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Universal Design for Learning

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Abstract

This literature review identifies the Universal Design for Learning or UDL method, which consists of educators representing information in multiple formats while providing numerous pathways for students' expression and several ways to engage students' interest and motivation. UDL is one way to address the NCLB (No Child Left Behind) act with a solution that will not only benefit the special needs children, but all children.

With UDL, student curriculum focuses on every child during the design phase. Graphic organizers are a part of every textbook and aide to understand the main topics. Assistive technology devices are available to all children, not just the children with special needs. There exist textbooks and curriculum materials that are re-designed with all children in mind. These resources with additional visuals for better understanding, outlines of main ideas, definitions of harder words, and fonts and colors that are easy to read.

There are many other ways to incorporate the UDL principles that will be mentioned in this paper. Some of the ideas mentioned with the UDL principles in mind include: special software, educational games, access to assistive technology, and other learning materials. This review answers the questions: What types of changes in designs for curriculum materials can be made to help all children to be successful? What types of assistive technology are important to have available to all children? The literature reviewed supports the concept that the Universal Design for Leaming methodology is the answer for better education of all children.

Universal Design for Learning

A Graduate Review paper

Submitted to the

Division of Educational Technology

In Partial fulfillment

Of the Requirements for the Degree

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

By

Cindy Mudroch

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Abstract

  This literature review identifies the Universal Design for Learning or UDL method, which consists of educators representing information in multiple formats while providing numerous pathways for students' expression and several ways to engage students' interest and motivation. UDL is one way to address the NCLB (No Child Left Behind) act with a solution that will not only benefit the special needs children, but all children. With UDL, student curriculum focuses on every child during the design phase. Graphic organizers are a part of every textbook and aide to understand the main topics. Assistive technology devices are available to all children, not just the children with special needs. There exist textbooks and curriculum materials that are re-designed with all children in mind. These resources with additional visuals for better understanding, outlines of main ideas, definitions of harder words, and fonts and colors that are easy to read. There are many other ways to incorporate the UDL principles that will be mentioned in this paper. Some of the ideas mentioned with the UDL principles in mind include: special software, educational games, access to assistive technology, and other learning materials. This review answers the questions: What types of changes in designs for curriculum materials can be made to help all children to be successful? What types of assistive technology are important to have available to all children? The literature reviewed supports the concept that the Universal Design for Learning methodology is the answer for better education of all children.

Introduction

The Universal Design for Learning (UDL) is defined as putting into the original design of learning materials; assistive technology, computer programs, buildings, and accommodations for special needs children that in turn not only help special needs children, but all children. An example is adding a graphic organizer to a social studies chapter to organize the main thoughts for the special needs child. This graphic organizer will also be helpful to all children that use the book. Instead of making the special needs children have different learning materials, the Universal Design for Learning principles would allow them to use the same learning materials with learning accommodations incorporated. For example, textbooks would be made with graphic organizers and additional visuals to help students with learning issues instead of teachers trying to make accommodations after the fact. In this way, the materials will not only help the students with disabilities, but all students. The hope is to have special needs children able to learn side by side with their peers. UDL doesn't stop with just print accommodations, UDL goes on with special paper, pencil grips, talking spell checks, special "wiggle seats," software, electronic learning games and any accommodation that meets the UDL principles.

With the No Child Left Behind (NCLB) act, teachers and schools need to look for ways to improve the way they teach and the materials that they use so that struggling students can be successful. What is the No Child Left Behind act why is necessary for schools and teachers to look for solutions in educating children? Will the UDL principles help to bridge the gap between the NCLB act? The focus of this paper is on how the UDL principles can help students to be successful and at the same time help schools to meet the demands of the NCLB act.

Methodology

This reviewer attended a workshop on October 12^{th,} 2002 at the University of

Iowa entitled "Universal Design for Learning." The workshop provided an introduction

to Universal Design for Learning principles (UDL), followed by current research findings

on the topic using multiple resources. The reviewer is also on the UDL committee at a

local elementary school. Sources of research included the public library, the university

library, and journal searches via the Internet search engines EBSCO and ProQuest, and

journal searches at the local library. Several magazine articles were read and a video on

UDL was viewed. The reviewer talked with experts on UDL to gain a better insight about

projects being conducted at local schools. Several journal articles were read and used as

sources in this paper. The co-executive director of Center recommended the book

Teaching Every Student in the Digital Age: Universal Design for Learning for Applied

Special Technology (CAST). This book provided a basic understanding of UDL and

strategies to integrated the model into the existing curriculum.

