Accessibility in post secondary education: Application of

UDL to college curriculum

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Abstract: The inclusion of students with disabilities at the university is a relatively new occurrence in the field of special education. Although legislation in the United States has supported the acceptance of students with disabilities at the post-secondary level, it has only provided minimal support with the emphasis on the learner rather than the curriculum. Now we are looking for multiple ways for students to access learning and demonstrate mastery. Universal Design for Learning (UDL) is currently seen as a means to reconceptionalize curriculum. This study examines the experience of four professors and their effort to use a Classroom Performance System (CPS) as part of reformatting their courses using UDL. The Center for Applied Special Technology, CAST (2001) states that the goal of Universal Design for Learning is to develop teaching methods that enable all students with diverse learning needs, including those with disabilities and cultural differences, to have equal access to classroom curriculum. This paradigm shift echoes the move in special education from a deficit model to a minority rights model put forward by Hahn (1989), and which is the basis of inclusive educational philosophy. Together inclusion and UDL create learning environments that strive to serve all students. This research describes the implementation of clickers as part of the CPS program in college courses in a special education teacher preparation program. The case study demonstrates how technology can provide access for all learners with positive outcomes such as increased participation and application of knowledge. It also illustrates some of the difficulties in making this pedagogical paradigm shift particularly in the use of technology, and the value of overcoming the existing barriers in place.

Key words: teacher education; technology; Universal Design for Learning; curriculum; diversity; students with disabilities; inclusion

1. Introduction

The history of universities and colleges and students with disabilities is a rather recent one. Student attendance at institutions of higher education is a direct mirror of the dispositions of society in regard to individuals with disabilities. When looking back at society in the nineteenth and early twentieth century the dominance of the Eugenics movement demonstrates a social response of rejection and isolation of those with disabilities not one of acceptance and opportunity. Although special education traces its beginning to the late

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eighteenth century and Itard and his work with Victor *The Wild Boy of Avignon*, the idea of post-secondary education is relatively new. Sequin started schools for students with disabilities in the US in the mid-nineteenth century. It took approximately one hundred years for a program to be established at the college level. In 1945 the University of Illinois started the first support program in the states for the individuals with disabilities.

Legislation in the United States also supported the acceptance of students with disabilities at the post-secondary level, particularly section 504 of the Rehabilitation Act of 1973, the American with Disabilities Act of 1990, and the Higher Education Act of 1965. Colleges and universities offered the individuals with disabilities support through programs that arranged for accommodations for the coursework and examinations that the students took as part of their degree programs. As in the public schools the supports were add-ons to the traditional curriculum. The emphasis was on fixing the learner rather than the curriculum. Now we look for multiple ways for students to access learning and demonstrate mastery. Universal Design for Learning (UDL) is currently seen as a means to reconceptionalize curriculum.

The Center for Applied Special Technology (CAST, 2001) states that the goal of Universal Design for Learning is to develop teaching methods that enable all students with diverse learning needs, including those with disabilities and cultural differences, to have equal access to classroom curriculum. A major concern of practitioners of UDL is the creation of classes with equity and inclusion at the core of the learning environment (Pliner & Johnson, 2004). This paradigm shift echoes the move in special education from a deficit model to a minority rights model put forward by Hahn (1989), and which is the basis of inclusive educational philosophy. Together inclusion and Universal Design for Learning, create learning environments that strive to serve all students.

2. Definition of UDL

According to Rose and Meyer (2002), Universal Design for Learning (UDL) applies the idea of the architectural concept of Universal Design in which buildings are made to be accessible to the widest range of users (Mace, 1985). Universal Design for Learning makes access to curriculum for diverse learners a primary goal. This new found accessibility to curriculum is beneficial to all students not only those with disabilities. For example, closed captioning, which was initially designed to accommodate individuals with hearing impairments, has been found to also benefit students who need a multi-modality approach when learning.

In education, UDL translates into creating flexible curriculum, so it is accessible to a wide group of diverse students, while also increasing access to learning for everyone. Rose and Meyer (2002, p. 75), go on to explain the three principles of UDL which are its framework.

(1) Principle 1: To support recognition learning, provide multiple, flexible methods of presentation.

(2) Principle 2: To support strategic learning, provide multiple, flexible methods of expression and apprenticeship.

(3) Principle 3: To support affective learning, provide multiple, flexible options for engagement.

The unifying thread that runs through the above principles is that of giving students different options in order to learn. While this removes barriers to learning for some students, it also gives typical students more and varied learning opportunities. At the same time, UDL is compatible with modern pedagogical theories. This approach to

curriculum does not remove academic challenges (Izzo & Murray, 2003). It provides a wide range of "best practices" that a professor can use to facilitate the learning of all the students in the class.

3. Application of UDL in the classroom

The true test of the UDL paradigm is the application and effectiveness in the classroom at the university. Traditionally a college course in the United States has been a "one size fits all model" in which "too often faculty assume that their methods of delivery are synonymous with the students' achievement of course goals" (Pliner & Johnson, 2004). Typically a professor determines the objectives and outcomes of the course, assigns readings, designs lectures and discussions, and decides on the means of assessment of the knowledge presented. This information is distributed to the students in the form of a written syllabus with each student expected to meet the requirements as stated. The professor's focus is on the knowledge to be imparted not necessarily how students can or cannot access that information.

