Web Technology as a Teaching Tool: A Multicultural Special Education Case

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ABSTRACT

Professional training programs strive to prepare students for success in their respective fields. To this end, considerable time and effort are allocated to developing and implementing activities teacher trainers hope will maximize acquisition of knowledge and its application. Despite sustained and concentrated efforts, however, a gap exists between training and practice, particularly in fields requiring complex decision-making. In the field of education, the process of referring and assessing students for special education services remains controversial and requires professionals to engage in complex decision-making, especially for students from diverse ethnic backgrounds. This paper describes the infusion of a CASELINK multicultural special education case designed to provide pre-service education students a simulated experience going through the special education referral process for a student from Hispanic background also indicating academic difficulties in his general education classroom. The paper describes the case and the methodological procedures employed while introducing the CASELINK multicultural special education module into three special education teacher preparation courses at two universities. Preliminary results using the CASELINK multicultural special education case are discussed and the costs and benefits of using web technology as a teacher preparation tool are highlighted.

Keywords
Special education teacher training, Web technology and teacher training, Problem-based learning and teacher education, Interactive web technology teaching tools

Professional training programs strive to prepare students for success in their respective fields. To this end, considerable time and effort are allocated to developing and implementing activities teacher trainers hope will maximize acquisition of knowledge and its application. Despite sustained and concentrated efforts, however, a gap exists between training and practice, particularly in fields requiring complex decision-making (Gerber, English, Singer, 1999; Langone, Malone, & Clinton, 1999). This persistent chasm brings forth some specific questions regarding the preparation of personnel such as: How can institutions of higher education best prepare their students for the professional field they have chosen? What types of activities maximize student learning and best prepare students to apply knowledge upon entering their fields? This article explores a focused problem of major concern in the field of education: How do educators distinguish between academic troubles related to limited English proficiency (LEP) from those related to cognitive deficits.

Students from ethnic minority heritage are seemingly at higher risks for inaccurate referral and assessment for special education (Artiles & Trent, 1994; Chin & Hughes, 1987; Dunn, 1968; Gersten & Woodward, 1994; Mercer, 1970; Ortiz & Garcia, 1988; Reschly, 1988; Robertson & Kushner, 1994; Tucker, 1978; USGAO, 1981; Ysseldyke, Algozzine, & Richey, 1982). Students with English language limitations are placed at even higher risks for inaccurate referral for special education programs (Artiles & Trent, 1994; Ortiz & Garcia, 1988).

Until recently, claims of disproportionate representation of students from Hispanic backgrounds in special education have emphasized overrepresentation. While overrepresentation persists, in some cases a reverse trend has been noted (Artiles & Trent, 1994; Ortiz, 1994; Reschly, 1988). The new trend is a reversal from over to under-representation for special education services. It appears that some students, who in the past would have triggered a referral from their teacher for special education assessment, are now being under referred. That is to say, behavior and learning difficulties exhibited from students that would otherwise qualify for special education assessment, and in some cases services, are being postponed or ignored by teachers.

While overrepresentation of LEP students in special education programs has been explained as ethnic discrimination by some (e.g., Mercer, 1970, Tucker, 1978), under-representation of students from the same background requires explanation. One explanation might be the difficulty in discerning academic problems that are related to cognitive disabilities from those that are related to second language acquisition. Currently, teachers are in a “Catch 22” with students limited in English proficiency who are also experiencing academic difficulties. If teachers are too quick to refer the child for special education services, they risk not only political criticism but they also expose the student to the potential stigma still associated with special education. On the other hand, teachers who do not respond to the academic indicators for potential school failure exhibited by students with limited English skills run the risk of unjustifiably withholding the appropriate special education services available under the individuals with disabilities education act (IDEA). Clearly, teacher trainers themselves need learning experiences that will assist them in preparing students in teaching credential programs to work effectively with students with different learning characteristics and who are from diverse ethnic backgrounds. What tools are available for training education students to differentiate between learning problems that are related to second language acquisition from problems related to cognitive disabilities?

