Engaging Older Students With Reading Disabilities



Is there a creative and engaging way for special educators to support older students with reading disabilities (RD) in inclusive classrooms? Can technology be used to promote all students' comprehension skills? For our students, the answer was "yes!"—by creating multimedia inquiry projects using reading assistive technology.

Creating accessible and engaging lessons for students with RD in inclusive classrooms is particularly challenging for special educators in upper elementary and middle school settings. Older students with RD have difficulty accessing the texts that serve as the basis for instruction; years of repeated failure can leave them discouraged and unmotivated. It is imperative that special educators find ways to allow all students, including students with RD, to be successful in the general education class-

Multimedia Inquiry Projects Supported by Reading Assistive Technology

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room. Both the No Child Left Behind Act of 2001 (NCLB) and IDEA 2004 stress this necessity of accessibility and progress in the general education curriculum. As a result, educators are increasingly integrating the ideals of universal design for learning (UDL) into their teaching (Garderen & Whittaker, 2006; Rose, Meyer, & Hitchcock, 2005). Innovations in instructional technology provide teachers with opportunities to expand the ways in which they present lessons to students with disabilities.

We combined the use of multimedia and reading assistive technology with the UDL principles of access, presentation, and motivation in developing a summer reading clinic project where students created Microsoft PowerPoint 10.0.6 inquiry projects. (See boxes "What Are Multimedia Projects?" "What Is Reading Assistive Technology?" and "What Is Universal Design for Learning?") This article describes the five steps of the project, and gives examples of student work. The student projects were integrated into a comprehensive reading intervention program designed to improve the phonological awareness, decoding, fluency, and reading comprehension of 10 upper elementary and middle school students with RD. We also developed a rubric to evaluate the multiple purposes of the project. A description of the rubric follows.

What Are Multimedia Projects?

Multimedia projects are a creative and proficient way for students to present information across the curriculum (Carlin-Menter & Shuell, 2003; Gardner, Wissick, Schweder, & Canter, 2003). Multimedia gives students access to various technologies to develop and present inquiry projects, and to incorporate media from scanned texts, pictures, videos, and Internet sites. Computer software programs such as Microsoft PowerPoint enable the student to integrate such design elements as text, background, graphics, video, sound, and animation. Inquiry projects using multimedia encourage students to be active problem solvers and determine ways to best represent their ideas (Lehrer, Erickson, & Connell, 1994).

What Is Reading Assistive Technology?

Students identified with a learning disability (LD) are growing in number and nearly 80% of these students have a primary disability in reading (Ashton, 2000). Generally, students with RD have deficits in phonemic awareness and analysis, word identification, reading fluency, and comprehension (Forgave, 2002; Higgins & Raskind, 2000; Manset-Williamson & Nelson, 2005). Reading assistive technology with a speech component presents a bimodal (auditory and visual) approach to instruction that supports students in each of these areas. Montali and Lewandowski (1996) found that a bimodal approach to instruction aids in the reading comprehension skills of students with LD. Additionally, reading assistive software with a speech element has been shown to impact comprehension by providing information with accuracy and at an accelerated rate, which might not normally occur if read without the support of the technology (Raskind & Higgins, 1995). We used Kurzweil 3000 assistive reading software: scanned-in or Web site text is read aloud by the software while text is highlighted, allowing students to receive text information that is not impacted by their decoding skills. In creating our multimedia inquiry projects, Kurzweil 3000 provided the scaffold of support necessary to allow our students with RD to participate more fully in the inquiry process.

Why Use Multimedia Inquiry Projects?

Multimedia inquiry projects can be designed to complement and support students' development of reading comprehension skills across the curriculum. These projects require students to read for meaning and to apply a generally recognized reading strategy of identifying and summarizing main ideas (Gersten, Fuchs, Williams, & Baker, 2001; Manset-Williamson & Nelson, 2005). The organizational structure of the project-create key questions, summarize ideas, and create a storyboardis designed to mirror the text structure of expository text. In structuring the projects, students have the opportunity to construct the type of text they are meant to comprehend in subjects across the curriculum. This organizational structure also addresses deficits in the recognition of text structure found in many students with LD (Williams, 2003). The authenticity of the task and novelty of the multimedia provides an opportunity for all students, including those with RD, to practice comprehension strategies within a motivating activity.

What Type of Background Preparation is Necessary?

Multimedia PowerPoint inquiry projects require similar background preparation as do other instructional activities in an inclusive classroom. This includes identifying an area of the curriculum where integrating these projects supports the goals and standards of the discipline; providing students with instructional materials, support, and guidelines for the successful completion of the activity; and ensuring adequate class time is allotted for working on the projects. For example, our students were instructed to include at least eight slides and three resources (minimum of two books and a Web site) in their projects. Time was allotted for student research in the school media center and on the Internet, for in-class preparation activities, and for creating their presentations in the computer lab. For the complete project, our students received one 25min session per day for 4 days per week for 5 weeks.