Today the American student population is one of diversity, not only culturally, racially, but also linguistically. It is estimated that by the year 2050 nearly one quarter of the US population will be Hispanic (2005). In addition, the move to inclusive schooling as mandated by IDEA 1997 and reauthorized as IDEIA 2004, has transformed our classrooms at all levels of the educational process. IDEA has helped to expand the educational horizons of students with disabilities who previously would not have attended institutions of higher education. Now the college classroom reflects not only cultural diversity but diverse learning needs. Therefore the "one size fits all" approach is no longer tenable.

In addition to redefining the delivery model of instruction, UDL seeks to move students from what Friere (1993) describes as the banking system of education where information is deposited into passive students. Universal Design for Learning also promotes "active learning" which is one of the widely acclaimed "seven principles for good practice in undergraduate education" by Chickering and Gamson (2007). UDL fosters greater in class participation in various ways. Specifically the use of clickers and group presentations actively engage students in the curriculum.

4. Classroom Performance System (CPS)

This research looks at four university professors and their individual experiences with incorporating a Classroom Performance System (CPS) into their instruction in an attempt to make their courses more accessible and engaging. CPS is a software that includes response pads or clickers, and receivers with radio frequency technology, to enable students to interact with the content material that is presented in class. Questions can be imported in a PowerPoint presentation and with CPS students responses can be identified or submitted anonymously.

At our university, faculty have the means to present all course materials electronically using an application platform called blackboard. This technology allows professors to link course reading to electronic reserves that students can access on their own computers thereby enabling them to alter text fonts and size to make them more usable. Students can preview class lecture by reviewing the professors PowerPoint presentations and can engage in discussions with their classmates through various discussion boards. Contact between students and faculty via

email increases the ability of students to raise questions, receive feedback and clarification regarding assignments and reading in between class meetings. This technology makes the course content available to the students through the use of the computer, eliminating a number of barriers. The four professors in this study had used the blackboard format extensively. In a step toward more active and interactive learning while expanding access and engagement with curriculum, the decision was made including CPS in the coursework.

5. Research design

This research employed a case study designing to examine the use of CPS in graduate courses by four university professors. Case study can involve one or multiple cases, multiple cases being a variation on the case study format, while essentially the same research strategy (YIN, 2004). The use of case study was appropriate to this research since it described an intervention in a real life situation, explored specific topics relevant to the research, while highlighting aspects of particular importance (YIN, 2004). As Schramm (1971) explains the case study format lends itself to the examination, implementation, and outcome of a decision. In this study, case study allowed the researchers to look at the cause and effect of the decision to implement CPS in graduate courses.

5.1 The instrument

A survey was given to the four professors who used CPS in their courses. It consisted of four open-ended questions that covered various aspects of the use of clickers: reason for implementation of clickers, ease of integration, student response and overall teacher evaluation.

Participants' demographic data were also collected on the survey including years of teaching and self-assessment of technological ability.

5.2 The participants

All four participants were female professors in the special education teacher preparation program. They ranged in age from forty-five to sixty-four. They had worked at the university for between two and eighteen years, two were tenured and two were not. Each had a different level of technological acumen with two younger professors describing a higher degree of knowledge and comfort.

5.3 The procedure

Each of the participants volunteered to incorporate the use of the CPS system in one of the courses they taught during the spring 2008 semester. The technology staff at the university provided training in the correct use and implementation of CPS. The professors reworked traditional PowerPoint presentations used in classes by embedding response questions to enable the students to use their clickers to further engage in the content material.

The courses selected for the pilot varied. Four different types of graduate classes were involved including a foundation course, a technology course, a methods course and a behavior management course. Students were required to purchase the clickers and register them for the classes in which they were used. They were asked to bring the clickers to each class.

After using CPS for one semester, the four professors in the study evaluated the experience. Surveys were distributed to the group and once completed were returned to the researchers.

6. Data analysis and results

In looking at the demographic data collected, it should be noted that the level of proficiency in using technology varied amongst the professors from very skilled to adequate. Although the level of expertise in technology varied, all participants used it in class instruction. As part of a UDL designed course the technology allowed students to preview class presentations, provided an outline of class notes, allowed review for examinations, and enabled access to readings on line.

Question one asked the participants to explain why they decided to incorporate CPS into their class instruction. All four professors expressed interest in the clickers because it seemed to be a way to actively engage all students in class discussion and to encourage students who usually never participate (there seems to always be one or two in each class) to express their opinions. It was felt that the clickers would enable students to risk responding anonymously without performance anxiety or embarrassment.

In question two, the participants were asked to describe the ease with which CPS integrated with the established instructional format. While the professors were extremely enthusiastic about using clickers they found the ease, with which this technology was integrated into class very difficult with multiple failures initially.