Computer assisted technology is a tool used by trainers to improve teaching and learning (Fitzgerald & Semrau, 1996; Gerber, English, Singer, 1999; Langdon, Malone, & Clinton 1999; Ochoa, Vasquez, & Gerber, 1999). Multimedia interactive web-based technology is one such example. Multimedia components and higher levels of
interactivity are among the most attractive features of computer supported technology (Baker, 2000; Gerber, English, & Singer, 1999). Video and audio media add appeal to traditional text-based presentation of information. The use of computer-supported technology for teaching and its impact on student learning, however, are in the first stages of development and application (Fitzgerald & Semrau, 1996; Gerber, English, & Singer, 1999; Langone, Malone, & Clinton, 1999).

Fitzgerald and Semrau (1996) describe an example of the development and field testing of interactive multimedia designed to increase problem-solving during teacher preparation with a group of nine participants. In particular, the study evaluates technical aspects of determining user’s preference between accessing information using a keyword search strategy versus accessing information by clicking on icon buttons. Langone, Malone, and Clinton (1999) compared the effects of using full motion video clips with a treatment (n=21) and control group (n=16). Results from the Langone, Malone, and Clinton study were mixed. Gerber, English, and Singer (1999) describe the theoretical framework guiding the design and development of several multimedia special education CD ROM modules. Over a period of several years Gerber and colleagues have meticulously fused problem-based learning theory and case methodology approaches in the development of several interactive multimedia CD ROM prototypes designed as training tools for students in introductory special education courses. Gerber, English, and Singer (1999), however, stop at suggesting the utility of the CD-ROM computer-assisted cases as tools for increasing problem-solving skills in education students. While all three sets of researchers are interested in developing tools that assist in the preparation of teaching professionals, CASELINK responds to the need to train education professionals in the special education referral process for students who are limited in English proficiency and from minority ethnic backgrounds.

This paper describes the use of a CASELINK multicultural special education case designed to provide pre-service education students a simulated experience going through the referral to special education for a student from Hispanic background who also indicated academic difficulties in his general education classroom. The paper includes three major sections. The first section describes the multicultural special education case. The second section is a description of the methodological procedures followed while infusing the module into three special education teacher preparation courses at two universities. The third section provides preliminary results using web technology and highlights the costs and benefits of using web technology as a teacher preparation tool.

CASELINK Multicultural Special Education Case Description

The CASELINK multicultural special education case (also referred to as module) is an authentic story of a student limited in English proficiency who is also having academic difficulties in his general education classroom. This case highlights the complex process experienced by educational professionals in differentiating between problems related to second language acquisition to those that are related to cognitive limitations. The CASELINK multicultural special education case module is designed so that users work through a process similar to the referral process for special education services. The module has three phases: framing the problem; searching for information regarding the problem; and resolution of the problem.

The first phase of the module is called “framing the problem” and begins with a narrative introducing Andres, the student being depicted in the multicultural special education case. Viewers see a still photograph of Andres accompanied by demographic information (e.g., name, age, birth place, family background) provided in text and audio. After the narrative, viewers proceed to a menu driven section where they begin to interact with the module as they begin gathering, or searching, for information about Andres. From a menu, users can select the type of information they want to access. For example they can observe Andres in his classroom or in the playground through video clips; interview professionals (e.g., general or bilingual educators) by selecting questions and hearing answers provided from the professionals involved with Andres; or view Andres’ work samples (writing, coloring). Users are free to select the order in which they access information. This phase of the module ends by having students “frame the problem”. The module presents three questions: 1) What are Andres’ strengths and weaknesses? 2) What problems do you think Andres is having in school? 3) What do you see is being done in school? Questions are intended to help students organize the information they have gathered.

