UNIVERSAL DESIGN FOR TRANSITION: A SINGLE SUBJECT RESEARCH STUDY ON THE IMPACT OF UDT ON STUDENT ACHIEVEMENT, ENGAGEMENT AND INTEREST

By

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ABSTRACT

Universal design for transition (UDT) refers to an approach to instructional planning, delivery, and assessment that bridges the gap between teaching academic and functional/transition goals. It builds upon the principals of universal design for learning (UDL) assuring that instructional practices are designed to meet the needs of diverse learners through the use of multiple means of engagement, expression, and representation. UDT assures that instruction includes multiple transition domains, multiple transition assessment, multiple resources/perspectives and student self-determination to support academic achievement and the transition to adult life. The purpose of this study was to determine whether the use of a UDT approach to instructional design and delivery had the results predicted when used in a high school social studies class. A single subject multiple-treatment design was used to determine the impact of each instructional approach. Quantitative data was gathered through observation and survey of 6 students at the secondary-education level. The findings indicated that students with disabilities were more interested and engaged and had better academic achievement when a UDT approach was used compared to the other two approaches. Implications for UDT being an effective evidence-based approach to instruction and assessment, as well as future research on UDT are presented.
Keywords: Universal Design for Transition, Universal Design for Learning, Student Achievement, Student Engagement, Student Interest, Transition Services, Self-Determination, Multi-Element Brief Experimental Design.

INTRODUCTION

The passage of the No Child Left Behind Act (NCLB) of 2001 (PL 107-110) and the Individuals with Disabilities Education Improvement Act (IDEA) of 2004 (PL 108-446) have introduced a shift in the focus of much of the educational supports and services provided to students with disabilities, requiring that supports and services be based on providing access to the general education curriculum and that high standards be held for all. Wehmeyer (2006) pointed out that this change required new approaches to instructional planning, delivery, and assessment, and new applications for approaches and strategies that would address the needs of students with a range of abilities and learning challenges. It is equally important to remember that the changes to increase the academic rigor of instruction provided to students with disabilities did not eliminate the need to prepare students with disabilities for their adult lives; the requirement that individualized education programs for high school students include transition services remained relatively unchanged. These individualized education and transition goals can and should include a range of adult life domains including employment, post-secondary education, community living, transportation, recreation and leisure, and health care (Thoma, Bartholomew, & Scott, 2009).

The Individuals with Disabilities Education Improvement Act of 2004 (IDEA 2004; PL 108-446) lists specific requirements for transition planning and services. The

term transition services refers to a coordinated set of activities for a child with a disability that

- Is designed to be within a results-oriented process that is focused on improving the academic and functional achievement of the child with a disability to facilitate the child's movement from school to post-school activities, including postsecondary education, vocational education, integrated employment (including supported employment); continuing and adult education, adult services, independent living, or community participation;
- Is based on the individual child's needs, taking into account the child's strengths, preferences, and interests; and
- Includes instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and, if appropriate, acquisition of daily living skills and functional vocational evaluation. [34 CFR 300.43 (a)] [20 U.S.C. 1401(34)].

Secondary special education teachers are faced with the task of meeting the individual transition needs of students with disabilities that are specified under IDEA, while continuing to access and/or meet the academic standards outlined for all students. Standard based academic reform and transition reform are grounded in different policies and can create a challenge for teachers when trying to meet the requirements of both academics and transition services. IDEA continues to regulate the individual planning of services for students with disabilities; whereas, NCLB supports standardization within academic objectives to improve student outcomes. The responsibilities between laws means that teachers must prepare students for employment, community experiences, and independent living while still teaching algebra, social studies, science and english. These can seem like competing and disconnected requirements to teachers and students alike.

Further, NCLB requires that standardized assessments be given to measure student educational outcomes based on uniform objectives. However, education and transition outcomes may differ for students with disabilities. Outcomes for students with disabilities are based on their completion of individual goals stated in their IEP and may include their level of self-determination and functional skills in employment and/or social situations. An initial investigation into the current programs of study for students with disabilities demonstrates that most students do not have both academic and transition types of goals (Thoma, Pannozzo, & Achola, in production). Their secondary analysis of the data collected through the National Longitudinal Transition Survey-2 found that students with more significant disabilities have annual goals that are tied more directly to transition planning and less related to the rigorous academic content of the general education curriculum. Conversely, students with less intense support needs (i.e. those with high incidence disabilities such as learning disabilities, emotional disturbance, and/or communication disorders) are more likely to have annual goals that are focused on academic achievement, with few transition type goals. Yet the requirements of NCLB and IDEA recognized that all students are best prepared for adult lives when they have a solid academic foundation and they exit high school with an understanding of and plan for their lives in multiple domains.

