Delivery and Evaluation of Synchronous Online Reading Tutoring to Students At-Risk of Reading Failure

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Abstract

In a technological society, demands for higher literacy are ever increasing, creating grievous consequences for those who fail to meet these demands (National Research Council, 1998). Both legislative mandates, such as NCLB, and developments in the provision of reading instruction, such as RtI, have increased the demand for high quality tutoring services. However, the U.S. Department of Education (USDOE, 2005) and state officials (Richard, 2005) report that access to intensive supplemental tutoring may be limited in rural areas due to limited availability of qualified providers. One way to overcome this obstacle is to supplement classroom instruction with live systematic, comprehensive, and explicit online reading tutoring. The purpose of this manuscript is to describe and discuss a preliminary investigation of the effects of live online reading tutoring on 4th grade students in a high minority, high poverty school in Philadelphia, PA. Although this study was not conducted in a rural location, the implications are great for rural schools where qualified tutors may be nonexistent or inaccessible. Using a distance teleconferencing system, trained and supervised undergraduate students located at Utah State University delivered tutoring. The researchers employed a multiple-baseline across participants design to determine the effects of 1:1 online reading tutoring on reading fluency scores for 3 students. In addition, they compared data on tutors’ face-to-face and online tutoring behaviors. Data collected from parents, teachers, tutees, and tutors evaluating the effectiveness, efficiency, and feasibility of online tutoring for remediating students’ skill deficiencies are presented and discussed.

The ability to read accurately and fluently is a highly valued skill in any literate society. Upon entering school, many children learn to read without great difficulty; however, each year, a portion of children experience significant problems learning to read (Catts, Fey, Tomblin, & Zhang, 2002). Authors of the 2005 National Academy of Science’s report on Preventing Reading Difficulties in Young Children stated, “current difficulties in reading largely originate from rising demands for literacy, not from declining absolute literacy levels. In a technological society, the demands for higher literacy are ever increasing, creating more grievous consequences for those who fall short” (Snow, Burns, & Griffen, 1998, p. 1). Clearly, reading is essential to success in modern American society. Reading is required to execute critical tasks (e.g., reading instructions, reading magazines and newspapers, gaining access to literature, completing tax forms and paying bills, and accessing the internet) within school, home, and community environments. Lack of reading skills produces immediate functional deficits in response to environmental demands (e.g., driving, shopping, reading warning signs) but also produces long-term limitations for individuals in future, more complex and technical, environments (e.g., working with computers, ATMs, internet access).

In spite of decades of attention by educators and lawmakers, many students still struggle with reading. For example, the College Board recently released SAT test scores for the class of 2007, which reaffirmed the need for more support for our students. The class of 2007 SAT test-takers was the largest and most diverse to date. However, there was a continued decline in reading and math scores for the second consecutive year (Spellings, 2007). In 2007 the National Assessment of Educational Progress (NAEP) released the Nation’s Report Card indicating mixed results in reading performance. Despite recent attention to reading instruction, nationally, fourth graders’ average score in 2007 was only one point higher than 2005 (218 to 219 on a 500 point scale; NAEP, 2007). While recent aggregated NAEP scores show minimal positive growth, disaggregated data continue to show substantial performance differences across genders, ethnic/racial groups, and social classes (SES levels). For example, in 2007, NAEP scores for Caucasian and Asian students in the 4th grade averaged 26.7 points higher than for American Indian, Hispanic, and Black

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students. Fourth grade students eligible for free and reduced lunch score, on average, scored 27 points lower on reading assessments than students who did not qualify for free and reduced lunch. As a whole, these outcomes are alarming in light of data suggesting that students who are not proficient readers by fourth grade are not likely to become proficient adult readers (Campbell, Hombo, & Mazzeo, 2000).

Many reading researchers (e.g., Blackman 1996, 1997; Felton, 1993; Fletcher & Lyon, 1998; Torgesen, 1997) have argued that the vast majority of reading problems can be prevented through early identification and high quality research-based instruction. Lyon (2001) estimated that, through appropriate, explicit, comprehensive, and intensive early instruction, we can decrease the number of children experiencing reading failure by approximately two-thirds. In addition, through an extensive review of thousands of research studies, members of the National Reading Panel, (NRP, 2000), identified five critical elements of reading (i.e., phonemic awareness, phonics, fluency, vocabulary, reading comprehension) that, if attended to instructionally, may result in skill improvements for many children.