As the material was gathered and read, priority was given to well-known journals

and magazines from 1990 to present. This was done because technology is changing so

quickly that to go further back would not give the paper the most current view of what

can be done to help students with disabilities. Next, the reviewer visited the official U.S.

Department of Education website for the NCLB act. The website has a wealth of

information including the full text version of the NCLB act which has 620 pages and can

be found at http://www.nclb.gov/. The No Child Left Behind Act was reviewed and the

government web site was visited for more information. Also journal articles on the No

Child Left Behind act were read to better understand the need for changing the current

curriculum to meet the diverse needs of our students who are failing to meeting the guidelines of the NCLB act.

As the reviewer looked for solutions for teachers, information on the Universal Design for Learning (UDL) was complied. In reviewing articles and books on this topic, it helped to start at the beginning and have some knowledge of where UDL came from and why it is so important for schools, especially considering the NCLB act's impact. Where did the concept of UDL start and why is it so important to schools today in connection with the NCLB act? These questions will be answered as the reader learns more about the NCLB act and the UDL principles.

Analysis and Discussion

The legislation called No Child Left Behind (NCLB) act has schools across the nation scrambling to find out how they will be affected. Reading about the NCLB act helps clarify the importance of using the UDL principles. An overview of the NCLB act is important to fully grasp the implications for schools and understand why changes need to be made in education.

The key idea for UDL is to help all students to succeed by removing barriers from teaching methods and materials by using brain research and new media to strive for three main principles. The three main principles include: representing information in multiple formats and media, providing multiple ways for students to show what they know, and provide multiple ways to engage students' interest and motivation (Rose & Meyer, 2002).

The UDL concept started many years ago with Ronald Mace. He contracted polio at age nine and from then on he set out to remove barriers that he found everywhere. He became an advocate for accessibility and was one of the people behind the Fair Housing Amendments and Americans with Disabilities Act of 1990 (Bowe, 2000). The former President George H.W. Bush signed this act in 1990. The act addressed the rights and needs of those with disabilities. The act prohibited discrimination based on disability in jobs, government programs, public transportation, stores, parks and so on. A person using a wheel chair is no longer excluded from public buildings and job opportunities (Thornburgh & Fine, 2000). After the President signed this act he said, " Let the shameful walls of exclusion come tumbling down"(Thornburgh & Fine, 2000, p. 2). Students in wheelchairs that couldn't attend their neighborhood school, library, church, and store, would finally be able to go without the challenge of barriers.

The early work in UDL was pioneered by Ron Mace who worked for the Center for Accessible Housing at North Carolina State University (NCSU), which was later called the Center for Universal Design (Bowe, 2000). "Ron Mace provided national leadership on accessibility"(Bowe, 2000, p.9). As an architect, Mace showed that putting universal design into the original building construction was cheaper and allowed for better accessibility than the costly additions added later to the buildings to make them accessible. What started as a design for buildings has become the framework for design for education (Bowe, 2000). The change that architecture has gone through must also be applied to the curriculum to meet the needs of the varied learners in classrooms today.

The Center for Universal Design is strongly backed by CAST (Center for Applied Special Technology). CAST believes that designing effective learning environments for those students with more severe learning needs will result in more effective learning for all (O'Neill & Dalton, 2002). Developing and using technology to help students who are struggling to learn to read can also benefit other students. For example, by creating interactive textbooks for children with special needs, the general education students have additional opportunities to learn as well (O'Neill & Dalton, 2002). More information on CAST can be found by visiting their website at www.cast.org.

The UDL principles are one way that educators can address the issues in the NCLB act by adapting curriculum to meet the many needs of students. When President George Bush signed the NCLB Act on January 8, 2002, he asked schools to improve education for all students and not leave any child behind. This new legislation focuses on six key areas, which include testing and accountability, pubic school choice, Title one schools, technology, after-school programs, and flexibility and accountability (Rosenthal,

2002). Title one schools have many students who are performing below grade level. They are given additional staff to work with disadvantaged students in the area of reading. By utilizing the UDL principles, the materials can be made to help more students to be successful and not leave any child behind because of barriers in the curriculum.

