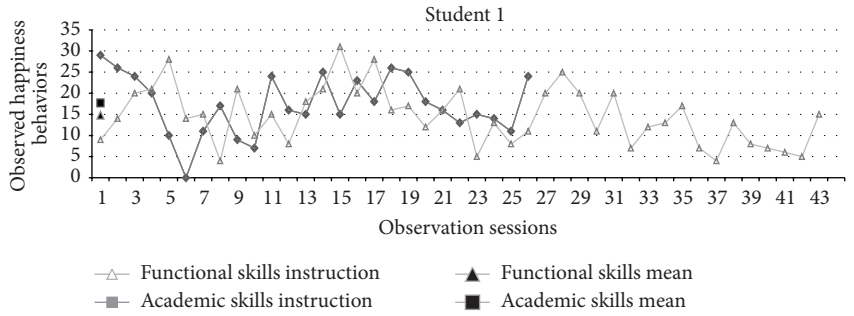

Figure 2: Total frequency of behaviors associated with happiness per observation session for Student 1.

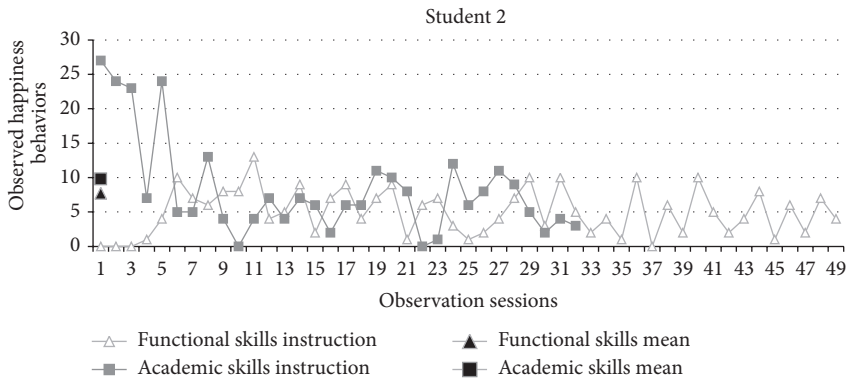

Figure 3: Total frequency of behaviors associated with happiness per observation session for Student 2.

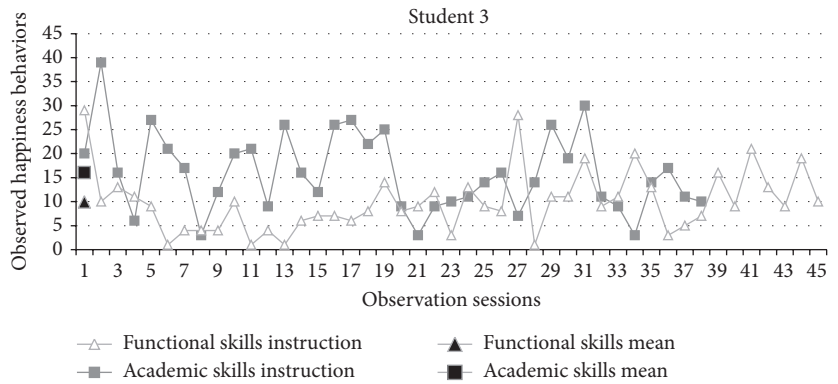

Figure 4: Total frequency of behaviors associated with happiness per observation session for Student 3.

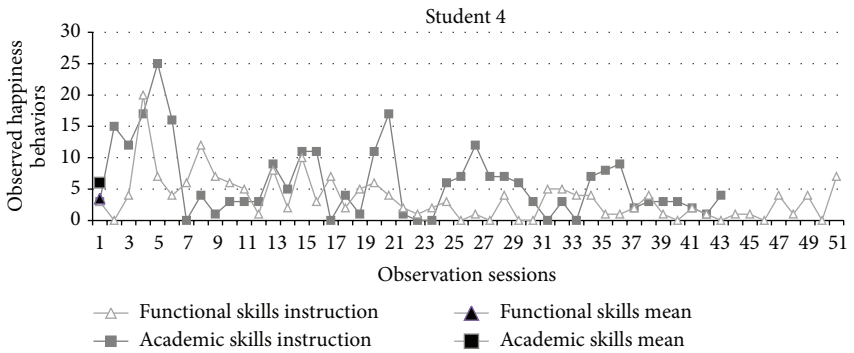

Figure 5: Total frequency of behaviors associated with happiness per observation session for Student 4.

Table 3: Mean occurrence of behaviors associated with happiness per instructional condition.