One reading program identified as effective is Corrective Reading (American Federation of Teachers [AFT], 1999). The design of this Direct Instruction (DI) program incorporates five main elements: (a) analysis of the content including identification of generalizable strategies to help students learn more efficiently, (b) instruction designed to minimize vagueness for students, (c) structured dialogue between the teacher and student, (d) skills taught in a sequential manner, and (e) organized instructional objectives to allow for systematic skill development throughout the programs (Watkins & Slocum, 2004). Within this framework, Corrective Reading aligns with the recommendations of the NRP and Put Reading First reports. The Corrective Reading program includes an explicit phonics based approach; sequential introduction to concepts and skills; systematic review of previously taught material; and fluency, vocabulary, and comprehension building (Stein & Kinder, 2004). Specifically, the Corrective Reading-Decoding series is a systematic, phonics program containing four levels (A, B1, B2, and C) which provides hierarchical skill development in reading for students in grades 3 through 12 (Engelmann, Carnine, & Johnson, 1999; Engelmann et al., 1999; Engelmann, Meyer, Johnson, & Carnine, 1999). Researchers have documented the effectiveness of the Corrective Reading-Decoding series with remedial readers (Campbell, 1988; Gregory, Hackney, & Gregory, 1982), non-categorical poor readers (Holdsworth, 1984-85; Kasendorf & McQuaid, 1987), and special education students (Thomson, 1992; Thorne, 1978).

Research also has supported the use of Corrective Reading through studies evaluating the curriculum's effect on students. For example, Schacter (1999) reported in Reading Programs that Work: A Review of Programs for Kindergarten to 4th Grade that Direct Instruction was among one of the most effective reading programs for children. In fact, Adams and Engelmann (1996) reported in their meta-analysis that the mean effect size across 43 studies was .69. Similarly, Building on the Best, Learning from What Works (AFT, 1999) reported a 3-year study in which a group of rural third grade students were instructed using Corrective Reading and compared to students not receiving DI. They reported an effect size of .61 in favor of the students who had received Corrective Reading when compared to the non-DI group (AFT, 1999).

The No Child Left Behind Act (NCLB, 2001) and the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) require teachers to use research-based practices and instructional arrangements in their classrooms (Odom et al., 2005). As students progress from grade to grade, curriculum demands vary along with classroom settings and teacher expectations (Haisley, Tell, & Andrews, 1981). This magnifies the need for educators to incorporate instructional arrangements to reduce the skill disparity between students.

Tutoring is one instructional arrangement that has been used extensively to increase student learning in elementary settings (e.g., Delquadri, Greenwood, Stretton, & Hall, 1983; Greenwood, Delquadri, & Hall, 1989; Greenwood et al., 1987; Johnson & Johnson, 1984; Maheady & Harper, 1987; Nelson, Johnson, & Marchand-Martella, 1996). Through the use of tutors, content may be individualized to allow students extensive opportunities to respond and receive feedback (Greenwood, Carta, & Kamps, 1990). In fact, Greenwood et al. (1987) suggested that opportunities for individual responding are higher during tutoring than during traditional classroom instruction. Moreover, tutoring might be used to increase students' engaged time during instructional activities when managing students is often difficult, such as independent practice. Providing more engaged time allows struggling students increased opportunities to cover the material within the curriculum which otherwise may be hampered due to classroom constraints and extended breaks from school.

When implementing a tutoring program, it is important that tutors are trained to engage in specific teaching behaviors. Marchand-Martella, Blakely, and Schaefer (2004) provided seven guidelines of what tutors should be trained to do during tutoring sessions: (a) begin tutoring when the session begins, (b) use clear instruction, (c) use explicit teaching methods, (d)
provide positive feedback for correct responses, (c) provide corrective feedback for incorrect responses, (f) provide several opportunities to respond to increase student engaged time, and (g) ignore undesired tutee behavior. Interestingly, these teaching behaviors align with those supported by the NRP, Put Reading First, and the DI reading and math curricula. Thus, the desired tutoring behaviors align well with the curriculum used in this study.

Barker, Gersten, and Keating (2000) assessed the effects of tutoring on reading accuracy, fluency, and comprehension of elementary students across 2 academic years. Tutoring sessions were 30 min. twice per week for 6 months during each academic year. The comparison group received typical classroom reading instruction. At the end of the 1st grade, the effect size for word identification was .42, oral reading fluency was .53, and passage comprehension was .43 when comparing the students who received tutoring to students who received the regular classroom reading instruction. At the end of the 2nd grade, the effect size for word identification was .44, oral reading fluency was .53, and passage comprehension was .32. Their results indicate that tutoring had an important educational influence on the tutees' reading skills. Along with the use of an evidence-based reading program, these results support the use of tutoring as an effective method for struggling students.