States across the nation must incorporate reading and math assessments for grades three through eight. Test scores will be looked at and plans for making all students perform at grade level on state tests within 12 years is the focus. Schools that fail to meet the criteria will get a failing grade. A failing grade can cause the school to have penalties that could include: a change of school staffing, comprehensive curriculum renewal, school-wide restructuring or state takeover (Donlevy, 2002). After three years, a school that continues to fail could be expected to pay for after school tutoring.

Title one programs will receive additional school funding along with several reading incentive programs. One billion dollars has been set aside for technology in the form of grants and money for existing technology within the schools. After-school programs will receive additional funding in the form of competitive grants and money for community-based programs. State and local money will be more flexible and school districts will be able to transfer funds from one program to another except in the case of Title one (Rosenthal, 2002). The NCLB act promotes high standards for learning and states that Title one schools need to have state standards and a qualified teaching staff. "First, since only evidence-based programs with research-proven results will be supported with this funding, schools will need to eliminate any experimental programs with unproven outcomes" (Donlevy, 2002, p.257).

While some schools are very supportive of the new legislation, others have concerns of how the NCLB act will impact their schools. "High-poverty schools in struggling neighborhoods will test the resolve embedded in NCLB..." (Donlevy, 2002, p.257). In another article the author stated that standards would be lowered by the new NCLB act. "Current tests that rely heavily on computer scoring will fail to measure what Americans should prize in their students in order to maintain our number one position in the world" (Graves, 2002, p.20). Graves felt that students having the capacity to show initiative, form questions and recount what they read would not be measured on a standardized test. This is because standardized tests only show a child's ability to read, interpret and fill in dots, missing many of the other attributes important to learning. He is concerned that with the stakes so high, school districts will spend too much time getting students ready for the test and waste valuable teaching time (Graves, 2002).

Based on Graves' is one concerns, why schools need to look at the Universal Design for Learning principles. The government wants higher test scores and teachers need ways to reach a wider range of students and help them to be more successful. Teachers and schools need solutions or they will face the consequences of the NCLB act.

Universal Design for Learning (UDL) comes at a time when the state and federal governments are insisting that teachers find and adapt curriculum to meet the varied learning needs of students, including students with special needs (Rose & Meyer, 2001). With the No Child Left Behind Act, this method for teaching children comes at a very critical time. Educators are also feeling a financial crunch due to the economy. Another area that needs to be addressed is how can the changes be funded.

One plus side of the NCLB act is the number of grants that will be available for schools to help with student learning. These grants could be used to add programs that utilize the universal design for learning principles. One grant supported program is called Reading First, which is an initiative of the new federal law that will provide more than $5 billion in grants for reading instruction in elementary schools over six years. The only catch is that the programs must be researched-based to qualify. Reading First is aimed at helping children in grades K-3 become better readers through researched-based reading programs. The funds are given for six years with priority given to schools that are having the most problems. There are five main parts that combine to make the basis of Reading First. The areas are: phonemic awareness, phonics, fluency, vocabulary, and comprehension (McLester, 2003). This is just one of many reading programs that combines help for students in learning while using the UDL principles of offering access to all children regardless of his or her disability.

With UDL in mind, research on how children learn is being looked at with increased interest. According to a study done by the Yale University reviewers in July 2002, dyslexic children had less activity in certain areas of their brains while they read than those of normal children. Exploration of the brain will continue to help focus the design of technology and learning tools to match the way children learn best (Gladfelter, 2002).

The foundation for UDL principles is taken from brain research. Rose (2001), talks about three broad networks in the brain. He refers to them as recognition, strategic, and affective networks. The recognition networks assist the learner to identify and understand information and concepts. Strategic networks help with planning, and self-

monitoring. And finally affective networks enable learners to engage in learning (Rose, 2001). Gardner talks about the multiple intelligences theory, which says that students have multiple learning capacity (Rose, 2001). In understanding the latest brain research, the reason why UDL principles are important is evident. They include the support of multiple methods of presentation, the support of many different strategic networks, and the support of multiple options for the engagement of the learner (Rose, 2001).