The next phase continues the search for knowledge through the module’s role strands, the cornerstone of the module. The role strands section of the case requires participants to assume the role of one of several school professionals (i.e., school psychologist, parent advocate, special educator, principal, general educator, or bilingual educator) or family representative. Whether the course instructor assigns students to one of six roles (Figure 1) or students select the role they want to assume, students proceed to gather role specific information by
Students are encouraged to take notes as they go through the role strand by using the notepad within the module and are free to explore other role strands as they wish. Figure 2 illustrates the General Education Teacher role strand and type of questions and information the student can access within the role strand. Students can access more information by clicking on questions or items within each individual role strand. Since each role strands contain different information they provide the basis for simulating a group of education professionals who have different information and viewpoints about Andres. In theory, that role-specific information will influence the decisions each student makes about Andres. This phase of the module ends with a group activity in which each student team develops an educational plan for Andres by following three steps.

Figure 1: CASELINK Interactive Multicultural Special Education Case Role Strands

The final phase of the module is the “problem resolution” and involves several steps for student teams to complete. Each step makes use of information found within different role strands. In the first, the module instructs student teams to assume that Andres qualifies for special education services as learning disabled with language delays and prompts student teams to consider the types of assessments they would give Andres. This step makes use of information within the psychologist role strand. Then student teams are prompted to propose a daily school schedule for Andres. Students are prompted to consider where Andres will receive instruction and who will provide instruction to him in each of the activities proposed in the daily schedule. The team is also to decide whether Andres should be taught in English or Spanish. This step makes use of information found within
the Bilingual Educator role strand. The final step of the student activity and the most challenging, is writing three goals for Andres. As a group, each team is expected to identify and agree upon three goals for Andres to carry out in the coming year. Student teams are to provide the present level of functioning, what Andres will do to achieve the goals, when he will complete the goal and how the team will measure the attainment of each goal. After the team submits its version of Andres’ educational plan, student teams compare and contrast their version of the educational plan to the educational plan developed by the team of professionals who actually worked with Andres. The module displays video clips of Andres’ multidisciplinary team (i.e., psychologist, parent advocate, bilingual educator, general education teacher, principal, and special educator) telling how they resolved the problem.

Method

Because web technology is still in its infancy, and field testing of new technologies is recommended (Gersten, Baker, Lloyd, 2000) CASELINK has designed a research agenda to field test each special education module. This study was interested in two general but related issues. The first goal was to determine the saliency of the information contained in the module and the degree to which it elicited the intended responses from its users. The second goal was to document the process of using interactive web-technology in introductory special education courses serving pre-service teachers in two different institutions of higher education. The following sections describe the participants and procedures implemented in this study.

Participants

Preservice undergraduate and graduate students (N=127) enrolled in three special education courses taught by different professors were involved in the field testing of the CASELINK multicultural special education case. Table 1 contains descriptive information about participants and course instructors.
The study was conducted over a period of four weeks and involved several activities. Two of the three courses met once a week for 2.5 hours. The third, and larger, course met twice a week for 75 minutes each. In the first week, course instructors introduced participants to the Problem-based learning (PBL) instructional approach and a brief explanation of the different special education continuum of services (e.g., itinerant services, resource room, separate special education class, separate special education school) using a lecture format. Participants received technical instructions for navigating through the module and were given time to explore. Participants were then assigned to read a chapter on learning disabilities and complete the narrative section of the module independently and outside of class. Each participant was expected to provide a written response to questions at the end of the narrative section (i.e., What are Andres’ strengths and weaknesses? What problems do you think Andres is having in school? What do you see is being done in school?). Participants were instructed to submit responses to questions electronically following the prompts within the module.

During week 2, students were assigned to small groups and assigned to one of six role strands (i.e., special educator, general educator, psychologist, bilingual educator, parent advocate, principal) within the case. Students were instructed to complete activity 1 by following prompts within the module and submit responses electronically. Then groups were instructed to complete the problem identification section of the module and to discuss questions within the module as a group. Individual student groups were expected to provide a summary of how the group framed the problem by submitting a written response to the question ‘How does your group frame the problem?’ within the module. Like previous responses, students were instructed to submit their responses electronically from within the module. As homework, participants were assigned to read a chapter on multicultural education and to review their respective assigned role strand. For example, participants assigned to the special educator role strand reviewed that section while participants assigned to the bilingual educator role strand reviewed the bilingual educator role strand. Participants were encouraged to select and print any information within the role strands and to bring in any other source of relevant outside information.