While several years of research supports the use of tutoring as an effective practice to teach reading, it may be difficult for some students to receive these services due to a lack of resources in certain rural areas. For example, the USDOE reported that only 226,000 out of 2 million students (8.9%) nationwide who qualified for supplemental tutoring services actually received those services (USDOE, 2005). It is difficult to see this outcome as anything but deplorable considering the potential for supplemental services through online tutoring. There are numerous advantages of using online delivery for tutoring. For example, the use of an online format allows the tutor to be flexible in instruction with regard to materials, delivery to geographic areas, and the time during which tutoring is delivered (Beth-Marom, Saporta, & Caspi, 2005). In addition, tutors do not have to exert resources (e.g., time and money) to commute to rural areas (Collins & Galyon Keramidas, 2006). Using online distance tutoring may be one way to meet students' needs in locations in which high quality tutoring is not available.

Synchronous online tutoring refers to 1:1 tutoring taking place in real time in which the tutor is physically distant from the student. Synchronous online tutoring may offer important advantages, including the following: (a) access to skilled tutors is extended beyond students' geographic boundaries; (b) online tutoring can be made available during school or outside of school hours; (c) online tutoring can be accessed from home, school, or other locations, potentially increasing access, and (d) online tutoring in the home may increase parent involvement by providing frequent updates and debriefing of each tutoring session.

Branzberg (2004) identified seven for-profit companies using synchronous and/or asynchronous online technology to deliver instruction. He found that there is little evidence about student outcomes or the extent to which services provide an effective research-based curriculum. Reported, each of these businesses provided some homework assistance (e.g., daily independent practice of math facts or reading assistance), and two programs provided tutoring services (e.g., use of company created curriculum). None of the companies offered synchronous audio/video delivery of curriculum with individualized instruction (Branzburg, 2004). None of the companies reported the use of research-based curriculum or had any empirical evidence to support their claims of being highly effective (Branzburg, 2004). In fact, all seven companies relied on client testimonials as the basis for making their claims. In addition, schools or parents also incurred a substantial cost to purchase these services—cost range from $35 to $140 per hr. (Branzburg, 2004). Thus, it appears that there is a need for additional research and development of systems to provide research-based online tutoring that is accessible and affordable.

Researchers have found that there is little difference between face-to-face and online instruction (Bernard et al., 2004; Meyer, 2002). Bernard et al. reported in their meta-analysis of distance education that face-to-face communication benefited students in synchronous distance education. They recommended that more research should be conducted in making online learning more accessible to learners located in rural areas and those with disabilities. In addition, they recommended that a comparison be made between students provided instruction face-to-face and students provided instruction at a distance.

Finally, the NRP (2000) argued that the effects of computer technology must be studied in partnership with the content in which the technology is delivering. Computer technology "is not a method in itself" (NRP, p. 17). Thus, it is imperative that any examination of technology should be examined in conjunction with the delivery of content through the technology system. Direct Instruction, a carefully sequenced method of instruction with over 25 years of research that support its efficacy for use with struggling readers, may be an effective method to use in an online environment because one element of Corrective Reading is clear, precise instructional delivery.
Given NCLB mandates along with recent national test results, there is a clear need for broad access to high quality supplemental reading instruction including individual tutoring. The lack of instructional resources in rural and inner city locations paired with time-intensive demands of teaching reading skills suggest that there is a strong need to examine alternative practices of providing supplemental reading services. Synchronous online tutoring is one promising method for increasing access to these services. The purpose of this study was to evaluate the effect of online reading tutoring for at-risk 4th grade students’ reading skills as measured by the DIBELS oral reading fluency probes. In addition, we also wanted to identify the extent to which tutors’ direct instruction observation checklist scores collected from online and face-to-face instructional sessions compare across multiple dimensions (i.e., cue, pause, signal, response error correction, instructional pace, praise rate). Last, we wanted to find out the students’, tutors’, teachers’, and school administrators’ perceptions of the effectiveness and desirability of online tutoring.

Method

Participants and Setting

This study included 3 fourth grade African American students and 4 undergraduate college tutors as participants. The researchers used three criteria to select student participants. First, their classroom teacher identified students needing reading intervention. Second, confirming the need for reading intervention, students were required to score below the 20th percentile on the state reading achievement test; finally, students responded to a Corrective Reading placement test. The researchers invited students who placed in the same Corrective Reading curriculum level and the other selection criteria to be participants in this study. School personnel identified the elementary school students selected as participants for this study as scoring below the 20th percentile on state reading achievement tests, and they placed similarly in the Corrective Reading curriculum. The placement test ensured that students were grouped in a relatively homogeneous decoding ability. The researchers recruited tutors from Utah State University’s (USU) preservice teacher program and taught them to deliver 1:1 online assessments and online tutoring. Tutors were female undergraduates with 2 years experience delivering Direct Instruction. Tutors received ongoing supervision in the delivery of key assessments and teaching behaviors.