Both NCLB and IDEA support access to high standards for all students, yet ambiguity exists in defining the high standards that students should achieve. This is especially true in the secondary curriculum where the discrepancies among students' abilities may be more apparent as they access more difficult and complex academic concepts. High standards are not isolated in the academic curricula, but should extend to concepts and experiences that are imperative to transitioning from high school to adult life. Therefore, it is important that innovative curricula be designed that facilitates access to general education and both includes multiple-outcome measures and learning supports, and combines both transition and academic standards (Kochhar-Bryant & Bassett, 2002).

Universal Design for Transition

Thoma, Bartholomew, & Scott (2009) proposed a new strategy to help teachers and educational planners meet the goals of linking academic content to transition planning and individualized instruction and goals through

the implementation of what they call Universal Design for Transition (UDT). UDT is designed to provide a framework for special education teachers, transition specialists, and administrators who want to revise instructional design and delivery so that they not only meet the required academic standards, but also better prepare students with disabilities for a successful transition to adult life. UDT was also designed to be useful for general education teachers who are looking for a way to teach academic standards in a manner that it is more functional and could link those standards with the individualized goals and transition planning needs of students with and without disabilities who may learn in different ways.

Universal design for transition builds upon the concept of universal design for learning UDL (CAST, 1998), which is an instructional framework designed to meet the academic needs of students with and without disabilities. UDL is designed to remove barriers to learning for all students and is based on the assumption that all students can learn (Wehman, 2006). Many studies have demonstrated the impact of the use of a UDL approach to instructional planning, delivery and assessment (e.g. Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008; Kortering, McClannon, & Braziel, 2008; Meo, 2008; and Strangman, Meyer, Hall, & Proctor, 2008) and its impact on increasing student engagement in instruction (e.g. Rose & Meyer, 2002). UDL has three essential components to its framework for meeting the academic needs of all students: (i) multiple means of engagement, (ii) multiple means of expression, and (iii) multiple means of representation, which educators must focus on to effectively use this approach. UDT extends the UDL approach to instructional planning and academic needs, by adding transition domains to the list of essential components required to meet not only the academic standards (UDL) but to also link those standards to transition domains (UDT).

Thoma, Bartholomew, & Scott (2009) added four additional components to the UDL approach: (i) multiple transition domains, (ii) multiple transition assessments, (iii) self-determination, and (iv) multiple resources/participants. These additional components are based on evidence-based practices in secondary education/transition strategies that have demonstrated their impact on preparing students for lives after high school (Test, Fowler, Richter, White, Mazzotti, Walker, Kohler, & Kortering, 2009). Their premise is that the addition of these components to instructional planning will not only improve student academic performance and engagement (as has been the case with UDL), but also transition outcomes and student interest/motivation in participating in the lessons (Thoma, Bartholomew & Scott, 2009). The four additional components to the UDL approach that demonstrates an UDT approach are described as:

Multiple Transition Domains

This is focusing on helping students develop skills that can be used in a range of different adult settings. Teachers should think beyond preparing students for a transition to employment, but should also include the transition to post-secondary education and involvement/participation in recreation/leisure, community, daily life, transportation, healthcare services.

Multiple Transition Assessments

Assessment of student progress should also include strategies that will provide needed information for transition IEP teams to make informed decisions about transition outcomes and annual goals that will lead the student toward meeting those outcomes. A range of assessment strategies should be used, including informal, and alternative, and performance-based assessments.

Self-determination

Students need to be active participants in educational planning, instructional delivery and assessment of progress. Increasing student self-determination includes a range of options such as student direction of their individual education program planning, use of strategies such as the self-determined learning model of instruction, and assessment strategies such as self-evaluation and self-monitoring.

Multiple Resources/Perspectives

To assure that educational planning teams and teachers are able to successfully combine all these components,

they need to expand the expertise and resources that they use for educational planning, delivery and assessment. No one person or IEP team can be expected to know all the possible skills that might be needed to succeed as an adult. Therefore, it is important to bring a range of people into the process beyond those who traditionally have been part of educational planning teams.