In looking for ways to help students, instructors are advised to focus on choosing materials that utilize the UDL principles (Rose, 2001). The three basic principles for UDL as listed by Rose are:

1. To support diverse recognition networks, provide multiple, flexible methods of presentation.

2. To support diverse strategic networks, provide multiple, flexible methods of expression and apprenticeship.

3. To support diverse affective networks, provide multiple, flexible options for engagement (Rose & Meyer, 2002, p. 69).

Keeping the UDL principles in mind, the question continues of how can we help our struggling students? With the move towards higher reading standards and higher expectations from the government, schools will be looking for answers to help their children be more successful or face penalties. To help their struggling readers/students to be more successful, schools can use the UDL principles as they plan and integrate their curriculum. "There are increased expectations that all students --including those with disabilities-- master general and specialized curriculums. To accomplish that, students must have educational materials that can be adapted to their needs" ("A Universe open to

all", 1997, p.25). This creates the need for better-designed instruction and materials to allow more students access to learning. The law is clear that those with disabilities are to be educated in the least restrictive environment for learning. All efforts must be made to accommodate and create a curriculum that is accessible to the diverse needs of the students.

UDL is a new method for education that allows learning and curriculum materials that are created with all students in mind. Teachers see students along a range of learner diversity. Curriculum, teaching techniques, and resources are designed to meet the needs of the lowest students to the gifted. Students are not left out because of their learning style or abilities; instead the focus is put on providing a learning atmosphere and materials that utilize a student's strengths regardless of their abilities (Pisha, 2001).

A variety of different learning tools can be used with students. Multi-media learning tools can consist of low-tech items all the way up to high-tech complex classroom computers. These new products/ideas give us a much broader curriculum that can meet the diverse needs of the students. This replaces the "one-way fits all" philosophy that is all too frequently found in education (Pisha & Coyne, 2001).

UDL provides teachers with a menu of possibilities to tailor student goals and create curriculum resources that can be used by all students. Appling UDL to meet diverse learner needs requires combining an assortment of tools, programs, materials, and web sites that can be used to meet the needs of a wide base of learners. Flexibility is the key to success with applying UDL principles. Students need to have a curriculum that is adapted to their many learning styles. What works to teach one child contains options that make the learning available and appropriate for students with different experiences and

abilities. The options allow for teachers to think outside the box and allow for different means of presenting information to children. Children learn better when they are focused on something that allows them to apply the knowledge that they know in a medium that they understand (Rose, Sethuraman & Meo, 2001).

UDL has four fundamental ways to shift the design to help to accomplish this goal. First, UDL proposes that children with special needs fall along a range of learning differences not in a separate category. Secondly, UDL incorporates design adjustments that can benefit all students. Thirdly, UDL promotes the development and use of curriculum materials that are flexible and diverse. Fourth, teachers switch the idea of making the students fit the curriculum and instead believe in making the curriculum fit the students (Rose, Sethuraman & Meo 2001).

UDL has many advantages for designing curriculum. For example, a student that is reading well below grade level could still participate in a web-based research project with his or her classmates. By using special software the student could have the text read to her. This would allow her to be able to be an active member of her group as they do research together (Wood, 2001). Scholastic has a product called "Wiggle-Works" which allows teachers to change the background and text color to help students to be able to read text easier. This software will also read individual words or pages to the students allowing students with varied abilities to enjoy the stories (Rose & Meyer, 2002). Many students with disabilities are often forced to read material that is written for younger children. These students miss out on the fun of reading novels like their peers. With the "Thinking Reader" software, students are able to have access to grade-level text. In Boston, 16 students with learning disabilities tried out the "Thinking Reader" software.

"Using the text to speech feature, which highlights each word as the computer reads it aloud, each student moves quickly through a chapter of the adventure novel Hatchet, by Newberry Award-winning author Gary Paulsen" (O'Neil, 2001, p. 32). This gave the learning disabled students a chance to read the same book that their peers were able to read independently. UDL uses computer technology as one way to make the curriculum more assessable to students of varied abilities. O'Neil (2001) reported that teachers find students feel more confident, contribute more in class discussions, and are reading more when they are able to use computer technology to aide with reading. A history text with graphic organizers built into the text helps students with processing difficulties to organize what they read. They do not stand out as "special education" adaptations and can also be used by the regular education students. UDL allows adjustments for the diverse needs of the students by using a curriculum that is varied and allows for student differences. UDL offers learning strategies and materials from the outset of the lesson (Pisha, 2001).

