# Effects of Goal-Setting Instruction on the English Performance of Students with Learning Disabilities: A Single-Case Study in the United States

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Substantial research has indicated that students with learning disabilities (LDs) in high schools exhibit poor academic performance in the United States. Researchers and educators have expended efforts to alleviate the learning difficulties of students with LDs by implementing various strategies and instruments. Self-determination skills have been recommended as an effective intervention for increasing academic, behavioral, and employment performance for students with LDs. However, few studies have provided evidence of self-determination through in situ observations. **Purpose**: This study applied a single-case design approach for enhancing the effectiveness of self-determination skills by implementing the Take Action lesson package. The main purpose of this study was to examine the academic effects of Take Action instruction on goal-attainment knowledge regarding the English scores of students with LDs individually. **Method:** Four high school students with LDs in an English resource classroom individually received approximately 200 hrs of Take Action instruction. Specifically, the authors used a multiple-baseline across-subjects design to collect the Take Action scores and English scores of the four students before and after Take Action instruction separately in a tutoring room. Collected data were used to compare the coefficient correlations and ratios of median differences between each student's baseline and postintervention scores. **Results/Findings:** The coefficient correlation results indicated that the postintervention scores of each student (Amy, Bill, Corey, and Evan) were higher than the baseline scores. The trends of the interventions for Amy (R' = 0.96), Bill (R' = 0.35), Corey (R' = 0.32), and Evan (R' =

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0.94) indicated increases. In addition, the ratios of the median differences of English scores and Take Action scores indicated that each student's English scores improved after Take Action instruction. The results suggested a functional relationship between Take Action instruction and English scores for each student. **Conclusions/Implications:** (a) Learning self-determination skills can increase English scores of students with LDs; (b) students with LDs can implement Take Action skills spontaneously; (c) after receiving Take Action instruction, students become more responsible for their school work than they were before instruction; and (d) according to the instructor who participated in this study, the Take Action lesson package is effective and simple to use. However, when using the Take Action lesson package, it is crucial for the instructor to conduct activities, such as card matching, presentations, and class projects, to enhance students' motivation and application of the learning material. Finally, we suggest that instructors use this lesson package to help students attain their Individualized Educational Program goals to improve their achievement in school.

# Introduction

Although all students are expected to learn and succeed in school, students with learning disabilities (LDs) are prone to experiencing continuous failure in academic performance. In the United States, 2.4 million students have been diagnosed with LDs, and 41% of them receive special education services (Learning Disabilities Association of America, n.d.). According to the National Longitudinal Transition Study-2, academic failure has resulted in the dropout rate of secondary students with LDs being considerably higher than that of students without LDs. For most educators, it can be a challenge to assist students with LDs and enable them to meet the academic requirements in school, especially, in high school. However, if educators fail to implement the appropriate teaching strategies, students with LDs often fail in learning and may exhibit other problematic behaviors in school, potentially interfering with post-school outcomes.

Self-determination has been viewed as an essential set of skills that can increase student success in school (Ryan & Deci, 2000). A person who is more self-determined exhibits strong intrinsic motivation in achieving his or her goal through various effective strategies, in which a person does something because of its interesting and enjoyable could produce higher quality of learning. The increased competence nurtures human desires and satisfies human needs (American Psychological Association, 2004). Self-determination comprises self-awareness, self-advocacy, self-efficacy, decision-making, independent performance, self-evaluation, and ad-justment (Wehmeyer, 1999; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). Self-determination can enhance a person's ability to take control of his or her live and achieve an improved quality of life (Mithaug, Mithaug, Agran, Martin, & Wehmeyer, 2007). Researchers believe that self-determination skills can be taught, learned, applied, and adapted in various settings (Wehmeyer, 1999; Wehmeyer et al., 2000).

Empirical studies have presented evidence for the need for teaching students with LDs self-determination skills (S. Field, Sarver, & Shaw, 2003; T. Field, 1996; Pierson, Carter, Lane, & Glaeser, 2008). Trainor (2007) interviewed female high school students with LDs about the perceptions of self-determination, and the results indicated that although students perceived themselves as self-determined, they lacked several components of self-determination. Meta-analyses of studies that used single-subject,[1] correlation, or quasi-experimental designs yielded empirical evidence regarding the effectiveness of self-determination interventions in promoting student academic, behavioral, and employment outcomes (Cobb, Lehmann, Newman-Gonchar, & Alwell, 2009).

Goal attainment is the ultimate stage when someone becomes self-determined. Students must be self-determined to be capable of knowing their self, making choices, developing evaluation plans, identifying solutions and resources, and finally, attaining certain goals. People cannot be self-determined without accomplishing the final step, acting out. Although goal attainment is an essential self-determination skill, most students with LDs do not know how to establish, plan, and achieve their goals (Pocock et al., 2002; Prater,

Redman, Anderson, & Gibb, 2014). Researchers have suggested that when a teacher provided goal-oriented instruction in the classroom, it was easier for students with LDs to recognize, plan, and achieve their goals and improve their academic outcomes (Mithaug et al., 2007; Pocock et al., 2002; Prater et al., 2014).

　　To teach self-determination skills to students with LDs, numerous educators and researchers have developed self-determination curricula. Hoffman and Field (1995) used *Steps to Self-Determination* to teach students with LDs goal setting, including steps to reach goals and plan, and determined that students who adopted this curriculum increased their knowledge of self-determination. Serna and Lau-Smith (1995) used the self-determination curriculum *Learning with Purpose* to teach students with LDs social, self-evaluation, self-direction, networking, collaboration, and persistence and risk-taking skills, as well as stress management to prepare them for the transition to their future work places before they left school. Martin et al. (2003) determined that using a self-determination curriculum enabled students with LDs to learn how to regulate their behaviors and adjust them to changing demands in class. Prater et al. (2014) trained four high school students with LDs self-advocate skills to improve their communication. Wehmeyer, Palmer, Shogren, Williams-Diehm, and Soukup (2013) conducted a 3-year study and determined that students with ID (Intellectual Disabilities) and LDs who received self-determination intervention exhibited a pronounced increase in self-determination.