Applying the UDT process requires teachers to link the four additional components into their UDL approach to classroom instruction. Although the concept of UDT holds promise for both academic achievement and student engagement and interest, this new concept has not been validated through any empirical research study. The purpose of this study was to determine whether the use of a UDT approach has a positive impact on student academic achievement, engagement and interest that would be similar to the impact of a UDL approach in teaching academic content, particularly for students with disabilities who have both academic and transition goals in their IEP plans.

Methodology

Research Design

This study used an ABAC multiple-treatment design (Richards, Taylor, Ramasany, Richards, 1999; Kennedy, 2005) which involves the application of 2 or more treatments within a single subject. The ABAC multiple-treatment design can be used to compare the effects of 2 or more interventions (UDL and UDT), where A refers to baseline conditions and B and C represented intervention conditions. The primary strengths of a study that uses an ABAC multiple-treatment design is that it can compare treatments within a short time frame and treatments may continue even when baseline data is not relatively stable, without validity being compromised (Kazdin, 1982; Richards et al., 1999). Multiple-treatment designs provide guidance to determine whether there is sufficient promise in the research to warrant a more lengthy study and are especially valuable for applied research.

Setting

This study took place in an exceptional education classroom in a large suburban school district in the southeastern United States. The class consisted of eleven students; one certified teacher, and three paraprofessionals. Students in this classroom receive instruction in a self-contained setting. All students are enrolled in general education electives for special activities, including music, physical education, art, computer technology, and/or Junior Reserves Officers' Training Corp (JROTC). The school district gave permission for this study to take place.

Participants

Cooperating students and parents granted informed consent for their participation in the study. Six of the eleven students in the classroom chose to participate in the study. Students who did not give consent or whose parents did not provide consent participated in the lesson but their assessment, engagement and interest data was not collected and included in this study. The participants included six secondary education-level students who were members of a self-contained secondary special education classroom for social studies academic instruction. This classroom was in a large suburban high school in a school district in the Southeast. Student characteristics reflected a range of disability, age, gender, ethnicity, and grade. Table 1 depicts student participants by age, grade, ethnicity, disability, and typical achievement in this particular classroom.

Data Collection Procedures and Data Analysis

An ABAC multiple-treatment design (Richards, Taylor, Ramasany, Richards, 1999) was used to investigate the effects of a UDT approach on student academic achievement, engagement and interest in a secondary education social studies special education classroom. The classroom teacher prepared a unit plan that consisted of four different lessons, all which covered the same topic in the secondary social studies curriculum (modern U.S. history: 1950's – present day). Each lesson was 90 minutes in length and each lesson, along with the data, was conducted during the scheduled time each day. Student achievement was measured at the end of the lesson, as was the assessment of student interest in the

lesson. Student engagement was measured at a consistent point during each lesson. The classroom teacher (and fourth author) was responsible for collecting the data in each phase of the study.

Baseline

The baseline condition for this study used traditional methods for instructional planning and delivery. The teacher used direct instructional practices or traditional strategies and methods (use of text, lecture, and paper and pencil assessments) to deliver instruction to students. The teacher conducted the lesson by orally leading students through the lesson, allowing students to engage in questioning, brainstorming, and answering techniques at regular intervals throughout the lesson. In addition, after each slide the teacher instructed students to use a guided worksheet to answer questions about the materials they have covered. Students' performance on the lesson was assessed through their grades on the worksheet.

Intervention

The second lesson, after the baseline phase, was developed to reflect a UDL approach to instructional delivery and assessment (multiple means of engagement, representation and expression) and served as the Intervention I phase. The teacher had students work in groups, rather than individually. Technology was incorporated into lesson planning and delivery through the use of powerpoint slides with audio and video to enhance the representation of the instructional information. Students engaged in learning through auditory, visual and hands-on activities. Students demonstrated their academic achievement through the use of a computer-based assessment which provided multiple ways for students to input their answers into the assessment program (that is, voice input, touch screen, alternative keyboard).

