Universal Design for Learning in Inclusive Classrooms

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ABSTRACT

The authors of this paper describe how teams of preservice and inservice special and general education teachers implemented universal design for learning (UDL) in inclusive classrooms. An examination of the teachers' perceptions concerning UDL contributed to understanding how the general education curriculum can be adapted for successful learning for all students. The study was guided by the following two research questions: (1) how do preservice and inservice teachers understand the concept of universal design for learning and (2) how do preservice and inservice teachers perceive the use of an educational software program in implementing instructional accommodations for students with mild/moderate educational disabilities? Themes emerging from the study included participants' perceptions of universal design for learning and the use of educational software as (1) an effective instructional approach addressing needs of all students, (2) creating high levels of success in learning for students, (3) creating high levels of engagement for students.

One of the greatest challenges for today's teachers is how to ensure that all of their students have access to and success with the general education, or classroom, curriculum. Under the influences of current legislation such as No Child Left Behind (NCLB), outcomes for students with diverse educational needs, including students who receive special education services, are influenced by teachers' ability to clearly depict concepts or "big ideas" and offer students multiple opportunities for engagement with learning (Howard, 2003).

An innovative approach to instruction, universal design for learning (UDL), assists teachers as they meet the educational needs of increasingly diverse learners in schools. By integrating brain-based learning theories, research based best practices, and instructional technologies, the underlying principles of UDL offer powerful applications of how learning can most successfully occur for all students (Howard, 2003; Pisha & Coyne, 2002; Rose & Meyer, 2002).

This project describes how teams of preservice and inservice special and general education teachers implemented the principles of UDL with an educational software program to design instruction for students with mild and moderate educational disabilities receiving educational services in general education classrooms. With these principles in mind, participants in the project observed and coached each other as they created lessons using an instructional format for universal design for learning and applied the principles to their own delivery of instruction. An examination of the teachers' perceptions concerning UDL also contributed to understanding how the general education curriculum can be adapted to create access to and engagement with learning for all students. The study was guided by the following two research questions: (1) how do preservice and inservice special and general education teachers understand the concept of universal design for learning and (2) how do preservice and inservice special and general education teachers perceive the use of an educational software program in implementing instructional accommodations for students with mild/moderate educational disabilities?

Definition of the Problem

To ensure that all students are successful with the general education curriculum, teachers must look closely at how they provide access to the curriculum. The general curriculum is the overall plan for instruction that has been adapted by a school or school system. The purpose of the general curriculum is to guide instructional activities and provide consistency of goals, content, instructional methods and outcomes (Hitchcock, Meyer, Rose, & Jackson, 2002). Orkwis and McLane (1998) describe *access to the curriculum* as opportunities for all students to interact with the curriculum in order to learn.

There must be increased opportunities for students with special needs to access, participate, and progress within the general curriculum (Yell & Shriner, 1997). The landmark Individuals with Disabilities in Education Act (IDEA) amendments of 1997 supported this initiative to ensure access to the general curriculum for students with disabilities. In addition, the reauthorization of IDEA, also known as the Individuals with Disabilities in Education Improvement Act (IDEIA), increased the need for teachers to be better prepared to teach students with disabilities in order to improve outcomes for those students. The IDEIA also requires that students with disabilities be included in state programs of accountability.

Students with diverse educational needs are provided access to the general curriculum through differentiated methods and materials of instruction. All teachers, both general and special educators, are continuously challenged to design instruction that includes a wide range of options for students that will ensure active engagement with learning (Hitchcock, et al., 2002). Universal design for learning (UDL) can be used to deliver the curriculum by assisting with overcoming physical, affective, or cognitive barriers without students feeling stigmatized or isolated (Pisha & Coyne, 2001).

The concept of universal design originated in the field of architecture with the need to provide access to physical structures for individuals with physical disabilities. In 1997, a group of architects, designers, and engineers established the principles of universal design that have influenced environmental design, products, and communication (North Carolina State University, 1997). These underlying principles include (1) equitable use, (2) flexibility in use, (3) simple, intuitive use, (4) perceptible information, (5) tolerance for error, (6) low physical space, and (7) size and space for use (North Carolina State University, 1997). The Center for Applied Special Technology (CAST) and the National Center to Improve the Tools of Educators (NCITE), informed by the work begun in architecture, created the essential framework for universal design for learning (Rose& Meyer, 2002). The three components of the framework are as follow:

1) Multiple means of representation-providing content in different modes-visual, graphic, auditory, for example-so that all students have diverse ways to access information.