Steps in Creating Multimedia PowerPoint Inquiry Projects

Step 1: Introduction Sessions

Introduction to the projects begins in the computer lab and extends to the classroom (see Figure 1). We recommend that students be introduced to the concepts of multimedia inquiry projects, and then explore examples of PowerPoint presentations. (There are a variety of student-created PowerPoint presentations on various topics avail-

What Is Universal Design for Learning?

The Center for Applied Special Technology (CAST; www.cast.org) uses the term "universal design for learning" to describe initial curriculum adaptations that amplify student "engagement, expression, and representation" of learning and information. Principles of effective UDL provide all students, not just those with disabilities, multiple ways to access the general education curriculum, to present knowledge, and to motivate the students to learn. The initial integration of technology into instruction can meet student needs in these ways (Rose et al., 2005).

able on the Internet that can be downloaded to student computer desktops.) This provides students with models of finished products and presentation ideas. The introduction sessions also should include demonstrating the utilities of the reading assistive software (see box, "Examples of Reading Assistive Software"). Our students used the Kurzweil 3000 assistive reading software in their reading clinic instruction, but had not been exposed to extended features of the software (reading scanned texts and Internet sites) prior to beginning the multimedia PowerPoint inquiry project. A guided practice session was devoted to using the software in this new way.

The introduction sessions also should include instruction on the step-by-step procedures of storyboarding, either in small groups or through a PowerPoint presentation to the whole class. It is important to provide the students with individual storyboard worksheets as handouts, along with large poster boards and sticky notes to use in creating their individual presentations. It is equally imperative that students realize the planning of the presentation begins with the storyboard, and the storyboard elements represent slides in their presentations. The storyboard provides the students with a visual representation of the structure of their projects.

Figure 1. Steps in Creating Multimedia Inquiry Projects



Step 2: Inquiry Session

Once students identify their research topics, we suggest structuring their inquiry process. We presented our students with individual organization templates to use in their quest for information. Inspired by the reading comprehension strategy POSSE (Englert & Mariage, 1991; Englert, Tarrant, Mariage, & Oxer, 1994), we designed a mnemonic template that was an adaptation of POSSE (POSE) with four sections: Predict what information you will find out about your topic; Organize your thoughts; Search for information about your topic; and Evaluate your results (see Figure 2). A whole-class demonstration can be given on how to fill in the template, and then students can work alone, in pairs, or in small groups to begin using the template for their inquiry projects.

Step 3: Resource Sessions

Several sessions need to be devoted to gathering information to be included in the projects. Our students spent six sessions gathering and analyzing resources. We suggest beginning with a visit to the school media center and having the students acquire library books on their topics. Students then spend time looking through the books, noting pertinent information, and scanning desired texts using the reading assistive software. Compact discs can be used to store scanned material, allowing students CD access to their topics using the reading software on their computers. Individual tutors supported our students at the computers and took studentdirected notes for use in storyboard production. The students then used the reading assistive software when visiting relevant Web sites and had their tutors take notes concerning information and Internet addresses. The structuring of the activity and support of the tutors was vital. In an inclusive classroom, some of the tutor support might be replaced by using technology to generate ideas, develop questions, and create storyboards. Students with RD also could be paired with a more able peer.

Step 4: Storyboard Sessions

The development of the storyboard is an important step for students, as it represents the organizing of the PowerPoint presentation, and demonstrates how the student chooses to demonstrate comprehension of the inquiry topic. Our students spent three instructional sessions developing their large storyboards for their PowerPoint presentations. We provided scaffolds of support, including reminding them to refer often to their inquiry method template for organization, and providing them with guided questions to refine the research topics. The notes that were created were listed on their storyboards, along with picture ideas and Web site information. All of the students completed their storyboards before working in Microsoft PowerPoint.

Step 5: PowerPoint Sessions

Following storyboard production, we suggest that the students participate in a

Examples of Reading Assistive Software

Kurzweil 3000

(www.kurzweiledu.com)

Kurzweil 3000 provides a visual and auditory presentation of scanned texts and Internet sites. Either scanned or Web site text is read aloud by the software while the text is highlighted. Additional features include controlling reading rate and amount, choice of voices, and MP3 capabilities.

Text Help Read & Write 7.1 Gold (www.texthelp.com)

This product is an add-on, and can be accessed while working within standard Microsoft Windows applications such as Microsoft Word and Internet Explorer. It provides a visual and auditory presentation of text. New capabilities include RealSpeak[®] solo voice, FineReader[®] scanning, speech input, MP3 capabilities, and improved word prediction.

ZoomText® 8.1 Magnifier/ScreenReader (ww.assistivetechnologies.com)

This product allows for text magnification and color enhancement. The speech output can be turned on and off, and the program includes rate controls within documents and Web sites. It has built-in support for applications such as Microsoft Office and Internet Explorer. guided practice lesson using Microsoft PowerPoint. We devoted a whole session to this activity, allowing time to address student questions. The remaining class sessions can then be spent creating the presentations. All of our students completed this task and presented their projects to family and fellow classmates on the final day of the summer reading clinic. This final step of presenting to an audience added to the meaningfulness of the endeavor.