UDL also can be found in well-designed software for helping children to learn. Teachers need to give attention to materials that will provide more opportunities for the students to learn (O'Neil, 2000). She also gave several ideas for the selection of materials to use with students that incorporate the universal design for learning principles. She suggested that materials could be chosen that represents multiple media. "The elements of apprenticeship—models, supported practice, feedback, and opportunities to demonstrated competence—built into the instructional design"(Meyer & O'Neill, 2000, p.35) could also be included. One possibility is using a software program called Fast ForWord (Veale, 1999). Fast ForWord is a computer-based program to help

students that are significantly behind their peers in language development. Students who are delayed in language are frequently the students who are also significantly delayed in reading. According to Veale(1999),Tallal and associates extensively researched auditory stimuli and auditory processing of children with specific language impairment over the last two decades before putting together the Fast ForWord program. "They pointed out that perceptual deficits could be identified in children with reading problems when these children are presented with synthetic speech stimuli, but not when they are presented with nonverbal auditory signals that have acoustic properties similar to the speech stimuli"(Veale, 1999, p.357). The games start with a slow exaggerated speech and slowly speed up the speech making the games increasing challenging for children to tell the difference between the sounds. Essentially the program improves their auditory system and allows them to discriminate between sounds at a faster rate (Veale, 1999). The researchers for Fast ForWord believed that children with processing problems are not able to discriminate as fast as their peers therefore they are not hearing all the differences between the sounds for speech and reading. This deficit causes them to be delayed in speech and language, which in turn causes them to be slow to learn to read. When they hear the sounds "b" or "p", they may sound the same to them, impairing their ability to become good readers. This program is the first of its kind to use brain research to create software to retrain the brain. The research showed an average gain of one to two years growth in language skills after just eight weeks of using the program. A child needs to spend two and one half hours, five days a week, for eight to ten weeks working on the Fast ForWord program. Fast ForWord is a computer-based program that changes levels of difficulties as the child increases their abilities to discriminate among the sounds

(Veale, 1999). "Speech language pathologists, teachers, and parents report increase in overall language abilities, including auditory processing speed, working memory, phonological awareness, listening and comprehension skills, and syntax usage"(Veale, 1999, p.355). The Fast ForWord program has animated characters and asks the child to complete a set of directions. For example, the first game of the program asks the child to put the colored blocks on certain places on the screen. A child uses head phones to minimize distractions. Another game plays different sounds and the child has to discriminate by clicking on the correct spot (Veale, 1999).

Gilliam used the Fast ForWord program with 18 children in his training lab in 1999. He said, "This program helps with difficulties with attention, perception, memory, and reasoning play important roles in some (not all) children's language-learning difficulties"(Gilliam, 1999, p. 363). Additional information can be found by visiting Fast ForWord's website at http://fastforword.com/.

There are many other options for using UDL principles to help students to learn to read. Many companies are developing well-designed materials that can help all students. The new Leap Track system delivers additional instruction in reading, language arts, and math on the popular LeapPad (Lee & Serim, 2002). LeapPad now has the capacity to connect to a PC and the student's progress can be downloaded for an ongoing assessment of how the student is doing (Lee & Serim, 2002). A school in Florida had a chance to participate in Leap Track's national beta-test field study along with 55 other classrooms. Students are each rotated through the LeapPad reading activities during the reading block. The system comes with multiple books at various levels, which makes LeapPad useable with students in general education and special education, allowing all levels of

students to be able to participate in this supplemental learning system. The data can be downloaded at the end of the reading block onto the teacher's computer so the teacher can monitor the student progress. LeapPad has a powerful reporting feature that allows reports on the students' progress in relation to the state reading standards and state assessments (Lee & Serim, 2002). Another great teaching tool that incorporates the UDL principles is the "Thinking Reader"(O'Neill & Dalton, 2002). The Thinking Reader uses traditional print books and adds digital text and instructional learning goals of comprehension strategies, story grammar and decoding. The child can record and listen to themselves read and click on words for help to sound them out. The electronic storybook is an instructional tool to be used with the student and teacher working together. Unlike traditional books, digital text can change in according to the standard or goal set for reading (O'Neill & Dalton, 2002). O'Neal went on to discuss additional suggestions including materials that offer adjustable levels of challenge and web sites that have options for viewing using print and pictures (Meyer & O'Neill, 2000).