　　The *ChoiceMaker* curriculum developed by Martin, Huber Marshall, and Maxson (1993) and Martin and Huber Marshall (1995) can be used to teach students crucial self-determination skills. It comprises three parts: *Choosing Goals, Expressing Goals, and Taking Action*. *Choosing Goals* (choosing education goals, choosing employment goals, and choosing personal goals) teaches students with LDs to identify their interests, skills, limits, and goals. *Expressing Goals* (self-directed individualized education program [IEP]) teaches students with disabilities how to lead their IEP meetings and express their interests, skills, and goals. *Take Action* (Making Goals Happen) is the final and essential part of the *ChoiceMaker* curriculum, because this part of the instruction requires students to use the previously acquired knowledge and skills to achieve their goals. Without taking action students are likely to never know if the learned skills enable them to reach their goals. The primary purpose of the *Take Action* curriculum is to teach students how to attain their goals. Two previous studies have examined the efficacy of *Take Action* (German, Martin, Marshall, & Sale, 2000; Walden, 2002). German et al. (2000) used *Take Action* to teach six adolescents with mild to moderate intellectual disabilities to attain daily IEP goals and determined that the students successfully applied their knowledge of goal attainment to attain and maintain their individual IEP goals. Walden (2002) used *Take Action* to teach five college students with LDs self-determination skills to determine if *Take Action* was sufficient for college students with LDs, generalizing take action skills across time after the instruction. Walden (2002) determined that college students with LDs generalized their knowledge of goal attainment and exhibited take action skills; however, generalization over time

did not occur. German's (2000) and Walden's (2002) studies have suggested that *Take Action* is an efficient lesson package consisting of a single-subject design.

Although self-determination instruction has been widely used to increase the self-determination skills of students with disabilities, the academic effects of goal attainment skills for students with LDs have not been addressed. The academic effects include the students' academic outcomes in school such as the grades in English, Math, and other subjects. This study involved using the *Take Action* curriculum as a primary instructional tool for teaching students with LDs individually how to set and reach their goals. The students' goals were directly connected to their current English class. Therefore, the students were able to examine if the plans they developed facilitated reaching the goals of improving their English grades. Comparing the change of students' English grades and the *Take Action* curriculum scores before and after the intervention of the *Take Action* curriculum provided data regarding the relationship of the English grades and the *Take Action* curriculum. The purpose of this study was to examine both students' knowledge and English grades after using the *Take Action* curriculum. This study included only students with LDs and involved attempting to determine if the *Take Action* instruction influenced the English learning of students with LDs. The following research questions were addressed: (a) Do students with LDs acquire goal-attainment skills after receiving the *Take Action*? (b) Does the *Take Action* knowledge influence their English test scores?

# Methods

## Participants

Four students with LDs indicated willingness to participate in this study, and consent forms obtained from the school's principal were completed by the parents of the students. The four students comprised two girls and two boys (pseudonyms were used for this study) with LDs who signed assent forms and participated in this study. Their ages ranged from 16 to 17 years. The following recruitment criteria were applied: (a) the students were in the $9^{th}$ or $10^{th}$ grades, (b) they participated in both general education classrooms and resource classrooms, and (c) they were identified as having LDs by the school psychologist, were considered as having lower-than-average intellectual ability, and exhibited considerable discrepancies between their IQ scores and their academic outcomes (Table 1).

As shown in Table 1, Amy, Bill, and Evan were ninth graders whose IQ was 87, 85, and 81; reading level was 4.7, 5.1, and 7.1; writing level was 5.2, 4.0, and 6.4, respectively. Corey was the only $10^{th}$ grader in this study. Corey was 17 years old and had an IQ of 81; his reading and writing levels were 7.9 and 7.0, respectively. Three of these four students had experienced physical or sexual abuse, parental neglect, or parental drug addiction. One of the students had a history of suicide attempts and received school counseling services once a week. Two of the students exhibited behavioral problems such as a difficulty in obeying the instructions of teachers or displaying attention deficit in class. All of the students had low self-esteem. Three had poor family support;

Table 1　Participant Characteristics

| Student | Diagnosis | Gender | Age | Grade | Resource room | IQ* | Reading Level | Writing Level |
|---------|-----------|--------|-----|-------|---------------|-----|---------------|---------------|
| Amy | Learning Disabilities | F | 16.1 | 9 | Reading, Math, English | 87 | 4.7 | 5.2 |
| Bill | Learning Disabilities | M | 16.2 | 9 | Math & English | 85 | 5.1 | 4.0 |
| Corey | Learning Disabilities | M | 17 | 10 | Math & English | 81 | 7.9 | 7.0 |
| Evan | Learning Disabilities | F | 16.4 | 9 | Math & English | 81 | 7.1 | 6.4 |

* measured by WISC III

one lived in a foster home, and one lived with relatives. All four students received a public educational treatment program for students with LDs. Amy and Bill exhibited a low motivation in class and low self-esteem. Amy exhibited attention deficit, and Bill often refused to obey the instructions of teachers in class. Evan exhibited attention deficit and problems with social relationships in class, which meant it was difficult for her to maintain friendship with other classmates. The special educational teacher contended that Corey exhibited no problematic behavior in class. All of the participants frequented the same Math and English resource classrooms.

## Settings

This study was conducted in a rural high school with 635 students in a southeastern state of the United States. A total of 127of the students exhibited LDs. Three students (i.e., Amy, Bill, Evan) participated in the same general education class with one general education teacher. Corey participated in another general education class with a different general education teacher. All of the students attended an English resource classroom together; they were in the resource room on Tuesdays, Wednesdays, Thursdays, and Fridays. When they were not in the resource room, they attended general education classes. Each participant received the interventions in a small tutoring room next to the English resource classroom. The observer individually collected the *Take Action* data in the tutoring room and the English test scores in the English resource room. The researchers conducted intervention sessions on 2 days per week from 10:50 to11:40 a.m. The length of each intervention session ranged from 30 to 40 min. The total tutoring time was 1120 min per student.