Specifically:

(1) The steps and procedures for implementation were very complex and for one professor who used a Mac the steps were even more complicated;

(2) Log in time was found to be so long that it delayed class time;

(3) In some instances computer support was not able to solve initial problems;

(4) The professors were unable to use the university computers or network to run CPS presentations for use of the clickers;

(5) Technical issues slowed down the process;

(6) Some hardware was not caught up with the software.

Question three asked participants to report on their perceptions of student reaction to the use of CPS in their coursework. Professors described their students' responses to the clicker experiment as mixed. Most students balked at the additional expense of purchasing and registering the clickers. Although they complained when things didn't work, students also expressed great excitement when the professors finally got the clickers to function. One student mentioned how the integrated questions raised the level of discussions allowing the class to actively participate in the material rather than being passive recipients of a lecture. Students were pleased when they found out they could resell the clickers to the bookstore after the course was over, minimizing the expense. However, many students expressed frustration with the technical problems which disrupted the class flow and wasted instructional time.

The last question asked the participants to make an overall evaluation of the clicker experiment. All four professors concurred that it was worth the effort and that they plan to use clickers in the future. Clickers were considered to be an effective tool for engaging all students, and increasing the number of pupils who completed reading assignments. The educators also saw the potential in using CPS for other valuable applications. However all felt that more technological support was needed to address the various glitches encountered with the new program.

7. Discussion

The Universal Design for Learning format fosters an educational shift from looking at how to accommodate one student to rethinking curriculum to meet the needs of all students in the class (Rose & Meyer, 2002). All the participants in this case study had incorporated technology into their class instruction previously. The use of the blackboard platform expanded the flexibility of class presentations, allowing student access to materials that they were able to review and modify using the computer. Teacher use of this technology altered presentation and generally involved a move from use of an overhead projector to the use of PowerPoint. Although access was increased, the question of curriculum design was not really considered. When integrating CPS in order to increase student engagement and to monitor student progress, professors needed to make sure that the material being presented was accessible. Teachers were required to look at the learning process rather than solely focusing on course content. This translated into using embedded questions that were meaningful to each student regardless of their ability. Flexible engagement through the use of clickers resulted in full participation in class discourse. Teachers and students reported that when the clickers worked, the level of engagement and the type of discussion increased in both depth and application of knowledge. Because of this all the professors involved in the study wish to continue the use of CPS, regardless of the technological challenges encountered.

The participants reported a number of barriers to implementation of the clickers in the classroom. Primarily the difficulties arose in the areas of the condition of technology hardware and the availability of technological support. Rose and Meyer (2002, p. 161), identify key components of UDL implementation. The first of these components is technology infrastructure and support. They state that "without technological support UDL is just an impracticable theory". Unfortunately, the participants in this study report insufficient technology support. Training was limited and the availability of technicians was lacking. All of which combined to result in a high level of frustration on the part of both the teachers and students. One professor spoke of the increased numbers of steps to use CPS with her Mac since the program was PC oriented. Another participant reported that the program could not be used with the university computer network, and required the use of a personal computer. The university hardware had not kept up with the newest software.

The professors said that the most trying aspect of the use of the clickers was the toll taken on class time. All of the technological issues including an extended wait time for the loading of the program resulted in delays and disruption in the flow of the class. The solving of the technological problems is essential to the incorporation of CPS and the extension of the UDL format. All of the professors said that they hoped that the issues would be addressed and that the system would be able to be blended seamlessly into the class lectures and discussion. They were optimistic and intended to continue to use the clickers since they were dedicated to moving to a UDL model in their classes.

Although the survey did not focus on evaluation, the participants related the unanticipated benefit of formative assessment. Because students were able to respond anonymously, CPS provided a window into the students' learning process. Professors gleaned an authentic assessment of student learning by interpreting clicker responses. This is in sharp contrast to traditional assessments that measure performance summatively and reveals little about student formative learning. As a result of using CPS, teachers were able to redirect their instruction.

8. Conclusion

Even in a university such as ours with a long history of support for individuals with disabilities through accessibility, the movement toward redesigning curriculum is only first emerging. Universal Design for Learning reconstructs curriculum in a way that makes it accessible to all learners, and therefore is integral to an inclusive educational environment. Professors at the university are beginning to rethink how they teach and who they are instructing. UDL is a perfect model for them to follow to enable all their students to access to the knowledge and skills presented in their courses.

Rose and Meyer (2002) stress the practicality of the UDL framework in using technology to maximize learning opportunities and minimize barriers for all students. In today's digital age, educators can avail themselves of technology which supports learners as needed while insuring that they are challenged appropriately. This study demonstrates the effort to implement UDL within the context of higher education classes. The findings of this case study illustrate the challenges inherent in moving to a UDL model. It also highlights the benefits and potential of using programs such as CPS at the post secondary level. This research reinforces Rose and Meyer's (2002) statement that adopting UDL wholesale is not possible. It is not simply a question of one teacher applying the format in one class. But rather to make UDL a reality there must be a commitment of the learning organization to systemic change. This is evidenced by making sure that the technology in place supports the change, along with adequate teacher training, curriculum redesign, and a policy that is dedicated to UDL.

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(Edited by Max and Jean)