In week 3, participants received a mini-lecture from their instructor based on the chapter assigned for students to read on multicultural special education. Students were provided time to meet as a group to discuss the case and to write an educational plan for Andres following prompts within the case. Group members discussed, negotiated (agreed upon), and wrote an educational plan for Andres. Participants were instructed to review the professional’s decision section of the module after their group finished writing their educational goal for Andres.

During week 4 of the web activity participants were directed to review the professionals’ educational plan for Andres and provide a written comparison of the professionals’ plan to their plan. Participants reflected upon and wrote how their educational goal for Andres differed from the professionals’ goal found within the case. All written responses were submitted electronically and within the module.

Results

This section describes student responses to the questions imbedded in the multicultural special education case, and the process of using the multicultural special education in three special education courses. The first goal of this study was to determine the relevance of the information contained in the module and the degree to which it elicited the intended responses from its users. In other words, does the module convey the information it was designed to convey?
Participants’ Response to the Question “What are Andres’ Strengths and Weaknesses”

Because teachers are generally criticized for neglecting student’s strengths and focusing on the weaknesses when the student is suspected of having a disability or is from a different ethnic background, the multicultural special education module was designed to provide users with information about Andres strengths and weaknesses. Below are selected excerpts from participants’ responses to an open-ended question asking users to describe Andres’ strengths and weaknesses.

Andres is socially active, based on the candid shots and recess video footage. Additionally he has not given up...despite his struggles...His family seems interested in his progression, despite the fact that the primary educator does not speak English adequately enough to convey his academic strengths...Clearly, he has difficulty with letter-sound correspondence. Additionally his writing skills are emergent. Apparently he also struggles with very basic math skills, including one to one correspondence...

Andres’ strengths include his social and athletic abilities, and his skills in art. He seems very active and has a drive to participate. (The example of show and tell every Friday.) Weaknesses would be his problems with letters and sounds of the letters (both in Spanish and English). His math skills were very limited even when assisted by another student who could speak in Spanish and English.

Andres’ strengths seem to be his social ability. He seems to enjoy his classmates...After hearing teacher’s comments and viewing some of Andres’ work I have seen that compared to his classmates he is behind in reading, math, and his writing skills. Things that have been taught to him have not been well retained is a weakness that really needs to be worked on overall.

A weakness for Andres is that he is required to be taught primarily in English with the new laws in California since he began kindergarten in Spanish. This change in language will only cause him to be further behind his peers academically.

What problems do you think Andres is having in school?

Participants discussed the difficulties that Andres was presenting in both Spanish and English, two participants’ response to the question “What problems do you think Andres is having in school” were as follow:

...Andres is having difficulty in being able to balance his Spanish and English. ...but it also seems that his problems extend beyond his confusion between languages. ...his inability to recall or his academic skills in Spanish are just as limited as his English. I think this case is difficult to say whether he has a learning disability or if he is just confused and works slower because he is having difficulty creating a balance between Spanish and English.

I assume that Andres has a learning disability because he is low in both math and language arts. Not being able to add and not knowing his sounds and letters in first grade is a clue that he is not performing at the level that he should be at...

Describe your group’s process for developing Andres’ Educational Plan. What conflicts arose and how were they resolved?

The study was also interested in determining how to provide students with opportunities to develop skills to work within a multidisciplinary team of education professionals. Undergraduate and graduate student group responses to an activity embedded within the special education case represent collaborative group identification and assessment of the problem and their concerns about Andres. Three excerpts from participants’ responses illustrate the nature of groups’ interactions as they assessed Andres and prepared to respond to Andres’ educational needs.

The process that our group went through in order to decide on a final product for Andres was rather stressful and complicated. ...We seemed to agree on all aspects of our goal, but there were
several problems we ran into that were due to our misunderstanding or lack of information. What I realize is that the process that we went through could have mirrored that actual process that would occur in trying to plan a case like this. There are so many missing factors that you have to fill in, and there are so many questions that not everyone can answer. It seemed that in order to make this plan, we needed to come up with the most realistic goals.