Two teachers[2] were in the tutoring room; one was the teacher, and the other one was the researcher. The teacher individually taught the *Take Action* instructions in the tutoring room, while the researcher collected data from the observation window of the classroom. At the end of instruction, the students received homework related to the English class.

## Materials

The teacher taught the students seven lessons of the *Take Action* lesson package including goal-attainment skills; the instruction involved learning to plan, act, evaluate, and adjust goals, as depicted in Table 2.

Table 2　Take Action Curriculum Content

| Lesson | Content | Materials |
|---|---|---|
| Lesson 1 | The introduction of Take Action steps (plan, act, evaluate, and adjust) and taught students to break a long-term goal into short-term goals and the differences between long-term and short-term goals. | Overhead projector<br>Take Action video<br>Transparencies<br>Class notes |
| Lesson 2 | The goal of Lesson 2 helps students plan, and the objectives were to establish standard for short-term goals, determine motivation to complete specific goals, determine strategies for completing specific goals. | Overhead projector<br>Worksheets<br>Transparencies<br>Class notes |
| Lesson 3 | Review the example long-term and short-term goals and teach "support" and "feedback" for completing specific goals. | Overhead projector<br>Worksheets<br>Transparencies<br>Class notes |
| Lesson 4 | The teacher models using the Take Action Plan critique worksheet to critique each plan and predict how well each part will work. Students complete the same process for another sample student situation. | Overhead projector<br>Worksheets<br>Transparencies<br>Class notes |
| Lesson 5 | Review Lesson 1-4. Students individually develop a short-term goal and a plan for a class long-term goal. Students critique their plans in pairs. | Activity (Matching cards) |
| Lesson 6 | Review previous lessons. The class reads how Michelle Pass acted on her plan. The class evaluates and adjusts the plan in pairs. Students individually evaluate and adjust their plans and present to the class. | Overhead projector<br>Worksheets<br>Transparencies<br>Class notes |
| Lesson 7 | Students choose a long-term goal they want to accomplish and break down into short-term goals and choose one to work on now. Students write plans, critique, evaluate, and adjust their plans in class. | Overhead projector<br>Worksheets<br>Transparencies<br>Class notes |

As the lessons progressed, the students learned to break long-term into short-term goals and create a plan by learning to answer the following six questions:[3] (1) What will I be satisfied with? (2) Why do I want to do this? (3) What methods should I use? (4) What help do I need? (5) When will I do it? (6) How will I obtain information regarding my performance? Each lesson lasted 50 min, including 5 min for the pretest and 5 min for the posttest. In this study, students picked a long-term goal they wanted to accomplish in the English class, broke it into short-term

goals, and chose one to work on.

## Design

To answer two research questions, this study used a multiple-baseline across subjects design (Gast, 2010) to determine how *Take Action* lessons influenced the students' goal-attainment skills and the English test. To contrast the initial conditions and later outcomes, the researcher used baseline data to track the changes in student performance. First, the researcher collected the *Take Action* and English scores for each participant before applying the *Take Action* instruction as the baseline data. The student with the lowest and most stable scores among the four participants underwent the *Take Action* instruction first. After the scores of the first student improved, the second student received the *Take Action* instruction, and when the second student exhibited improved *Take Action* scores, the third and the fourth students followed the same procedures. After the *Take Action* instruction, the researcher examined the effects on the English scores.

## Dependent and Independent Variables

The independent variable of this study included the instruction of the *Take Action* lesson package. This study involved collecting data on two dependent variables. The first primary dependent variable was the students' *Take Action* scores, defined as the students' ability to answer seven lesson questions. A focus group, including an English teacher, the teacher, and the researcher developed *Take Action* tests by reviewing contents of three parts of the *Take Action* instruction. In addition, the group members completed the

social validity of test questions. The focus group members divided the *Take Action* lessons into three parts, each of which contained two or three tests. The Part I test included Lesson 1 and 2; the Part II test included Lesson 3 and 4, and the Part III test included Lesson 5, 6, and 7. The students required approximately 5 min to complete the - test. The focus group decided on three types of tests, including true/false, matching, and short answers. The Part I test contained true/false questions, the Part II test involved a matching-terms format, and the Part III test consisted of short answer questions. Part II listed 10 questions in two columns. Column I contained terms, and Column II contained definitions. The students had to write the letter of a correct description in a blank field in front of each term. The question contents of the Part III tests corresponded to the previously mentioned six plan parts and short-term and long-term goals of the students' English class.

The teacher gave the students a pretest, read each question aloud each time before providing the intervention, and collected the scores as the baseline data. The students received no additional information or assistance. Each pretest took each student 5–10 min to complete. *Take Action* instructions would not occur until *Take Action* scores stayed low.

The students were evaluated according to two dependent variables. The first dependent variable[4] was the test score of the *Take Action* instructions. The researcher scored answer sheets in the range from 0 to 10 points. One point represented 10% of correctness rate. The total correctness rate was the outcome of the dependent variable and denoted on each participant's graph. For example, if the participant obtained six correct

answers out of 10 questions, the correctness rate was 60%. The rate enabled the researcher to compare the students' knowledge of the *Take Action* process to the second dependent variable.[5]

The second dependent variable was a measure of the students' English scores. The participants received English scores at the end of the English class. The English teacher developed quizzes based on the content of each class. The English test included four major domains: (a) adjectives, (b) adverbs, (c) antonyms, synonyms, and homonyms, and (d) clauses. The English teacher provided the students with a syllabus to enable them to follow the teaching progress and set goals and plans.

## Procedures

The teacher individually taught the lesson package in the tutoring room. She had been a special education teacher for more than 2 years and had completed a bachelor's degree in special education a year earlier. The researcher, who collected data, was a special education teacher with a Ph.D. in special education and 9 years of experience in teaching high school students with LDs. Confounding factors may have influenced the results of the *Take Action* and English scores, for example, the attitude of the teacher, mood of the students, classroom settings, and the interaction between the teacher and the student. To maintain consistent of instructions, each student in the tutoring room received the same instructional procedures.