Student	Total happiness behaviors		Total observed sessions ($n = 108$)			Mean happiness behaviors per condition	
	Functional	Academic	Functional	Academic	Missed	Functional	Academic
1	651	479	44	27	37	14.8	17.7
2	246	264	49	32	27	7.7	9.8
3	446	608	45	38	25	9.9	16
4	183	265	52	44	12	3.6	6.0

of displayed behaviors associated with happiness was higher during the academic skills instructional condition. For Student 1, a comparison of happiness behaviors between the functional life skills instructional condition and the academic skills condition indicated that more behaviors associated with happiness were demonstrated per session during the academic instructional condition (17.7 versus 14.8). A comparison of observed happiness behaviors between the functional life skills instructional condition and the academic skills condition for Student 2 indicated that behaviors associated with happiness were demonstrated at a higher rate per session during the academic instructional condition (9.8 versus 7.7). For Student 3, a comparison of happiness behaviors between the functional life skills instructional condition and the academic skills condition indicated that behaviors associated with happiness were demonstrated more often during the academic instructional condition (16.0 versus 9.9). Finally, a comparison of happiness behaviors between the functional life skills instructional condition and the academic skills condition for Student 4 indicated that more behaviors associated with happiness were demonstrated per observation session during the academic instructional condition (6.0 versus 3.5).

4. Discussion

The purpose of conducting the present study was to evaluate whether a link between teaching academics skills and an improvement in the quality of life for students with profound multiple disabilities (PMD) could be established. The findings of this study demonstrated a potential relationship between academic skills instruction and increased occurrence of unique behaviors associated with happiness for each of the four participants. For all four participants, the mean occurrence of observed happiness behaviors for total observation sessions was higher during the academic skills instruction condition than during the functional life skills instruction condition. As reported in previous investigations [40, 41, 45, 53] instructional conditions in which the participants were exposed to preferred activities appeared to elicit greater measurable behaviors associated with happiness than sessions involving nonpreferred activities. Results from the present study regarding the comparing of academic and functional life skills instruction seem to suggest that teaching academic skills result in elevated behaviors associated with happiness for some students with PMD. Particularly, the results demonstrated by Students 3 and 4 may characterize the most representative results since these participants received fairly balanced instruction in both conditions. Student 3 demonstrated happiness behaviors on average 9.9 times during 43 functional life skills instruction observations compared to a measured happiness behaviors average of 16.0 times during 40 academic skills observation sessions. Likewise, Student 4 demonstrated behaviors associated with happiness an average of 3.5 times during 52 functional life skills instruction observations compared to measured happiness behaviors averaging 6.0 times during 44 academic skills instruction observation sessions. A major reason to apply quality of life concepts to research for individuals with PMD is to determine if providing instruction in these concept areas enhances students' satisfaction and overall well-being [54, 55]. Because the participants in this study displayed higher indices of happiness during the academic skills instructional condition, the results suggest that there are likely benefits for teaching academic content to students with PMD that extend beyond basic instruction and acquisition of skills.

Presently, special educators are challenged with creating and implementing effective educational strategies that blend functional life skills and academic skills instruction for students with PMD. Historically, the majority of research conducted with individuals with PMD examined variables that affected skill acquisition with little attention to assessing the broader concern of the individual's quality of life [53]. Although research on the success of teaching functional life skills is documented [4, 15], this study sought to establish a potential link between increased quality of life and the teaching of academic content to students with PMD by documenting the potential positive impact of this instruction. As indicated by Agran and colleagues [5], one of the primary reasons why special education teachers prefer not to teach academic content to students with PMD is the inability to determine the potential gains of teaching this material to their students. The results of the present study suggest that some students with PMD who receive academic instruction may experience more "happiness" which presents a reasonable rationale to provide this type of instruction. Besides providing positive teacher-student interactions, academic instruction may also improve communication skills, increase social interactions, and increase desirable post school outcomes [14, 15].

Supplemental outcomes of this study are consistent with results found in the existing literature. For example, Lyons [38] reported that the daily routine of a child with PMD is characterized by frequent, extended periods of direct care interactions followed by shorter periods of independent activities. Despite an effort to equalize instructional time

across conditions, the majority of classroom time in the targeted classrooms used for this study focused on direct care interactions (i.e., toileting, medical intervention), functional life skills instruction including self-help (i.e., feeding, dressing), range of motion activities (i.e., massage, exercising), and independent living skills (i.e., communication, choice-making). Overall, classroom instruction targeting the aforementioned conditions averaged 44.0% for all participants, with some variability among participants, averaging 40.7%, 45.4%, 41.7%, and 48.2% for Student 1, Student 2, Student 3, and Student 4, respectively. Instructional time observed during this study that was dedicated to teaching academic skills (i.e., preliteracy, prenumeracy, basic science) averaged 36.6% for all participants with individual averages of 25.0%, 29.6%, 35.2%, and 40.7% for Student 1, Student 2, Student 3, and Student 4. The remaining sessions classified as missed sessions were those in which the student was receiving medical intervention, self-care activities, or dozing. These sessions accounted for an average of 23.4% of the observations for all participants and 34.3%, 25.0%, 23.2%, and 11.1%, respectively, for Student 1, Student 2, Student 3, and Student 4. The potential for many individuals with PMD to spend a substantial amount of time involved in less stimulating routines may lead to a weakened sense of well-being and personal satisfaction. This new focus on increasing behaviors associated with happiness may mean putting forth an effort to balance instructional time between academic skills instruction and functional life skills instruction while providing the student with engaging and effective programming.