This process was extremely hard…but I know that this process is something that I may be confronted with in the near future and it was a really informative activity, one that I think has given me insight in the amount of planning and communication that has to occur between several different groups in order to achieve anything.

The activity, to develop an educational plan for Andres, was challenging but informative. My group deliberated our personal views for more than an hour. We discussed the positive and negative consequences of each idea. We developed the final product through compromise and the consent of the majority. We worked very well together to enhance our learning of the IEP (individualized education plan) process.

Discussion

Differentiating between academic difficulties related to second language acquisition from those related to disabilities is a formidable task. Teachers of students from an ethnic minority background who have English language limitations are accused of failing to consider that the student’s academic problems could be related to English language limitations, not cognitive deficits. As indicated previously, some argue that the problem of overrepresentation of students from ethnic minority groups in special education is largely due to unfavorable cultural biases (Tucker, 1980). Implicit in their argument is the notion that general education teachers refer students for special education services prematurely and without considering that the academic difficulties might be related to second language acquisition. Furthermore, teachers are also criticized for focusing on students’ weaknesses and neglecting strengths when a student is suspected of having a disability. Participant responses to two questions imbedded within the CASELINK multicultural special education case module suggest that the module can provide training opportunities to address these two problems.

The CASELINK Multicultural Special Education Case Has the Potential to Train Education Professionals Against Focusing Only Students’ Weaknesses

Participants’ responses referenced different aspects of the module to identify Andres’ strengths and weaknesses. As illustrated by two selected responses, participants identified Andres’ academic weaknesses by noting that he “has difficulty with letter-sound correspondence” and that he “also struggles with basic math skills”. Another participant responding to the same question noted that “Andres is weak in retaining the information that is taught to him and after hearing his teacher’s comments and viewing some of Andres’ work he is behind in reading, math, and writing skills”. Aside from noting his weaknesses, however, participants’ responses to the same question suggest that the CASELINK multicultural special education case also prompted participants to identify Andres’ strengths. The three quotes included as examples of participants’ responses refer to Andres’ social abilities. One participant stated that “Andres is socially active based on the candid shots and recess video footage”. The same participant also indicated another strength for Andres was that “his family seems interested in his progression, despite the fact that the primary educator does not speak English adequately enough to convey his academic strengths”. This student’s response is especially significant because the student who provided this response is not repeating information directly stated within the case. Rather the student is deducing from a video clip found in the Parent Advocate role strand in which Andres’ mother, who does not speak English, tells the parent advocate about Andres behavior at home. Based on participants’ responses to the question “What are Andres’ strengths and weaknesses” it is appropriate to conclude that the CASELINK multicultural special education case surpassed its intended purposes. Not only did it provide training opportunities for future educators to identify students’ strengths and weaknesses but the multicultural special education case might also strengthen teacher/parent relationships by dispelling the commonly held assumption that parents of Hispanic students are not properly aware or involved with their child’s education.
Teachers Fail to Consider that Academic Difficulties in Students With English Language Limitations Might be Related to Language Not Cognitive Deficits

In the first quote the participant notes that Andres’ academic difficulties might be related to confusion between English and Spanish. However, also noted in the response is the student’s assessment that Andres’ problems “extend beyond his language confusion.” The student provides supporting evidence about Andres’ inability to recall information and points out that Andres is having academic difficulties in both languages.

This participant’s response illustrates that some students did appreciate the complexity of determining the cause of academic difficulties in students who are limited in English proficiency. Preliminary field testing of this multicultural special education case module suggests that the case did convey information necessary for student teachers to appreciate the complexity and challenges when a student from a different cultural background is experiencing academic difficulties. Participants’ responses suggest that the multicultural case can help teachers consider and think about why a student from a multicultural background is experiencing academic difficulties. Based on responses like the one provided, there is no indication that teachers using this module will refer students who do not speak English and are also experiencing academic difficulties without considering other factors that might explain those difficulties.

Does the CASELINK Multicultural Special Education Case Convey the Complexities of the Special Education Referral Process for a Student from a Multicultural Background Who is Also Experiencing Academic Difficulties?