The students wrote plans for short-term goals and critiqued plans with the teacher. The teacher modified the content of the lessons to be appropriate for the participants' reading level. She gave

each student class notes to enable him/her to understand the lesson content. During or after the instruction, each student received a worksheet, which included the content of the day's lesson, for review and practice. Self-evaluation encouraged the students to monitor their English test plan. After completing one part of the *Take Action* lessons, all four students presented their progress to other students in their English class, and the classmates provided feedback. After discussions, each student had opportunities to adjust his or her plans and goals. The students recorded their progress and thoughts in a daily journal. If necessary, the teacher met the students individually to discuss their needs and accommodations.

## Intervention Procedures

*Preintervention.* Following the class introduction, the teacher and students established ground rules for the class. These included (a) raising a hand before talking, (b) using appropriate words to communicate, (c) remaining in seats unless the students had permission from the teacher to stand, and (d) completing homework on time. The ground rules enabled the teacher to establish her role as an instructor and improve student participation in class. After instruction, the teacher provided oral praise and occasionally reinforcers, such as candy, chocolate, and soda to reward full participation in class. All of the participants followed the same ground rules during the instructional sessions.

During the first preintervention day, the teacher explained the purpose of this study and the importance of goal-attainment skills. The teacher requested the students to write down their future vision in a journal and talk about their indi-

vidual goals. For example, Amy wanted to be a physical pathologist, Bill wanted to be a welder, Corey wanted to be a doctor, and Evan wanted to be a Marine. The purpose of this conversation was to increase the learning motivation regarding goal-attainment skills. Furthermore, the teacher requested the students to write down their goals regarding English individually.

*Intervention.* Before the *Take Action* interventions, the students participated in pretests. The student who received the lowest average score of the pretest received the instruction first. The order of receiving instruction was based on the scores, which represented the baseline data of each student. Therefore, the interventions were performed in the following order: Amy, Bill, Corey, and Evan. The instruction involved employing the teaching material of the *Take Action* lesson package, including a description, demonstration, practice, and discussion. Before classes began, the teacher wrote new vocabulary items in the right-hand corner of the whiteboard. The purpose of writing vocabulary on the board was to help each student recognize and memorize the key terms of the new lesson.

During the intervention phase, the teacher asked the students to complete a5-min pretest. The teacher reviewed the previous lesson and introduced the new lesson. She then used transparencies from the *Take Action* worksheets to explain the new lesson and give examples. The instruction included description, demonstration, practice, and discussion. The observer had an instruction checklist for maintaining that the teacher taught the same instructional procedures. After each instruction, each student completed a posttest for 5 to 10 min. The researcher observed

and collected the students' English scores in the English classes.

*Activities.* Between Lessons 1 and 6, the teacher enhanced the students' goal-attainment skills. Concurrently, the teacher applied certain instructional strategies to increase student participation. For example, asking questions paired with reinforcers, or designing activities to aid students in memorizing the content of lessons, including "a jeopardy game," matching cards, presentations, and a class project. In Lesson7, the teacher guided a student in making a plan to attain an English short-term goal, and requested the student to ask for comments or suggestions regarding his or her plan from the other students. The student then reported on the feedback from the other students to the teacher and revised his or her plan with the teacher accordingly. The student had to request his or her English scores from the English teacher to ensure the achievement of the short-term goal. For example, in one English quiz, Amy's English score was set to 80 for her English short-term goal. To achieve Amy's target, she designed the content of the six-part plan (standard, motivation, strategy, schedule, support, and feedback), and revised her plan through feedback and comments from her classmates and the teacher. Finally, she asked for the English scores from the English teacher to determine whether her plan was sufficient for achieving her English short-term goal. At the end of the *Take Action* lessons, each student demonstrated his or her learning process. Each student explained how he or she broke their long-term goal into several short-term goals and developed their six-part plans to achieve their short-term goals.

## Interobserver Reliability

*Interobserver agreement*. To ensure that the teacher and the observer applied similar standards for grading the *Take Action* tests, interobserver agreement (IOA) was used as an indicator to represent the degree of interobserver reliability. IOA was defined as the number of agreements divided by the total number of class sessions, multiplied by 100. This study showed that the IOA ranged from 75% –90% and averaged 82.25%. The results showed that the grading of the teacher was not consistent with that of the researcher, which might indicate an internal threat of this study. Consequently, the teacher and the researcher repeatedly reviewed the scoring sheets, compared the data collection sheets, and discussed grading discrepancies until there was 100% agreement during the observation periods.

*Instructional consistency.* This study involved using *Take Action* instructions as an independent variable. The observer used the instructional checklist to ensure that the teacher followed the same teaching procedure. The checklist comprised the following items: (a) the introduction of the lesson, (b) the teacher's modeling of the skill or strategy that was taught, (c) guided practice during which the teacher prompted student responses, and (d) independent practice. The teacher and the observer ensured that all of these items were monitored in each lesson to ensure 100% instructional consistency. This suggested that the lessons were conducted as planned and matched the *Take Action* scripts.

## Social Validity

Because this study assessed how *Take Action* skills influenced English test scores, it was crucial to determine the social validity[6] of the after-lesson tests (i.e., the true/false, matching, and short answers tests). Before the study began, a focus group with special education background, including the English teacher, the teacher, and the researcher, assessed the social validity of each question of the *Take Action* tests. The questionnaire regarding social validity comprised three rating scales (i.e., 0 = delete, 1 = revise, and 2 = agree) to assess the focus group members' perceptions of each test. The focus group read the questions and determined the score.[7] If the average score of social validity was less than 14 or the range of the score was higher than 5,[8] the researcher called a focus group meeting to discuss and modify the questions to improve the social validity of the test content. Table 3 shows the overall scores of the tests, which indicated favorable social validity of each test.