Student	Age	Gender	Ethnicity	Grade	Disability/ IQ Score	Typical Achievement
Student 1, Rhonda	18	Female	Caucasian	11	Intellectual Disability/IQ 68	Inconsistent motivation for learning and performance; achieves average success (C to B); student has needed a range of motivational prompts to perform at her potential.
Student 2, Shawn	17	Male	African American	11	Intellectual Disability/ IQ 68	Above average achievement; motivation and performance have been linked to interest in topic.
Student 4, Elena	15	Female	Hispanic/ Latino	9	Intellectual Disability/IQ 68	Average level of achievement (C average); verbally active in classroom activities
Student 4, Ron	17	Male	African American	11	Learning Disability/IQ 72	Above average levels of achievement when intrinsically motivated; asks for breaks when feeling discomfort or uninterested in topic
Student 5, Mike	19	Male	Other	11	Multiple Disability/IQ 64	Average achievement level (C average); often needs verbal prompts to remain on task
Student 6, Richard	17	Male	Caucasian	11	Intellectual Disability/IQ 67	Achievement levels are below average/failing (F average)

Table 1. Student Demographic

Baseline

The third lesson returned to baseline conditions. In this phase, the same traditional teaching strategies and methods as the first lesson were used. The traditional methods and strategies using text, lecture, and paper/pencil assessments was utilized to deliver instruction.

Intervention

The fourth and final lesson employed a UDT strategy (UDL components, as described in Intervention I, combined with multiple transition domains, multiple transition assessments, self-determination and multiple resources/perspectives, and served as the Intervention II phase). The information taught in this lesson was tied to skills students would need to use in their adult world; they used the self-determined learning model of instruction (Mithaug, Wehmeyer, Agran, Martin, & Palmer, 1998) to set their own goals for learning and to determine how to link the instruction to their own long-term goals; and additional resources were brought in from the community to demonstrate the concept being taught. Assessment was conducted using a computer program (similar to intervention I) which provided multiple means of input for the student, but it also required that students apply the information learned to a real world authentic task which not only provided an assessment of student academic

Component	Intervention I UDL Components of Intervention I and II	Intervention II UDT Components (UDL + transition)
1. Multiple means of representation What are the various ways presented that will help the learner acquire the information?	1. Lecture material was shared auditorily (teacher's lecture), visually (use of powerpoint which was displayed on classroom video monitors and in handouts that students could use to for guided notetaking). Students were able to access the powerpoint slides on their own laptop computers and each slide included the pre - recorded part of the lecture.	
2. Multiple means of expression What alternatives are provided to help the learners demonstrate what they know?	2. Students demonstrated what they learned through completion of a computerized assessment that provided multiple means of input (voice input, touch screen, or alternative keyboard).	
3. Multiple means of engagement What elements of the lesson will help focus learner's interest? UDT	3. Use of computers for both the lesson delivery and assessment increased student interest in the lesson. Students worked in groups to help each other understand the material and to work on group research to identify the impact of various events and people on the world.	
4. Multiple transition domains What elements of the lesson will help students prepare for their adult lives?	4. N/A	4. Teacher identified links to real world activities and experiences of work, community living, and post - secondary education. For example, students learned about the events of September 11, 2001 and their impact on transportation, employment opportunities (both gained and lost), communities and people of different ages. Students had the opportunity to search the internet to find real world examples to share with the class.
5. Multiple transition assessments What instruction, supports, or services where used/assessed to help students achieve life - long goals?	5. N/A	5. Student's assessments included real world application of what they learned. Students projects used technology, oral presentation skills, and collaborative work, all skills that are linked to success in life.
6. Self - determination What voice did the student have in the process?	6. NA	6. Student groups used the self - determined learning model of instruction to organize their work. This strategy teaches problem - solving, goal setting, and self - assessment skills.
7. Multiple resources/perspectives Were there resources or perspectives beyond the classroom included in the planning process?	7. N/A	7. Community, school, and family members contributed to telling stories and facts for the lesson. Students accessed internet resources, multi - media products, books, magazines, and audio tapes to enhance their learning.

Table 2. Examples and Strategies Used in the lessons for UDL and UDT

achievement, but also provided transition assessment information that could be used to target transition goals and/or needs for further instruction. A list of the specific examples of the UDL and UDT components used in these interventions are described in greater detail in Table 2.

Data Analysis

A likert-like scale was used to assess the level of student engagement at 20 minutes into each lesson, from not engaged through very engaged. Points were assigned for each level of engagement, from 0 points for not engaged through 4 points for very engaged. The classroom teacher collected this data during each lesson and the first author of this study conducted the inter-observer reliability checks for three of the four lessons. Table 3 shows the rubric used to collect data regarding student engagement.