2) Multiple means of expression-providing students with many opportunities to demonstrate what they have learned.

3) Multiple means of engagement-providing a variety of ways to involve students in learning (Orkwis & McLane, 1998).

The principles of universal design and the underlying framework of universal design for learning suggest that both fields are distinguished by two characteristics; (1) access that is "built in," rather than "added on," creating functionality and integration and (2) the usefulness and value of design features that benefit all individuals and students (Howard, 2003).

<div align="center">Method</div>

Participants

Participants for this study were eight first year undergraduate preservice teachers in the special education: general curriculum teacher education program at a large southeastern regional university in the United States. In addition there were eight inservice general and special education teachers serving as cooperating (field supervisors) teachers. Participants were teamed together in pairs, one preservice and one inservice teacher to each team. Five general education and three special education inservice teachers served as cooperating teachers. Participation in the study was voluntary and part of the field activities associated with the first semester internship of the special education teachers. All preservice teachers in the internship experience varied and diverse methods of instructional delivery.

Procedures

Through attendance at a two-day training event, participants were provided with model lesson plans and units that are appropriate for their classrooms with an emphasis on how participants can

implement the planning pyramid (Schumm, Vaughn, & Harris, 1997). Table 1 provides the framework for the universal design for learning lesson plan format (Teacher Education Module Series, 1977).

Over a period of four weekly two-hour seminars, each team of preservice/inservice special education teachers was also prepared to coach and observe one another. An observation instrument was developed, with the school collaborator, based on the UDL model lesson plans.

Participants were also trained to explore the use of technology to reduce the perceptual and learning barriers and open doors for student engagement in learning. The teams were given training in the use of the educational software *Kidspiration (*Inspiration Software, 2004) in order to develop organizational tools for their students, particularly in the area of written language. The training with this software allowed participants to increase student access to using computers as learning devices.

In order to have the students more comfortable with writing, a topic was chosen in which they were extremely knowledgeable themselves. Subtopics such as sports, home, family, and pets were provided to the students. Initially they began finding picture representations of these thoughts and ideas. Not only was this a"fun" activity for the students, but they were more likely to choose a variety of pictures that they felt described them.

After completing the picture representations of themselves, students were guided to the outline component of the program, which required them to write at least one sentences about each picture. Interestingly, most of the students wrote two or three sentences about the pictures. This enabled them to add much more elaboration to their writing due to chunking the work within the outline.

Upon completing their formal outline with picture and written responses, the students printed a copy of their completed outline. They were amazed at the length of their writing. This outline led into a discussion on how to divide a story into specific paragraphs. The outline did this for them. The students wrote or typed their final draft of their stories depending on their personal preferences. The end results

were properly formatted stories that included a variety of sentence lengths and a multitude of elaboration and detail.

Each team observed and coached one another as they delivered the UDL lesson that each had prepared using the UDL lesson format. All participants also participated in a focus group interview lasting approximately 1½ hours. As well, participants completed reflective writings in a dialogue journal.

Data Collection

Over the course of the semester, classroom observations, focus group interviews, reflective writings, and anecdotal records were sources of data collected for analysis. Classroom observations were done of the coached teams and researchers examined the teams' feedback to one another using the UDL observation instruments. Four teams (eight participants) were included in two focus group interviews. Focus interview questions reflected how the participants understood their use of UDL to plan and deliver instruction. Participants completed reflective writings using a dialogue journal technique. This dialogue journal began with one teacher describing an event or situation and asking for the other's perspective on the event. This written dialogue continued as the two teachers responded to one another's reflections. Participants were asked to complete at least three exchanges of written dialogue. As researchers visited each team in the school, they kept a record of classroom events and informal discussions as pertained to the use of UDL.

Data Analysis

A content analysis of data was used to target the objectives of the study in order to confirm or disconfirm the inductive interpretation of these data (Mertens, 1998). Triangulation was achieved by having multiple sources of data available for the research question. Themes and patterns were noted across data sources and subsequently discussed between the researcher and graduate assistant. A third reader audited and confirmed preliminary findings by comparing them to the emerging themes and patterns. Extensive peer debriefing sessions were conducted among the researchers and the

participants were asked to do a member check (Mertens, 1998). Generalizations were determined

through analysis, discussion, and further analysis. The findings from the data analysis represented a

synthesis of the data in response to the research questions.