The researchers conducted this study in two settings: (a) USU’s Center for Academic Interventions tutoring lab and (b) a computer lab at an inner city elementary school in Philadelphia, PA. The USU distance-tutoring lab was equipped with high-speed Internet capabilities, and each computer tutoring station contained a web camera and voice over IP phone with headset. The Philadelphia Elementary School was equipped with high-speed Internet capabilities, and each tutoring station contained a web camera, phone with headset, landline phone connection, desktop microphone, and electronic writing board.

After distance-tutoring participants were identified, the online delivery system was set up in the elementary school site and participants were administered three assessments (i.e., Woodcock-Johnson III, DIBLES, and Placement Test). Previous research by the authors on assessing students over an online system with the Woodcock-Johnson III (WJ-III) indicated that assessments can be delivered over an online system with as valid outcomes as traditional face-to-face delivery (see Forbush et al., 2007). The 3 participants’ scores are reported in Table 1. All 3 students’ scores were below the 20th percentile on the three subtests delivered from the WJ-III.

Table 1.

| Participants’ Scores: Woodcock-Johnson-III Tests of Academic Achievement |
|-----------------------------|----------------|-------------|-------------|
| Student | Letter | Word ID | Word Attack | Picture Vocabulary | Mean |
| 1 | 18 | 10 | 33 | 20.3 |
| 2 | 7 | 10 | 1 | 6 |
| 3 | 26 | 33 | 40 | 33 |

Note: Scores represent percentile scores

Apparatus

Adobe Connect Internet Protocol Video software was used to allow tutors and students to see one another and to work with instructional materials. Adobe Connect’s capabilities included real-time communication (i.e., audio, video, use of virtual whiteboard for presentation of curriculum) and document sharing within the virtual tutoring room. The writing tablet allowed users to write on documents digitally. This enabled tutees to complete written work and allowed tutors to monitor and give feedback to students on their workbook activities in real time. (See Figure 1 for a screenshot of Adobe Connect as used in this investigation.)

Measures

The primary dependent variable was students’ oral
reading fluency, measured with the Oral Reading Fluency (ORF) subtest of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; http://dibels.uoregon.edu/) reading battery. Good, Simmons, and Kame'enui (2001) provide a complete description of the DIBELS-ORF assessment, an individually administered test of accuracy and fluency with connected text. Each student performs a series of 1-min. readings on three different passages. All words accurately read within 1 min. were counted as correct. Errors included words omitted, substitutions, and hesitations of more than 3 s. Words self-corrected within 3 s were scored as accurate. Each day's score was the median correct words per min. from the three passages.

Table 2.

<table>
<thead>
<tr>
<th>Tutor</th>
<th>Face-to Face</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>100%</td>
<td>89.25%</td>
</tr>
<tr>
<td>3</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>(M)</td>
<td>100%</td>
<td>96.4%</td>
</tr>
</tbody>
</table>

Note: Scores represent percent items given correctly based on the DIBELS integrity checklist.

Reliability

Before data collection began, test administrators, primary observers, and interobserver agreement (IOA) observers received training. The researchers electronically archived all distance tutoring and testing sessions for purposes of data collection and IOA observations. The researchers observed 30% of all archived distance-tutoring sessions in real time and scored them to assess treatment integrity. Table 2 shows a comparison of the consistency in the accuracy of delivery of face-to-face and online delivery of DIBELS oral reading fluency probes. Across both conditions (i.e., face-to-face and online), undergraduate tutors delivered ORF probes consistently and reliably.

Thirty five percent of treatment integrity observations included a second observer to establish IOA. The treatment integrity protocol consisted of specific behaviors identified as critical behaviors from DIBELS authors. Given each critical behavior was observed by independent observers, a check mark was made next to the appropriate definition. Overall, IOA for delivering ORF probes online was 91.1% with a range of 76% to 100% Face-to-face IOA for the DIBELS was 97.1%, ranging from 82% to 100%. Importantly, the difference in scores may have been
due to technological problems. During this pilot study, the researchers had instances of “dropped packets,” defined as losing data from the audio stream.