5. Limitations

Although the results of this investigation may be encouraging to those who support increasing the amount of academic skills instruction to students with PMD, some limitations should be noted. The small sample size of the participants and the fact that all participants received instruction in self-contained classrooms housed within the same regional public day school program limit the generalizability of the findings. Secondly, due to the nature of the regional public day school summer program in which the study was conducted, the total investigation encompassed only five weeks of instruction. Different outcomes may have occurred had the investigation been conducted over a longer period of time. A third limitation was a lack of guidance given to the teachers regarding the delivery of instruction during both conditions. This stipulation fulfilled a necessary arrangement constituted by the school program requesting that instructional practices remain unaltered. Although each teacher was directed to use teaching strategies such as discrete trial training, constant time delay, prompting, and reinforcement, no data was taken on the use or absence of these strategies across conditions. Because of this, an uncontrolled variable could be the teacher's chosen method for delivering instruction. A fourth limitation of the study was the inability to equally observe each condition. Despite initial planning with the principal and classroom teachers regarding classroom scheduling, uncontrolled circumstances arose that altered the classroom schedule. This unequal distribution of instruction may represent past formal education exposure which limited access to academic curriculum; therefore, the increase in occurrence of behaviors associated with happiness could be associated with the novelty of the instruction itself. A final limitation was the lack of objective measures of happiness. Because of the communicative abilities of the participants, they were not able to self-report indices of happiness. Therefore, the investigation recorded only objective indices of happiness reported by the teachers via a communication assessment, not through a preference assessment completed by the actual participant. Although some researchers [31, 33, 56–58] have determined proxy reports (objective) to be valid as a means of interpreting another individual's index of happiness, it is recommended that researchers attempt to measure both subjective and objective indicators simultaneously when assessing the quality of life of individuals with PMD when possible [54]. For example, subjective self-report preference assessment measures in which individuals responded in their desired mode of communication (i.e., eye gaze, augmentative communication, picture symbols, etc.) would be supplemented with objective measures, such as direct observation or proxy report.

6. Implications and Recommendations for Future Research

The results of the present study suggest that students with PMD demonstrate higher rates of happiness indices when they are receiving academic instruction than when they receive functional life skills instruction. Assuming these findings are representative, special educators should attempt to concentrate their efforts on identifying and planning for positive quality of life opportunities for students with PMD, while determining which educational strategies provide the most appropriate blending of functional life skills instruction and participation in the general education curriculum [29, 42, 43]. This research does not intend to support the abandonment of teaching sound functional life skills. Conversely, future research should focus on the implications of teaching all skill areas, including academics skills and functional life skills, with techniques such as positive interactions and allowing personal choice which have the potential to increase indices of happiness and overall quality of life. As Agran and colleagues [5] stated, practitioners, including special educators, in the field of PMD have conflicting views regarding the potential benefits of teaching academic content to students with PMD. This study suggests that one potential benefit is that this kind of instruction has the potential to increase the happiness level of the students which could positively influence their overall quality of life. Future research should continue to address not only access to the general education curriculum for students with PMD, but also focus on specific aspects of various instructional strategies and conditions that impact students' overall quality of life. Additionally, future research should speak to methods for making functional life skills curriculum more reinforcing in efforts to increase the number of behaviors associated with

happiness displayed during this important and necessary instruction. In order to do this, special educators will need to utilize the results of effective quality of life assessment tools for students with PMD when planning and implementing appropriate instructional strategies. To date, there is a scarcity of assessment tools available to measure the quality of life of individuals with PMD [28, 59, 60]. Future research should continue to address the lack of valid measurement tools to assess the quality of life of individuals with PMD and examine other teacher friendly ways to determine if this outcome is being achieved. Furthermore, research should focus on the validation of behaviors that are representative of happiness in individuals with PMD. Additionally, in the field of PMD there is a dearth of research literature that links quality of life concepts to educational reform. Quality of life assessments can, and should, be another measure used to evaluate the effectiveness of special education programming for this population [6, 39, 43].

Finally, future research should consider the design and implementation of an educational curriculum for students with PMD that directly combines content from both academic curriculum and functional life skills. Rather than continuing to teach these skills in isolation, the combination of these two curricula may present a more effective teaching model as it would address both critical skill areas while potentially maintaining higher levels of engagement and interaction among students with PMD.

7. Conclusion

In the United States in recent years, perceptions have moved from a deficit to a competence-based perspective for students with PMD. Regardless of the severity of the individual's disabilities, educators are now considering an individual's overall capabilities, preferences, and engagement in activities when developing appropriate interventions. Focusing upon and enhancing the strengths and capabilities of these individuals may offer them additional opportunities to have meaningful and pleasurable participation in school and, in turn, more positive educational outcomes. As such, by identifying classroom activities that result in an increase in positive participation and happiness, educators may begin to adapt and design skill acquisition activities that lead to an improved quality of life for students with PMD. Finally, by using quality of life indicators when designing programs, special educators may be able to successfully decrease the potential unpleasantness of school while increasing skill acquisition, happiness, and self-determination.

Conflict of Interests

The author declares that there is no conflict of interests regarding the publication of this paper.

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