## Maintenance

When the students satisfied the criteria of the *Take Action* Part III, which was 90% correct percentage in two successive tests, the intervention was stopped. When the instructions ended, the researcher recorded the students' *Take Action* scores and the English scores at the following second and fourth weeks to measure whether the participants could maintain the *Take Action* skills.

# Results

Figure 1 shows the *Take Action* and English scores of each student. Each graph indicates the student results of the *Take Action* knowledge (Part I, Part II, and Part III) acquisition and English scores across baseline, intervention, and maintenance.

Table 3　Scores of Social Validity for the tests

|  | True/False test | | Matching test | | Short answer test | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | L1 | L2 | L3 | L4 | L5 | L6 | L7 |
| English teacher | 18 | 20 | 16 | 18 | 17 | 18 | 20 |
| The teacher | 17 | 16 | 15 | 18 | 18 | 18 | 20 |
| Researcher | 20 | 18 | 18 | 16 | 16 | 18 | 18 |
| Average | 18.5 | 18 | 16.3 | 17.3 | 17 | 18 | 19.3 |
| Range | 3 | 4 | 3 | 2 | 2 | 0 | 2 |

* 0= delete; 1= revise; 2= agree

Two approaches were employed to examine the functional relationship between the *Take Action* knowledge acquisitions for all students (i.e., visual analysis and coefficient of correlation). First, in Figure 1,[9] according to the visual analysis, the baseline data of all four participants shows the tendency of being negative or approximating zero of the *Take Action* scores. The baseline of all of the participants did not exhibit increasing scores until they received the intervention. After the interventions, the *Take Action* scores of all four participants increased positively, indicating an overall trend of improvement achieved through the *Take Action* instruction. Finally, all of the participants maintained the *Take Action* skills for 2 separate weeks after the intervention was stopped.

According to Cooper, Heron, and Heward (2007), the definition of "functional relationship" ' involves a tendency difference under varying conditions. Therefore, the coefficient of correlation can be an indicator for the tendency differences in this study. The coefficients of correlation in baselines and interventions of all of the students were as follows: Amy (-0.86, 0.96), Bill (0, 0.35), Corey (-0.32, 0.32), and Evan (-0.76, 0.94; see R-values in Figure 1). The coefficients of correlation value differences between the base-line and intervention data suggested a functional relationship, which implicated the effectiveness of the *Take Action* instructions.

*Amy.* During the baseline phase, Amy's *Take Action* scores ranged from 50% to 60%, representing a descending trend (R = -0.86). Her English scores ranged from 60% to 70%, representing instability. During Part I, the *Take Action* scores remained stable at 70% for two successive sessions; however, the English scores represented a rapidly ascending trend, increasing from 60% to 80%. Although Amy's *Take Action* scores in Part II increased from 70% to 80%, her English scores decreased from 80% to 70%. In Part III, both Amy's *Take Action* and English scores increased from 87% to 100%, and 80% to 90%, respectively. Overall, the trend of the interventions indicated an increase (R' = 0.96). In the last session of Part III, Amy satisfied the criteria of the *Take Action* knowledge (two successive scores of 90%), and the intervention was stopped. After 1 week since the end of the intervention and during the mainte-nance phase, Amy's *Take Action* and English scores remained stable at 100% and 90%, respectively. However, her English scores decreased from 90% to 80% after another week of mainte-nance, whereas her *Take Action* scores remained at 100%.
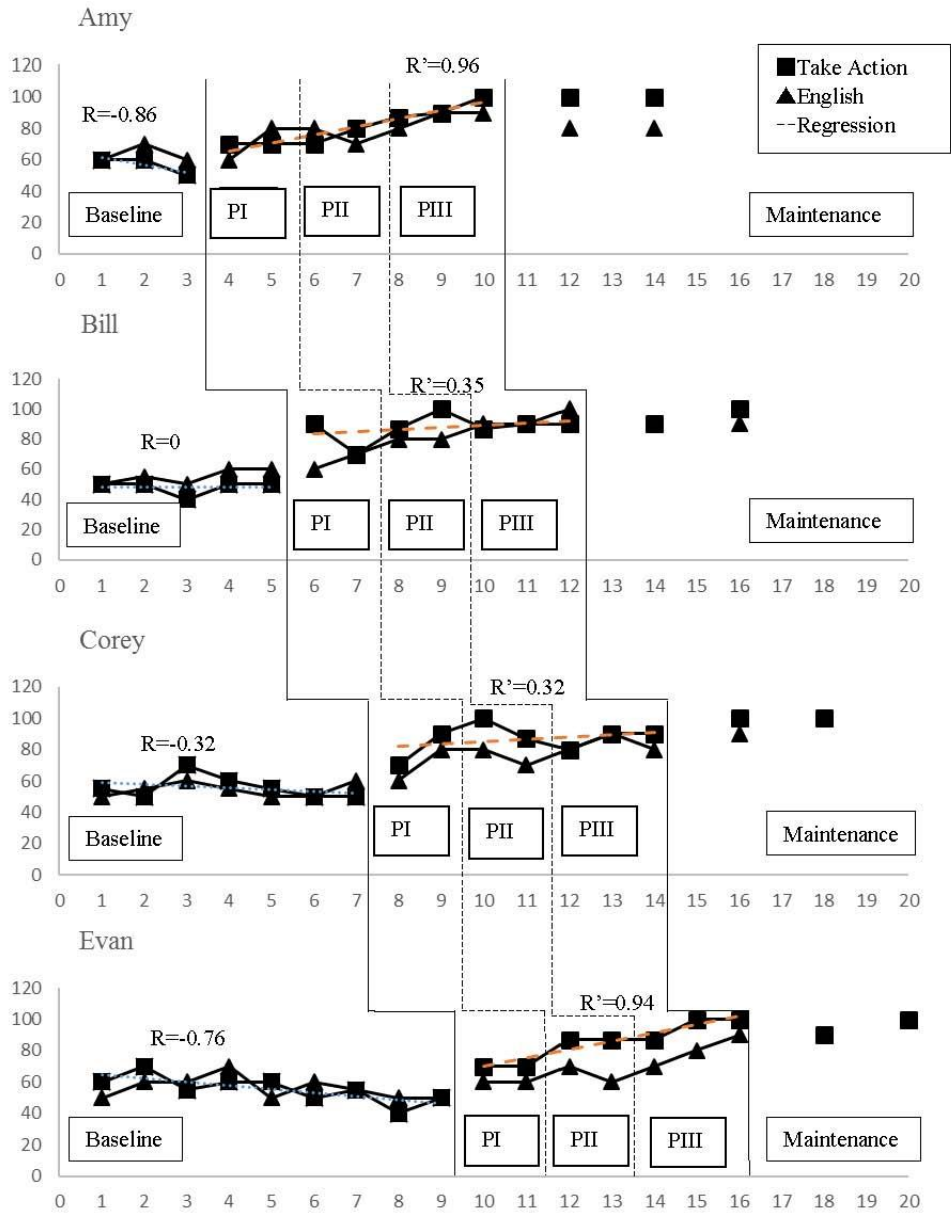
Figure 1　Take Action score results of Amy, Bill, Corey, and Evan (PI as Part I, PII as Part II, and PIII as Part III). R is the coefficient of correlation for the baseline, and R' is the coefficient of correlation of line for interventions.