Student academic achievement was measured at the end of the lesson. For the two baseline conditions, student performance on a worksheet that included 10 questions based on the state standards being addressed by the lesson was used. That score was converted to a 5 point scale for grading purposes (0.5 points per question). The assessment of student achievement in the two intervention stages were alternative assessments that provided multiple opportunities for students to demonstrate their understanding of the material being taught. For the UDL lesson plan, a computer-based assessment was used that provided an opportunity for students to use multiple input strategies (voice input, touch screen, and/or alternative keyboards). For the UDT lesson plan, a computer-based assessment was also used with the same options for multiple input strategies. The assessment activity was an application of the information they learned in the lesson, providing a link to real world activities.

The level of student interest in the lesson was measured at the end of the lesson. This data was collected through

Engaged (1 point)	Average Engagement (2 points)	More than usually engaged (3 points)	Very engaged (4 points)	Not engaged (0)
Student just followed teachers directions for assignment. Student did not increase nor decrease active learning based on their individual strengths, weaknesses, needs, and preferences.	Student exhibited moderate active participation based on their individual strengths, weaknesses, needs, and preferences.	Student made noticeable improvement with active learning skills, attention, communication (ex: eye contact), and willingness to be involved in the lesson, based on their individual strengths, weaknesses, needs, and preferences.	Student demonstrated significant interest in participating in the lesson through active learning, communication, willingness to be involved in lesson, attention, desire to participate, and willingness to be successful, based on their individual strengths, weaknesses, needs, and preferences.	Student was not involved in the activities of the lesson and/or there was a significant decrease in typical degree of engagement in lesson.

Table 3. Level of Engagement Indicators

student self-report on a short three question survey. The survey asked three different questions and students rated the lesson on a scale of 0 to 4. These questions were as follows:

- Did you understand the lesson?
- Were you interested in this lesson? That is, did you enjoy the lesson?
- Will you be able to use what you learned in this lesson in your life?

The classroom teacher asked students to complete this brief survey after each lesson and collected them. Both the teacher and the primary author reviewed student survey data and summarized the data.

Interrater Agreement

Interrater agreement data were collected across approximately 75% of the sessions by the lead researcher. A point-by-point comparison was used to calculate inter-rater agreement throughout the study. Agreement was calculated by the number of agreements divided by the number of agreements plus disagreements multiplied by 100 (Kazdin, 1982). The range was 82-100% with a mean of 96% across all experimental conditions for both student engagement and achievement. Student achievement data had a higher inter-rater agreement range (95-100%) and mean (98%) than student engagement data (range: 82-98% and mean: 94%). There was 100% inter-rater agreement for data related to student interest in the four different lessons.

Results

Results for an ABAC multiple-treatment design is presented for each student and represented graphically. This section will describe the data for each student of their achievement and engagement as well as their perceptions of level of understanding, interest/enjoyment in the lesson and the ability to use the knowledge in everyday life in each of the four conditions: baseline (A), intervention I (B), baseline 2 (A) and intervention II (c).

Student 1, is a female student with intellectual disability whose motivation and engagement in instruction is inconsistent over time. Her level of engagement in the first baseline phase was rated at a 1 (minimally engaged) and her performance on the lesson was average (4/5 points or 80%) as measured by her performance on the worksheet. She reported that she had an average level of understanding of the lesson, but minimal enjoyment/interest in it and saw little relationship to her future life. During Intervention I (or UDL), there was an increase in her academic performance and engagement. She also reported greater interest in the lesson and reported that she saw some connection between the lesson and her everyday life. Her perception of her understanding of the lesson did not change from the baseline phase. The other ratings went down in the second baseline phase (achievement, engagement, interest and perception of usefulness of lesson to everyday life). In the last phase, intervention II or the UDT condition, achievement increased as did engagement, interest and perception of the usefulness of the lesson to everyday life. Figure 1 shows the graphic representation of this data.