Findings

Emerging themes from the analysis of the data included participants' perceptions of universal

design for learning and the use of educational software as (1) an effective instructional approach

addressing needs of all students, (2) creating high levels of success in learning for students, (3) creating

high levels of engagement for students.

UDL as an Effective Instructional Approach

All participants agreed that UDL appeared to be an effective instructional approach. As one of

the preservice teachers stated

> After I created my lesson plan using the UDL format and integrated *Kidspiration* (educational
>
> software) for the writing task, I realized that all of the children would benefit, not just the
>
> students with learning disabilities. The software gave the students a chance to create a written
>
> project that allowed them to show their best work. *Kidspiration* helps them organize their
>
> papers-the outline function is great!

Several of the inservice teachers did ask if UDL and differentiating instruction were not "one and

the same". This question led to several discussions on how both the preservice and inservice teachers

distinguished between the use of UDL and differentiation of instruction. As one of the inservice teachers

commented, "I think I see that UDL is actually part of differentiating instruction, a strategy that we know

we need to do to meet the needs of all learners in our classrooms."

Participants also recognized how planning instruction using the UDL lesson plan format made

them more aware of differentiating instruction for diverse learners. The questions that are part of the

format created opportunities to reflect on their delivery of instruction and how they were providing access to the curriculum for all of their students.

Creating High Levels of Success in Learning for Students

All participants recognized that the implementation of the UDL lesson, along with the use of the software program, did give students multiple opportunities to express what they had learned. The use of the digitized text format allowed students to manipulate their written work in ways that weren't possible using paper and pencil. Rebecca, one of the inservice teachers commented,

> I have several students for whom writing is extremely difficult-just the process wears them down and they lose focus of what they have learned and what they know because they are struggling with the written product. The software, along with the word processing, lets them be creative and keep their thoughts flowing. They are able to have a completed product that they are proud of.

Creating High Levels of Engagement for Students

All participants recognized how effective instruction can become when students are engaged in the learning process and how the novelty of the software program enhanced this engagement with learning (Hitchcock, et al., 2002). Several participants stated that they could see how some of their most difficult to reach students were excited about assignments when they knew they would be using the software program. Karen, one of the inservice teachers, stated

> Cal is one of my toughest kids-he is diagnosed with ADHD (attention deficit hyperactivity disorder) and he has behavior challenges. He's a really smart kid but I can't get him to focus or sit still long enough to get him to complete any work. Since we've been working with the *Kidspiration* program, he actually looks forward to when we will be writing. He's coming into class and asking when he can get started. I think this is just great!

Overall, while participants' perceptions of UDL as an effective instructional approach and the use of the educational software program were positive, the authors recognized that the small number of participants was a limiting factor in the findings. Therefore, although these findings would not be generalizable to larger similar populations, they do support current research on the use of UDL (Hitchcock, et al., 2002; Pisha & Coyne, 2001; Yell & Shriner, 1997).

Discussion

The use of universal design for learning to meet the educational needs of diverse learners is a promising instructional approach. In addition, the flexibility with which educational software programs offer multiple opportunities for representation, expression, and engagement for student learning is encouraging for teachers as they search for the most effective instructional strategies needed to meet the educational needs of increasingly diverse student populations. As this study reflects outcomes of similar research, these are tools that teachers need to develop expertise with in order to engage students at all levels (Howard, 2003), (Pisha and Coyne, 2001), & (Rose and Meyer, 2002). In addition, teachers need to understand how such approaches to instruction can be designed to most effectively use educational software programs to meet students' individualized instructional goals.

Kidspiration allowed participants to implement universal design for learning easily and effectively in the classroom. In diverse classrooms, meeting all the needs of all the children is hard. *Kidspiration* allowed for children to work on their level and still complete a given activity. For example, for the students who have difficulty reading the subtopics, the voice option allowed for them to comprehend the written material. Students might not be able to understand all words or read all the words in a writing assignment, but with pictorial representations of vocabulary students began using more complex words and thoughts.

Due to the levels of success, the students were actively engaged in writing and reading comprehension activities. For example, Cal completed very few tasks due to ADHD and severe

dysgraphia. He cringed and instantly acted out behaviorally when a writing assignment is mentioned. This program allowed him to begin by organizing his thoughts through pictures. This in itself was remarkable because until this program he would work on a task for a maximum of five minutes before trying to avoid the task. The first day working on the program, he completed the entire graphic organizer by using pictures to identify his thoughts and feelings. It is imperative to note that it took him approximately 40 minutes to complete the assignment. He was determined to find the right picture and took the time to look through all of them. His pride in his work was heart felt. *Kidspiration* opened up a new ways of learning that excited many of the students. They were able to complete the same task but with a different approach.