Rubric

For our summer reading clinic project we developed a 4-point rubric (using the Web site http://rubistar.4teachers. org) to evaluate the multiple purposes of the project. The rubric comprised four domains: inquiry process, focus on research question, organization, and graphics and sound (see Table 1). The first domain, inquiry process, examined the successful completion of the project steps. All students received full credit in this area. The second domain, focus on research question, evaluated the focus or main idea of the presentation, and the quality of the supporting details. All students were able to gather useful information that focused on their research questions. For example, Greg (not his real name) created a Power-Point presentation about Thomas Edison. He presented information about the inventor's humble beginnings, educational trials, jobs, work ethic, and inventions (see Figure 3). Another student created a presentation about the Loch Ness Monster. This student began his presentation by describing the monster and his habitat/location, and then built on his presentation by reporting on mysterious sightings, questioning whether information was a hoax, reporting theories surrounding the monster, and ending with a "video of the monster" and the student saying, "Is there a monster in the water?"

To receive full credit in the third domain, organization, students needed to show evidence of established text structure. All students met the criterion, with the two text structures of cause and effect and sequential presentation being represented in the projects. In a presentation about the mystery of crop

Figure 2. Sample Inquiry Method Templates (POSE)



Note. POSE adapted from POSSE by C. Englert & T. Mariage, 1991. Adapted with permission of the author.

circles a student reported the phenomena of crop circles by first defining crop circles, then looking at the history, theories, and causes of the circles. He ended his presentation with pictures of crop circles and challenged the audience to determine whether the crop circles were reported to be real or fake. Another student created a more sequential presentation on the invention of movies. She presented information that looked at the topic of movies by tracing the history of the movie camera. Her presentation began with references to the ancient art of shadow plays and ended with information about the modern camera and present-day movies.

The final domain, graphics and sound, reflected the students' creativity and ability to select graphics and sound that supported their inquiry projects. All students excelled in this domain.

Category	4	3	2	1
Inquiry process	Student/tutor dyad followed all required steps of the project (POSE, research, read, summarize, choose graphics, storyboard, create PowerPoint).	Student/tutor dyad followed all required steps of the project (POSE, research, read, summarize, choose graphics, storyboard, create PowerPoint) with one prompt from researcher.	Student/tutor dyad followed all required steps of the project (POSE, research, read, summarize, choose graphics, storyboard, create PowerPoint) with many prompts from researcher.	Student/tutor dyad followed few of required steps of the project (POSE, research, read, summarize, choose graphics, storyboard, create PowerPoint).
Focus on research question	The entire PowerPoint is related to the research question and allows the reader to understand much more about the topic.	Most of the Power- Point is related to the research question. The PowerPoint wanders off at one point, but the reader can still learn something about the topic.	Some of the Power- Point is related to the research question, but a reader does not learn much about the topic.	Little attempt has been made to relate the PowerPoint to the research question.
Organization	The PowerPoint is very well organized. Each idea or slide is arranged in a logical sequence with an identifiable text structure and clear transitions.	The PowerPoint is pretty well organized. Most ideas or slides are arranged in a logi- cal sequence with an identifiable text struc- ture and clear transi- tions. One idea or slide may seem out of place. Clear transitions are used.	The PowerPoint is a little hard to follow. The transitions are sometimes not clear and text structure is often not identifiable.	Ideas and slides seem to be randomly arranged.
Graphics and sound	Graphics and/or sound add to the reader's understanding of research topic.	Graphics and/or sound add to the reader's understanding of the research topic, except for one slide.	Some of graphics and/or sound add to some of the reader's understanding of the research topic.	None of the graphics and/or sound adds to the reader's under- standing of the research topic.

inquiry activities and apply reading

comprehension strategies. Furthermore,

the motivational aspect of the projects,

along with the accessibility and presen-

tation flexibility that the technologies

provide, support UDL principles for all

students. Flexibility of representation is

Table 1. Multimedia PowerPoint Inquiry Project Rubric

Benny's (not his real name) presentation about Bigfoot was noteworthy for the great deal of time he spent planning his presentation and picking out the pictures, sound effects, and graphics that would best support it (see Figure 4).

Final Thoughts

Engaging older students with RD in an inclusive classroom can be a daunting task for the special educator. It is clear from our observations that pairing reading assistance software with a multimedia project has the potential to allow students with RD to fully engage in principles, which can be beneficial to students with and without disabilities.

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Figure 3. Case Study: Greg

Greg was a 12-year-old articulate student who was interested in learning more about one of his favorite inventors, Thomas Edison. He knew about the inventor's later life, but not much about his early struggles. This is an example of one of the slides he created to depict the many jobs the inventor had before becoming famous. Greg's presentation was well organized and each slide included a title, text, and a picture to help convey information. Greg used the Google image search engine to find images for his slides.



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Figure 4. Case Study: Benny

One of our oldest students, 14-year-old Benny, was interested in mysterious phenomena and decided to research Bigfoot. His PowerPoint presentation included descriptions of the creature, legendary sightings, and theories surrounding the monster. Each slide included unique pictures and sound effects that added to the overall appeal of the project. He also recorded his own voice as narration for the slide show. Benny used the Google image search engine to find both photographs of Bigfoot and animated lightning graphics.



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