Student 2, is a male student with intellectual disability who is an average performer in the social studies class. He is motivated to learn and is typically engaged in the activities of most lessons. He does not typically enjoy the class, however. This is reflected in the very low scores for interest/enjoyment of the lesson (starting at 0 at baseline, increasing to 1 for the intervention I phase, returning to 0 for the second baseline phase, and then returning to 1 for Intervention II). Yet even with this lack of

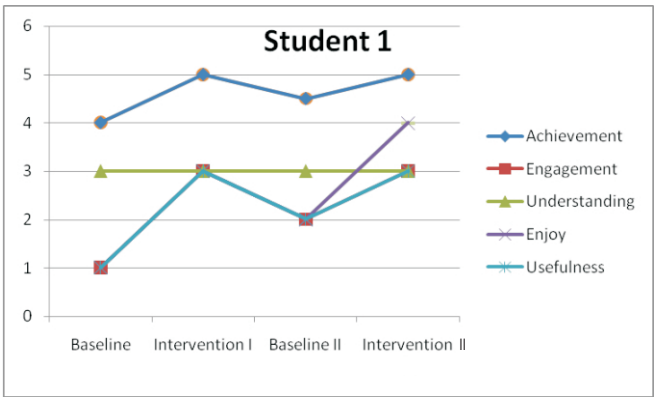

Figure 1. Student 1 Data

interest/enjoyment, student 2 made gains in academic achievement during the Intervention I and Intervention II phases compared to baseline and his levels of engagement also increased. His perception of his own understanding of the material increased after the first baseline and then remained stable. His perception of his ability to use the information in his adult life increased during Intervention I and II phases, returning to the same levels in each of the baseline phases. Figure 2 shows the graphic representation of this data.

Student 3, is a female student with intellectual disability who is an above average performer in the classroom but who is typically very engaged in the activities of the classroom. Her data over these sessions reflect that level of engagement in the lessons. It started out higher than students 1 or 2, but remained constant. Her engagement did increase, with the Intervention II phase. Her achievement in the class started out strong in the initial baseline phase, decreased during intervention I and then returned to the level of the first baseline (5/5 points) in baseline 2 and Intervention II phases. Student's perception of her own level of understanding of the lesson remained consistent through the baseline, intervention I and baseline 2 phases, but increased in the Intervention II phase. The perception of her ability to use what she learned in the future started high, decreased in the Intervention I phase, then increased in each of baseline 2 and Intervention II phases (when it returned to the original rating of 4). Her self-report of her interest/enjoyment in the activity was low in each of the baseline phases and increased in each of the intervention phases with the higher rating during Intervention II. Figure 3 shows the graphic representation of student 3's data.

Student 4, is a male student with a learning disability who is an above average performer in this social studies class. He is engaged or interested in lessons if he enjoys the content or if he is able to see a rationale for why he should learn the material. He is highly influenced by others around him. He started the baseline phase with an average performance on his worksheet (4/5 points), low engagement level, low interest/enjoyment of the lesson and a low perception of his ability to use the information in his life. All of these measures increased with the Intervention I phase except for the level of interest/enjoyment which remained consistent through this and the second baseline phase. Interest/enjoyment only increased in the Intervention II phase, from a rating of 1 to the highest, 4. The perception of understanding of the lesson was consistent through the two baseline and Intervention I phases (3/4 points), increasing to a much lower than his achievement would indicate. He rated his