In a first grade classroom a teacher uses the universal design for learning during DEAR time. She says "Drop Everything and Read" and around the classroom, all her students become engaged in reading (O'Neill, 2000). A child in a wheel chair uses a switch to activate the computer to read a story. Other students listen to stories on the tape recorder. Some students are reading independently, while others are at the computers using software that has books at a variety of grade levels for students to read or hear. The blind student is reading using Braille. By allowing each student to read at his/her level with the accommodations that he/she needs, this teacher is utilizing universal design and her students are benefiting by all being included in this activity (O'Neill, 2000). Other

methods for presenting materials are available with virtual reality. This allows students of all levels and abilities to see, feel, hear and experience first hand a variety of different experiences related to the subject they are studying (Dolan, 2000). Virtual reality can be used to bring education alive for children. "Virtual reality is a cutting-edge technology that allows students to step through the computer screen into a three dimensional, interactive environment"(Sykes & Reid, 1999). Students can just put on a special headset and glove to visit a simulated environment that feels and looks like the real world. Teachers are able to become facilitators as the students explore using virtual reality. (Sykes & Reid, 1999)

Additional "smart toys" are also on the market to help students to learn. "Ongoing efforts to design educational materials that contain supports for a wide range of diverse learners will result in better materials for all learners, materials that are smart from the start" (Pisha & Coyne, 2001, p.197). Some of the newest smart toys in the educational market focus on various skills which include: Lightspan's comprehensive Early Reading Program, which focuses on critical reading skills including phonemic awareness, decoding, vocabulary, and comprehension; Soliloquy's Reading Assistant, which allows children to work on reading fluency and phonemic awareness using electronic books, Crick's Clicker 4 PlayBox Theme Time; GeoSafari Phonics Lab, which encourage children to participate in activities with the ABC's and, The Early Reading Program which is an online interactive reading program that matches up with the National Reading Panel's guidelines for K-3 (Lafferty, 2002). All of these literacy tools are interactive and fun for children, while teachers focus on the reading standards appropriate for beginning and primary reading students (Lafferty, 2002).

In addition to software and hardware choices, UDL embraces extensive use of low-tech items, which should be available for students in any classroom to be able to use. Some possible low-tech items are: pencil grips, penlight pens, sticky notes, gel seat cushions, fidgets, talking calculators or coinulators, raised line paper, grip rulers, page-up, colored overlays, EZ Readers, graphic organizers, visual study cards, highlighters, and wikki Styx to name a few (K. Larson, personal communication, June 3, 2003). Pencil grips come in a variety of sizes and are put on pencils to make them easier to hold. Fidgets can be squishy balls, small plastic toys, or basically anything a child can fidget with that gives them sensory input without distracting from the task at hand. Page ups are small paper holders that hold one sheet of paper vertical making it easier to read and great if a child is copying onto a word processor. Wikki sticks are colored flexible sticks that attach to paper and can be placed on the lines to make writing easier for the student with disabilities. Colored overlays are great to use with students who are very sensitive to reflective light. By just placing the colored see through overlay onto their book or paper, they are able to read better because it helps to reduce reflection (K. Larson, personal communication, June 3, 2003). Wiggle seats are rubber seats in the shape of a wedge that are filled with air. When kids sit on them, they are able to wiggle without getting out of their seat. This has been very successful at helping students to stay more focused therefore being able to learn more effectively (K. Larson, personal communication, June 3, 2003). Teachers like to sit on them during staff meetings too.

As teachers use the Universal Design method for delivery of their curriculum, they can also use this method for assessment. Many current assessments are designed with few options for the struggling learner. Using the principles of universal design,

students can be assessed positively. For example, a student who is very knowledgeable on magnets, yet is a poor reader, is not going to be unable to show his knowledge on an assessment that asks him to read the questions and write a written response. The solution is a universally designed assessment. "The solution lies in providing a flexible test administration vehicle that provides students the opportunity to demonstrate their understanding and skills according to the particular learning goals associated with the assessment" (Dolan, 2000, p.47). Using the UDL principles for assessment, students who would normally fail on a paper/pencil test are able to share what they know in a way that is appropriate for their learning style (Dolan, 2000). One way to utilize universal design with assessment is to use a student portfolio. "Portfolio assessment, if developed well, addresses key components of a universally designed curriculum. Students express what they have learned in various ways and by using relevant content" (Walther-Thomas & Brownell, 2001, p.225). There are many types of portfolios. Currently Iowa uses portfolios for alternatives to having students take the ITBS test (L. Anderson, personal communication, June 2, 2003). This portfolio has samples from the students' work including notes telling the rate of instruction, an interview, observation, and tests that were given. The portfolios can include print material, digital images and even videos (L. Anderson, personal communication, June 2, 2003). Portfolios offer another way to show what children know. Another type of portfolio is an electronic portfolio. This can showcase a child's academic and performance abilities. The portfolio can show a child's dancing and musical abilities along with samples of their artwork.