*Bill.* During the baseline phase, Bill's performance regarding the *Take Action* was stable (R = 0) and ranged from 40% to 50%. His scores in the English test ranged from 50% to 60%. However, Bill's baseline data from the start of Amy's intervention date were stable constituting 50% in the fourth and 50% in the fifth session. The prediction of Bill's baseline was established while Amy received the intervention; Bill's performance remained unchanged and stable at the baseline, with 40% in both the fourth and fifth sessions. The Part I intervention started in the sixth session, and Bill's *Take Action* scores exhibited a high variability between 90% and 70%; his English scores exhibited an ascending trend (60% to 70%). In the Part II intervention, Bill's *Take Action* scores exhibited a rapidly ascending trend (87% to 100%). However, his English scores remained at 80% for two successive sessions. During the Part III intervention, both Bill's *Take Action* and English scores exhibited an ascending and stable trend. Overall, the trend of the interventions indicated an increase (R' = 0.35). Bill's *Take Action* scores ranged from 87% to 90%, and his English scores increased from 90% to 100%. After Bill received two successive scores of 90% in the final part of the intervention, the intervention was stopped, and the maintenance phase began. During the maintenance, Bill received *Take Action* scores of 90% 1 week after the intervention was stopped; his scores increased to 100% 3 weeks after the intervention was stopped. Bill's English scores were 90% 1 week after the intervention was stopped and remained at the same level until 3 weeks after the intervention was stopped.

*Corey.* Corey's *Take Action* scores during the baseline phase ranged from 50% to 70% and exhibited high variability in the first four sessions. His scores were not stable until the last three sessions of the baseline and then ranged from 50% to 55%. Overall, the trend of the baseline exhibited a decrease (R = -0.32). Corey's English scores (baseline data) ranged from 50% to 60%, which indicated more stable than the *Take Action* scores did. The prediction of Corey's baseline was established as Bill received the intervention, while Corey remained at an unchanged and stable baseline (40% in both the sixth and seventh sessions). During the Part I intervention, Corey's *Take Action* scores ranged from 70% to 90%, indicating a rapidly ascending trend. At the same time, Corey's English scores ranged from 60% to 80%, indicating a low and stable, ascending trend. In Part II, Corey's *Take Action* scores were initially 100% but soon dropped to 87%, indicating a descending trend. Moreover, Corey's English scores in this part indicated a slight decrease (80% to 70%). During Part III, Corey's *Take Action* scores ranged from 80% to 90%, indicating an ascending and stable trend. Overall, the trend of the interventions exhibited an increase (R' = 0.32). However, Corey's English initial scores were 80%, increased to 90%, but soon dropped to 80%. After Corey satisfied the criteria of the *Take Action* scores (two successive scores of 90%), the intervention was stopped. During the maintenance, Corey received scores of 100% in *Take Action* knowledge and 90% in English. After 3 weeks of intervention, Corey received both 100% in the *Take Action* knowledge and English scores.

*Evan.* Evan was the final student to receive the intervention. The prediction of Evan's baseline was established as Corey received the inter-

vention, while Evan remained at a stable baseline (30% and 40% in the eighth and ninth sessions, respectively). During the baseline phase, Evan received *Take Action* scores ranging from 40% to 70%, indicating a high variability in the first five sessions. Overall, the trend of the baseline exhibited a decrease (R = -0.76). Evan initially received scores of 60% in *Take Action* knowledge, but her scores soon increased to 70% in the second session; in the third session they dropped to 55%. After the fourth session, Evan exhibited more stable baseline data in *Take Action* knowledge, in which she initially scored 60% and then 40% in the eighth session. Although Evan's *Take Action* scores slightly increased from 40% to 50%, the overall baseline data from the fifth to the ninth sessions indicated more stability than did the first four sessions. However, Evan's English scores indicated instability in the first six sessions and ranged from 50% to 70%. Her English scores indicated more stability regarding the final three data sets of the baseline. During the Part I intervention, Evan received two successive scores of 70% in the *Take Action* knowledge and two successive scores of 60% in the English tests. During Part II, Evan's *Take Action* scores increased to 87% and remained at that level. However, she received a score of 70% in English, which soon dropped to 60%. In Part III, Evan's scores remained at 87% in *Take Action* knowledge, but soon the scores increased to 100% in two successive sessions. Overall, the trend of the interventions exhibited an increase (R' = 0.94). Evan's English scores exhibited a rapidly ascending trend (from 70% to 80% and 90%). Because Evan received two successive scores of 90% in *Take Action* knowledge, the intervention was stopped.