The stigma associated with special education services and the lack of training to work with students from different cultural backgrounds makes differentiating between academic difficulties related to second language acquisition from those related to disabilities a formidable task. As indicated previously, some argue that the problem of overrepresentation of students from ethnic minority groups in special education is largely due to biases related to language issues. Implicit in their argument is the assumption that teachers who refer students for special education services do so because they lack appreciation for second language acquisition. While not all participants discussed the difficulties that Andres was presenting in both Spanish and English, one participant response to the question ‘What problems do you think Andres is having in school’ was as follows:

…Andres is having difficulty in being able to balance his Spanish and English. …but it also seems that his problems extend beyond his confusion between languages. …his inability to recall or his academic skills in Spanish are just as limited as his English. I think this case is difficult to say whether he has a learning disability or if he is just confused and works slower because he is having difficulty creating a balance between Spanish and English.

This participant’s response illustrates that some students did appreciate the complexity of determining the cause of academic difficulties in students who are limited in English proficiency. Preliminary field testing of this multicultural special education case module suggests that the case was successful in teaching pre-service teachers about the special education referral process and the complexity of referring a student from a different cultural background for special education services. Furthermore, the results from this study suggest that pre-service teachers understand the challenges of working effectively within a multidisciplinary team of education professionals when teaching Hispanic limited English proficient students.

Participants’ Informal References and Unsolicited Evaluation of Andres’ Case

If student evaluations of professional training activities qualify as indicators of their meaningfulness and relevance for future education careers, then the CASELINK multicultural special education case achieved its purpose. Post hoc analysis of course evaluations from one of the three special education courses conducted as normal end of the semester procedures revealed that students’ evaluation of the web-based activity was positive. Thirty-one of the 88 (35%) student course evaluations made unsolicited reference to the case. Twenty-four of the 31 (77%) participants’ comments indicated positive experiences with the case and made reference to the activities usefulness for their future teaching careers and for working with students who are English language learners. Participants’ who made less than favorable remarks about the web-activity indicated technical problems and comments about needing more time to complete the activities. Students’ comments of the web-based activity at the end of the semester are worthy of mention and important for at least two reasons. Perhaps most important
aspect of these results is the long-term effect of the web-based activity. The web-based activity took place during the first three weeks of a 15-week semester and was recalled at the end of the semester, suggesting that the activity was sufficiently prominent in the students’ classroom experience to generate comments at the end of the semester. Based on these results, it is possible to speculate that viewers are engaging meaningfully with each other in discussions about Andres’, his family, and ways to respond to his academic needs.

**Web Technology as A Teacher Preparation Tool**

This study provides critical information about the process of using web technology as teaching tools. Overall, the enthusiasm for using web technology as a tool for teacher preparation has not waned. Through this study, teacher trainers interested in including interactive web technology in their courses can anticipate some of the issues that arise when using the technology. Results provide insight into the skills teacher trainers must have when using web technology. This study has indicated that:

- web technology takes on a life of its own, one that instructors might not always convey to students,
- some students were so engaged in their assumed roles that they expressed genuine frustration when they had to wait for the student study team to negotiate educational goals for Andres,
- the role of professors as deliverers of information included becoming a mediator between hardware and students when students experienced technological difficulties,
- the traditional understanding of time-on-task for activities had to be redefined (when students were engaged in activities they stayed engaged for hours, when students were not engaged, they completed the assignment in a few minutes),
- the module’s use of video tape created situations in which students viewed live classroom scenes but they focused their attention on different aspects of the video tapes and sometimes missed the critical aspect of the video clip,
- professors must possess group management skills in order to facilitate effective communication and cooperation among groups.

**Future Research**

Results from this study will be used to guide the next step in field testing the impact of web-technology as a teaching and learning tool. The next research agenda step is to determine what aspects of the multimedia problem-based learning special education case is responsible for student learning. Therefore, subsequent studies will include a control group and focus on identifying objective and testable student outcomes (e.g., scores on tests) before and after exposure to the CASELINK multicultural special education case.

**Authors’ Note**

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