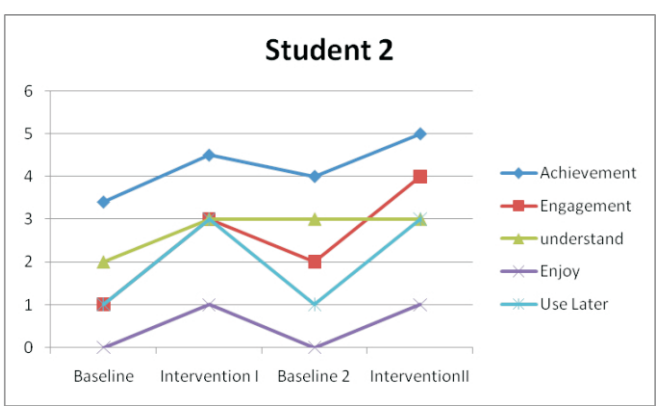

Figure 2. Student 2 Data

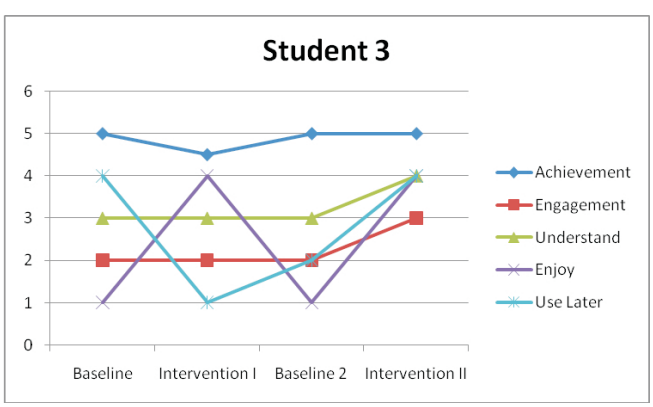

Figure 3. Student 3 Data

understanding as a 4 during the Intervention II phase up from a 3 in each of the earlier three phases. Figure 4 shows the graphic representation of student 4's data.

Student 5, is a male student with multiple disabilities who performs in the average range in the social studies class and his engagement in lessons is inconsistent. Data collected related to his achievement, engagement and interest/enjoyment are consistent with his past performance in academic classes. While his achievement is acceptable (4 or 4.5 in baseline and/or intervention I phases), he is not actively engaged in the lesson nor does he report a high level of interest/enjoyment in the activities of either the baseline or intervention I phases. He also does not report that he has a high degree of understanding of the lesson during the baseline or intervention phases. His data changes consistently in the Intervention II phase, where achievement, engagement, interest, and understanding all increase compared to any of the earlier phases. His ratings of enjoyment level and perception that the information will be useful to him in everyday life follow a similar pattern in all four phases with ratings of 1, 3, 2 and 3. Figure 5 shows the graphic representation of Student 5's data.

Student 6, is a male with intellectual disability who typically receives grades of below average in this social studies class. He requires frequent prompts to stay engaged in the lesson and at times engages in challenging behavior in an attempt to escape the demands of his assignments. Although describing student's behaviors when not actively

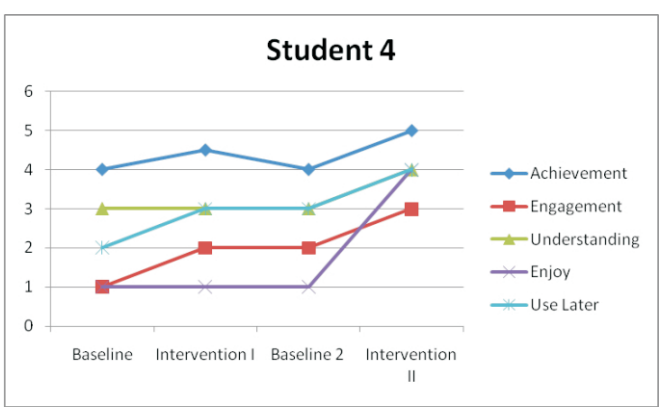

Figure 4. Student 4 Data

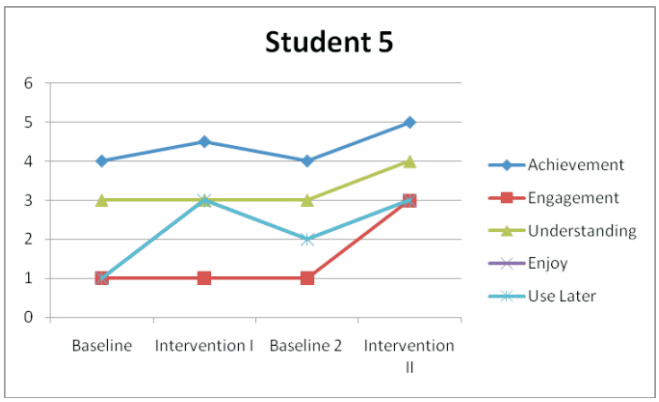

Figure 5. Student 5 Data

engaged in a lesson was not part of the data collection procedures of this study, it was anecdotally noted that his challenging behaviors continued to be a problem during the baseline and intervention I phases. While he perceived level of understanding of the content presented in the lesson remained constant at 3/4 points, his achievement on the end of lesson assessment increased in both intervention phases compared to the baseline phases (3/5 points, increasing to 4.5/5 in Intervention I phase, dropping to 3.5/5.0 in baseline 2 phase, and rising to 5/5 points in the Intervention II phase). Student 6 engagement data showed similar improvement increasing from a rating of 0 in the first baseline phase to 1 in Intervention I, returning to 0 in Baseline 2 and increasing to 2 in the Intervention II condition. His perception of interest in the lesson remained steadily low at 1/4 possible points, but his perception that the information learned would be useful to him in his adult life increased from 1 point at baseline to 3 during intervention I, decreased to 2 in baseline 2 and increased to 4/4 points in Intervention II. Figure 6 shows the graphic representation of Student 6's data.