During maintenance, Evan received scores of 90% in *Take Action* knowledge and 90% in English. After 3 weeks since the end of the intervention, Evan's scores in *Take Action* knowledge and English increased to 100%.

## Feedback of the Take Action Instruction

After completing the *Take Action* lessons, the four students provided feedback on their progress regarding their English grades. They indicated that they received higher scores in English. The English scores of all four participants improved. The students indicated that they felt satisfied when they received higher scores in English; in addition, they felt more confident after learning how to make a plan for achieving their goals. The students indicated that they knew how to attain goals systematically and how to ask for help from friends by having participated in *Take Action* program. The most important goal of this program was to become self-determined. The students reported that the *Take Action* curriculum was an easy-to-use tool. They also stated that it would be more favorable to include this type of lesson at the beginning of a semester to help students with LDs succeed in school.

Although the English teacher was indirectly involved in the program, the English teacher saw the change in the students along with the implementation of the *Take Action* program. The English teacher indicated that the four students became more self-determined and self-managing in the English class; especially "the improvement of English scores helped them to believe in themselves." After the intervention,

the students demonstrated less problematic behaviors and more aggressive and dilligent learning than they did before the intervention.

# Discussion

This study examined the effects of the *Take Action* instruction on students' *Take Action* and English scores. The results of this study indicate that all four students exhibited *Take Action* skills after receiving the *Take Action* instruction, and all four students' English scores improved during receiving the *Take Action* instruction. A visual analysis (Figure 1) indicates a functional relationship among the *Take Action* scores and among the English scores before and after the *Take Action* instruction. All of the students except Amy received 90% or 100% in both the *Take Action* and English scores in the maintenance periods. Amy received a score of 80% in the second maintenance measurement. Therefore, the *Take Action* lesson package seems to enable young adolescents with LDs in high schools to learn and implement goal-attainment skills.

There is further evidence of the effects of the *Take Action* instruction on students' English scores. This study applied median difference (Cooper et al., 2007) to represent the effects of the *Take Action* instruction on students' English scores. Tables 4 to 7 show the median differences of the *Take Action* and English scores of the four students. The results indicate that almost all median differences of the English scores positively increased as the median differences of the *Take Action* scores increased. For example, the median differences of the *Take Action* scores of Amy ranged from 10 to 30; the median differences of Amy's English scores ranged from 10 to 30.

In addition, this study involved using the ratio of median differences to show the impact of the *Take Action* skills on the English scores. The ratio of the median difference is defined as the median difference of English scores of PIII minus the median difference of English scores of PI, divided by the median difference of *Take Action* scores of PIII, minus the median difference of *Take Action* scores of PI. Consequently, the four students exhibited the following ratios: Amy: 1 = (30%-10%)/(30%-10%); Bill: 2.5 = (35%-10%)/(40%-30%); Corey: 1 = (25%-15%)/(35%-25%); Evan: 2/3 = (25%-5%)/(45%-15%). The results of the ratios indicate that the *Take Action* skills influenced Bill's English scores the most and Evan's English scores the least.

Table 4　Median differences of Take Action score (%) and English score (%) of Amy

| Amy | Baseline | PI | Baseline | PII | Baseline | PIII |
|---|---|---|---|---|---|---|
| Take Action Median Score | 60 | 70 | 60 | 75 | 60 | 90 |
| Median difference | | 10 | | 15 | | 30 |
| English Median Score | 60 | 70 | 60 | 75 | 60 | 90 |
| Median difference | | 10 | | 15 | | 30 |

Table 5　Median differences of Take Action score (%) and English score (%) of Bill

| Bill | Baseline | PI | Baseline | PII | Baseline | PIII |
|---|---|---|---|---|---|---|
| Take Action Median Score | 50 | 80 | 50 | 93.5 | 50 | 90 |
| Median difference | | 30 | | 43.5 | | 40 |
| English Median Score | 55 | 65 | 55 | 80 | 55 | 90 |
| Median difference | | 10 | | 25 | | 35 |

Table 6　Median difference of Take Action score (%) and English score (%) of Corey

| Corey | Baseline | PI | Baseline | PII | Baseline | PIII |
|---|---|---|---|---|---|---|
| Take Action Median Score | 55 | 80 | 55 | 93.5 | 55 | 90 |
| Median difference | | 25 | | 38.5 | | 35 |
| English Median Score | 55 | 70 | 55 | 75 | 55 | 80 |
| Median difference | | 15 | | 20 | | 25 |

Table 7　Median difference of Take Action score (%) and English score (%) of Evan

| Evan | Baseline | PI | Baseline | PII | Baseline | PIII |
|---|---|---|---|---|---|---|
| Take Action Median Score | 55 | 70 | 55 | 87 | 55 | 100 |
| Median difference | | 15 | | 32 | | 45 |
| English Median Score | 55 | 60 | 55 | 65 | 55 | 80 |
| Median difference | | 5 | | 10 | | 25 |

Furthermore, the visual analysis reveals the same implications. During the Part I intervention, Corey's and Evan's English scores increased following the increased *Take Action* scores in Part I. However, Amy's English scores did not increase until the second intervention of Part I, while her *Take Action* score remained at 70%. However, Bill received successively increasing English scores through the Part I intervention, while the *Take Action* scores decreased from the first Part I intervention at the seventh session. The variations in Amy's and Bill's Part I intervention data may be attributable to different learning speeds and methods. The results of this study provide evidence that Amy and Bill required more time but ultimately achieved the goal. Of all four partici-

pants, Amy's scores exhibited the highest variation. Amy's English scores increased in Part I but soon decreased in Part II. Amy's *Take Action* scores did not exceed 80% until the second instruction of Part II, which explains the instability of Amy's English performance. After Part II intervention, Amy's English scores improved as the *Take Action* scores increased. Bill exhibited instability in *Take Action* skills in the Part I intervention, but his English scores increased in a stable manner between the Part I and Part III intervention as his Take Action scores increased. Although Bill's *Take Action* scores decreased from 100% to 87% in Part II and Part III, Bill's *Take Action* scores soon increased to 90%. Moreover, Bill's maintenance scores in both *Take Action* and

English were stable and exhibited an increase. Corey's and Evan's baseline data exhibited more variability than did those of the other two students. However, the English scores of both improved as their *Take Action* scores increased. Even though Corey's English score decreased at the end of the last intervention, it was still 90%.