It is hoped that what we have gained from this study will be expanded to include implementation in increased numbers of classrooms. Opportunities for collaborative training between inservice and preservice teachers in the use of UDL and educational software may help with enhanced understanding of such practices as modeled by the UDL lesson plan. Hopefully, this may lead to more professional interactions between practitioners to design instruction utilizing educational tools that will effectively provide access to and engagement with the curriculum resulting in student success in learning.

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Table 1

Universal Design for Learning Lesson Plan Format

Lesson Plan Format	Important Issues and Questions
Lesson Goals	• Determine the purpose, aim, and rationale for what you and your students will engage in during class time. • Express intermediate lesson goals that draw upon previous plans and activities • Indicate the State or National curriculum standards addressed in the lesson plan. • What are the broader objectives, aims or goals of the lesson/unit/ curriculum? • What are your goals for this lesson? • What do you expect students to be able to do by the end of this lesson?
Lesson Objectives	• Focus on what students will do to acquire further knowledge and skills. Draw objectives for daily lesson plan from broader aims of unit plan. • What will students be able to do during this lesson? • Degree or criterion on basis of satisfactory attainment of objectives is judged? • How will students demonstrate they have learned and understood objectives?

	• Planning Pyramid- what will (some, most, all) students know?
	• · Consider readiness of students- prerequisites allow you to factor in necessary preparation activities to make sure students can meet objectives.
	• What materials and/or equipment will be needed?
	• What textbooks, storybooks, and other resources needed (including bibliography citations APA style)?
	• What needs to be prepared in advance?
Lesson Descriptions	*Provide a general overview of the lesson in terms of topics, focus, activities, and purpose.* • What is unique about this lesson? • What level of learning is covered by the lesson? (Think Bloom's Taxonomy)
Lesson Procedures	*Provide a detailed, step-by-step description of the lesson to achieve lesson plan objectives. Focus on what the teacher(s) will have students do during the lesson. Divide this section into components: Introduction, Main Activity, Closure, and Follow-up.* • Introduction- introduce ideas and objectives of the lesson, address student attention and motivation, relate lesson

	objectives with student interests and past classroom activities, what is expected of students?
	• Main activity- Focus of lesson, describe the flow of lesson, teacher actions to facilitate learning and mange activities, material to be presented to ensure each student will benefit from the learning experience (take into consideration what students are learning- new skill, concept, fact, attitude), lesson technique: list in sequence steps performed, outline info to be explained, discussion – list key questions.
	• Closure- method to help students draw ideas together, provide feedback to students to correct their misunderstanding and reinforce their learning.
	• Follow-up Lessons/activities – suggested activities for enrichment and remediation, lessons to follow as a result of this lesson.
Assessment/Evaluation	*Determine how you will gather evidence that students arrived at intended destination. For example, assess student work using a grading rubric based on lesson objectives or replicate activities practiced as part of lesson.* *To evaluate the objectives that were identified consider providing multiple ways for students to demonstrate knowledge- papers, portfolio, presentations, etc.*

	Be sure students have the opportunity to practice what you will be assessing them on. You should never introduce new material during this activity. Also avoid asking questions that require higher level thinking than they have engaged in during practice. *Consider the knowledge you are evaluating.* • Do they know it? (Declarative knowledge) • Can they do it? (Skills) • Application? (Near/far transfer)
Adaptation/Modifications	*Consider ways to make course content accessible to students with wide range of abilities and learning styles.* • Consider inclusiveness, provide accommodations, physical and cognitive access • Alternate delivery methods (lecture, discussion, hands-on, internet, field work, consider interests, previous experiences- allow adequate preparation time) • Consider providing materials in electronic format • Encourage interactions- (in class questions and discussions, group work, internet-based communications)

	• Provide feedback- prompting during activity and feedback clear. • Plan modifications- plan for academic diversity and individualized needs for students in your class.

Adapted from the *Teacher Education Module Series. Develop a Lesson Plan, Module B-4 of Category B—Instructional Planning* (1977). Ohio State University., Columbus. National Center for Research in Vocational Education