Discussion

Bridging the gap between academic standards and transition and individualized instructional planning for students with disabilities has materialized as an essential theme of recent legislation and policy (e.g., IDEA and NCLB). Educators are challenged to think creatively when engaging students with meeting academic standards and preparing their students for a successful adult life. Recognizing this need, this study examined a UDT

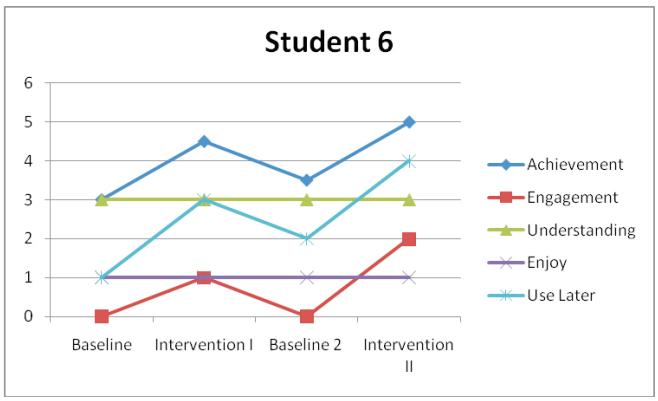

Figure 6. Student 6 Data

approach (Thoma, Bartholomew, & Scott, 2009) to instructional planning that seeks to bridge the gap between academic and transition goals. In this study, the same protocol was used to teach a unit plan focusing on U.S. modern history (1950's to present time) through a series of four lessons. The first lesson used traditional teaching strategies of lecture, questioning and assessments through completion of written worksheets. The second lesson incorporated elements of a universal design for learning approach (CAST, 1998). The third lesson returned to a baseline condition while the final lesson used a universal design for transition approach (Thoma, Bartholomew & Scott, 2009).

The data collected as part of this study appears to support the hypothesis that combining a UDL approach with elements of effective transition education to teach academic content will result in improvement in student engagement and interest in lessons and ultimately in student academic achievement. We found that students reported greater interest and engagement in lessons designed and delivered using a UDL approach and even greater interest and engagement in the UDT lessons. This was true for students who were both high achievers as well as those who struggle with learning academic content. It was true for students who struggled with staying focused on their lessons as well as those who were typically highly engaged in lessons. Lastly, it was true for students who saw the relevance in what they were learning and for those who did not.

Limitations

One of the clear advantages for using a multiple treatment design is the ability to evaluate more than one treatment with the reintroduction of baseline conditions, without validity being compromised (Richard, Taylor, Ramasamay, & Richards, 1998). However, whenever more than one treatment is provided in sequence to the same subjects, there exists the possibility of "multiple-treatment interference," or one treatment influencing the other (Kazdin, 1982). When this interference occurs, it may be difficult for the researchers to draw clear conclusions about each treatment. This interference can happen due to the sequence in which the treatments are administered. Although one must be concerned about the possibility of multiple-treatment interferences, in multiple-treatment designs, interventions are considered separate phases which minimizes the risk of influence. While this study attempted to minimize this risk by increasing the percentage of inter-rater reliability checks, additional research is needed to identify and examine this topic using a broader method to minimize risks.

Conclusion

The outcomes of this study support the original hypothesis that a UDT approach enhances the positive impact of a UDL approach. While the results of one study cannot determine that UDT is definitely the cause of the increase in student achievement, engagement and interest in their lessons, it does provide a strong rationale for additional research. This research should include a qualitative study that attempts to understand the interconnectedness between the different components of a UDT approach. Such a methodological approach to research would also provide insight into the different ways that a UDT approach could be applied to instructional planning, delivery and assessment. In addition, further single-subject methodological studies should also be conducted, using methods that include data collection over time in each condition to further determine internal validity of the study. As this line of research continues to evolve, we are hopeful that secondary educators and stakeholders will be responsive to the opportunities to improve student outcomes through effective approaches like UDT.

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