The functional relationship results of this study were consistent with Cobb's (2009) meta-synthesized study in which it was indicated that numerous studies have implied the effectiveness of self-determination interventions. Although teaching self-determination skills to students with disabilities is crucial, few studies have focused on specific coursework (Mithaug et al., 2007; Pocock et al., 2002; Prater et al., 2014). For example, Serna's (1995) study involved teaching students self-determination skills to enable them to implement the acquired skills in their work places. Martin's (2003) study focused on teaching students' regulation and adjustment of their behaviors. Prater's (2014) study involved training students to become self-determined to improve their communication skills. However, for students with LDs, it is crucial to help them succeed in school. Therefore, the connection between self-determination skills and academic performance becomes significant for them. As the results show, the visual analysis reveals the functional relationship, which indicates the impacts of *Take Action* skills on students' English grades.

In Walden's (2002) study, students did not generalize the acquired skills across different time period, and this study shows that students can implement the learned skills in various environments. The possible reason for the success of this study may be due to the close connection of the *Take Action* program to the assigned goal, English-language ability. The clear objectives enabled students to become more task-focused when they were implementing the skills, which is consistent with Martin's (2003) study. Compared to Wehmeyer's (2013) self-determination study, which employed a quantitative research design to examine the effectiveness of self-determination skills, this study involved using a single-subject design to examine the effectiveness of self-determination in four participants. The usage of a single-subject design enabled observing each student's change of self-determination knowledge acquisition and implementation process within the subject, which is more clear and in-depth. However, more single-subject studies are necessary in at least three distinct locations, and 20 participants are required to determine the effectiveness of the *Take Action* lessons (Horner et al., 2005).

## Conclusion

This evidence of the effectiveness of the *Take Action* program for students with LDs suggests that the students in this study learned more than merely setting goals. After participating in the *Take Action* program, the students reported enhanced responsibility and an improved ability to organize their work. The four students learned how to set realistic goals, as well as make, enact, evaluate, and adjust their plans. The knowledge base established through the course was evident through observations by the teacher and continued to positively affect the students' academic performance long after completing the program. The test results indicate merely a part of student performance. The data does not include information

about performance including goal accomplish-ment, learning attitude, and responsibilities. All four students accomplished their short-term objec-tives. To accomplish goals, students with LDs have to learn to be responsible to organize plans as well as to engage in acting out. After finishing all of the lessons, the teacher participating in this study felt that the *Take Action* lesson package was efficient and simple to use. The students enjoyed using the skills to accomplish personal or academ-ic goals and recorded goal accomplishments in their own journals.

Based on visual analysis, correlation coeffi-cient, and median differences, the results show the functional relationship between the *Take Action* instruction and the *Take Action* and English scores. All four students with LDs improved their English scores while they participated in the *Take Action* lessons. Besides, students with LDs need lessons that are easy to understand and follow. To achieve this goal, teachers must develop effective instruction including additional activities, tracking forms, and support. Activities such as matching cards, presentations, and class projects enhance students' motivation and application of learning. This study suggests that teachers should use the *Take Action* lesson package to facilitate students' daily IEP goal-attainment. Teachers must design activities based on students' needs to enable them to understand the concept of a certain lesson package and engage with the program.

1 The terms of "Single-Case design" and "Single-Subject design" are synonymous in the research field. In this paper, "Single-Case design is used

2 Unless stated otherwise, "the teacher" refers to a teacher who taught the Take Action package.

3 The six questions are referred to as "six plan parts" in this paper.

4 Take Action knowledge score

5 English score

6 The definition of *Social Validity* is a term coined by behavior analysts to refer the social importance and acceptability of treatment goals, procedures, and out-comes. (Foster and Mash, 1999)

7 Because each test comprised 10 questions, the lowest score was zero and the highest was 20.

8 Based on our research, no suggestions are available regarding the values for the average and range.

9 In Figure 1, PI infers to Part I, PII infers to Part II, and PIII infers to Part III.

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# 目標導向教學對於學習障礙學生英文成績之影響：單一受試者研究以美國為例

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在美國，中學學障生通常成績表現不佳，學者專家透過不同策略與工具致力於減緩學障生學習困難。自我決策技能被建議為增加學障生達成其學業、行為與工作表現有效的介入方法，但鮮少有研究能透過教學現場觀察，有效的提出自我決策直接的實證。本研究運用單一受試者方法使用「行動課程」促進學生有效使用自我決策技能，主要目的在檢視個別學障生在目標達成方面的知能以及「行動課程」的教學對於其英文成績的影響。四位在英文資源班的高中學障生個別接受大約 200 個小時的「行動課程」。本文作者使用多基線跨受試者設計方法收集輔導教室中學生們在「行動課程」之前及之後個別的「行動課程」知能成績以及英文成績，比較每位學生在基線及介入後的相關係數及中位數差異比。結果顯示每位學生介入後的相關係數都比介入前基線的相關係數大，個別學生的英文成績及「行動課程」成績的中位數差異比顯示出學生英文成績是隨著「行動課程」成績的進步而增進，即顯示「行動課程」與英文成績間的功能性關係。總結本研究可得（一）學習自我決策技能可以協助學障生促進其學業表現；（二）學障生能夠主動實施「行動課程」；（三）學生學習「行動課程」後，對於自己的學校工作較有責任感；（四）老師覺得「行動課程」是有效且使用簡單的。然而，配合使用一些活動以提升學生學習動機和應用也是很重要的。最後，這個研究建議老師應該配合學生 IEP 目標使用這個課程。

關鍵字：學習障礙、自我決策、以目標為導向、單一受試者研究