Conclusions and Recommendations

With the NCLB act, the need for students to achieve is at a higher priority because of the government involvement and penalties for schools that don't meet the standards. This makes changing the curriculum and adding learning tools a necessity; so all children regardless of their abilities have opportunities to learn. By using the UDL principles schools will be helping students reach his or her potential, while at the same time be able to meet the many challenges faced by the NCLB act.

The year is 2003 and our curriculum is not accessible to thousands of students. Schools need to change and adapt the curriculae that meet the needs of the varied learners in our classrooms. Companies that make learning materials for schools need to keep the UDL principles in mind so all children have an equal opportunity to learn.

Good instructional design should also include the principles of UDL. UDL makes adjustments for the diverse needs of the students by using a curriculum that is varied and put together with good design from the start. With the NCLB act, schools need to look for ways to help their students to learn at a higher level. UDL adds built-in accommodations, which is needed for our educational programs to be more effective.

Good design is also important for learning tools. UDL embraces extensive use of low-tech and high tech tools, which should be available for all students in any classroom. Some possible low-tech items are: pencil grips, penlight pens, sticky notes, gel seat cushions, fidgets, talking calculators or coinulators, raised line paper, grip rulers, page-up, colored overlays, EZ Readers, graphic organizers, wiggle seats, visual study cards, highlighters, and wikki styx to name a few. This allows for the different learning styles of children. Teachers can aide students by providing learning tools and materials to help meet the variety of ranges of abilities in his or her classroom. For example, just by adding

graphic organizers to text books learning disabled students will be able to better understand and organize what they have read. A child who is struggling with reading because of light sensitivity will have greater success by using the color overlays. Many low-tech tools ar e available and inexpensive; they make a world of difference to children with learning differences. Just by allowing a child to sit in a wiggle seat, they will have better attention and therefore work towards reaching their learning potential. The reviewer has wiggle seats for all the students in special education. The kids love the seats and the bonus is they stay in their seats better and have more time on task.

With the No Child Left Behind act, schools can no longer ignore the potential benefits of the Universal Design for Learning. Now is the time to start on a journey that will improve learning for all children. Universal Design for Learning provides students with the tools and curriculum to make learning accessible regardless of abilities. By implementing many of the ideas in this paper, students can start to be more successful today.

In using the UDL principles, students will benefit in all areas of education including instruction and assessment. Reading and math have been taught many different ways over the years, but the government was never been as heavily involved as they are now with the new legislation. The NCLB act has raised the bar for expectations of schools across the nation. Students will be tested and compared to the state standards to see if they measure up to what is expected of them. Penalties will be given to any school that doesn't meet the standards. Grants are going to be awarded to schools for technology and incentive reading programs. It is important that the incentive programs include methods that embrace the UDL principles, so that all children can benefit.

Many advances in brain research have helped researchers to develop innovative ways to help students learn. LeapPad is technology that helps students learn to read and assists teachers in connecting their students' progress with the state reading standards. Digital storybooks allow students to read with the assistance of the computer to practice comprehension, fluency, and decoding skills. Many more software innovations like Lightspan comprehensive Early Reading Program and Soliloquy's Reading Assistant are already available to assist children in their quest to be great readers. Fast ForWord, with their innovative software, offers a chance to help language-delayed students. Fast ForWord is just one of many innovations that can assist students to be successful while using the UDL principles and keeping up with the NCLB act of using scientifically-based learning materials. The sky is the limit when it comes to integrating the UDL principles into the educational curriculum and resources.

The reviewer has seen many children who are expected to learn the same way and same day as their peers. The child "feels stupid", eroding his/her self-esteem, when in fact, just using the basic principles of UDL, the same child would have a better chance of learning. The greatest part of UDL is the way the design really looks closely at the learner and gives the learner every possible advantage to assist them in the acquisition of knowledge. Many of the UDL principles are easily incorporated into the current curriculum and since they are based on scientific research, the ideas are a perfect fit with the NCLB act.

By removing obstacles and adding built-in accommodations or having special assistive technology tools available, students have the best possible chance to learn to his or her full potential. By students learning to their full potential, schools will have one

way to successfully meet the many challenges of the NCLB act. The picture in the

reviewers mind is a class of special education and general education students learning

side by side, with truly no child left behind.

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