The researchers also assessed IOA on 35% of DIBELS-ORF probes and included a second observer to establish reliability between the tutor and an independent observer. Overall, IOA for ORF probes was 94.3% with a range of 81% to 100%.

**Experimental Design and Conditions**

The researchers used a multiple baseline across subjects design to determine the extent to which online tutoring increased oral reading fluency for fourth-grade participants. During baseline condition, assigned tutors administered DIBELS oral reading fluency progress monitoring probes to each participant two times weekly. Throughout the study, participants continued to receive reading instruction from their general education teachers. For each participant, tutors collected a minimum of three data points in baseline condition prior to implementing online tutoring. The tutors were responsible for delivering the DIBELS probes and collecting the words read correctly and incorrectly per min. Prior to implementing online tutoring for each participant, the researchers visually inspected the data trend of the oral reading fluency probes to determine if data patterns were stable and predictable, establishing an effective baseline and context for observing the effect of online tutoring on students’ oral reading fluency. Tutors initiated online tutoring with one participant at a time, with other participants’ oral reading probes serving as controls to identify the presence of extraneous variables acting upon students’ oral reading fluency. After the intervention was applied with the first student, and baseline data for the other participants remained stable, and the pattern of data for the student receiving online tutoring was stable and predictable; then, the intervention, or one-on-one tutoring, was introduced with the second participant and so on.

**Intervention**

Each online tutoring session consisted of five steps. First, tutors and tutees discussed the average words read daily at home to establish rapport. Second, to measure changes in reading skills, tutors assessed tutees’ oral reading fluency using the DIBELS progress monitoring assessment. Third, tutors provided reading instruction to tutees at each student’s predetermined reading level. For this study, using the Corrective Reading placement test, all students placed in level B1 of the Corrective Reading program. Fourth, tutors worked with tutees to complete other Corrective Reading program related activities including workbook, spelling checks, and read to write comprehension checks relating to connected text from lesson readings. Fifth, tutors conducted comprehension checks at the end of each reading lesson. The approximate duration for each tutoring session was 50 min.

During online tutoring via Adobe Connect, the tutors used Corrective Reading Direct Instruction materials in PDF/Flash Paper format, video via a web camera, and audio through a voice over Internet protocol service to deliver instruction. Tutors collected data from tutees’ responses to oral questions, reading connected text, producing isolated sounds, sound blends, responses to comprehension questions, completed written practice exercises, reading text online, and responses to fluency building activities. Face-to-face tutoring sessions were identical to online tutoring sessions except they were delivered in person. Researchers compared data collected from face-to-face tutoring sessions to the data collected in the online tutoring sessions to determine the extent to which tutors’ behaviors matched across conditions.

**Results**

The results (presented in Figure 2) display the effects of online reading instruction on the oral reading fluency for 3 participants. Overall, supplemental reading instruction in an online format led to a marked increase in the participants’ oral reading fluency. For Subject 1, the number of correct words read per min. (CWRPM) during baseline ranged from 19 to 36, with a mean of 26.25. In contrast, the mean number of CWRPM during the intervention phase was 41.50 with a range of 20 to 59.

In addition, the percent of non-overlapping data points (PND) was 66% for Subject 1. During baseline condition, the number of CWRPM made by Subject 2 ranged from 31 to 65 with a mean of 50.75. During the intervention phase, the mean number of CWRPM was 58.45 with a PND of 36%. For Subject 3, the number of CWRPM during baseline condition ranged from 34 to 65 with a mean of 56.82. The mean number of correct words read per min. during the intervention phase was 64.57 with a range of 63 to 75.

Tables 3, 4, and 5 display the extent to which tutors’ direct instruction observation checklist scores collected from online and face-to-face instructional sessions compared across multiple dimensions (i.e., cue, pause, signal, response error correction, instructional pace, praise rate).

Table 3 displays the tutor presentation characteristics. Across both online and face-to-face instructional settings, all 3 tutors had a 100% match on the discrete behaviors’ cue, pause, and signal. Interobserver agreement for these three behaviors was 100% across all 3 tutors. Table 4 displays the teacher error correction procedures across both online and face-to-face settings.
Improvement Trends for Oral Reading Fluency related to online tutoring for three 4th grade students at-risk of reading failure.

Table 3.

Tutor Presentation Characteristics—Direct Instruction Observation Checklist

<table>
<thead>
<tr>
<th>Tutor</th>
<th>Cue Online</th>
<th>FtF</th>
<th>Pause Online</th>
<th>FtF</th>
<th>Signal Online</th>
<th>FtF</th>
<th>Mean Online</th>
<th>FtF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>4</td>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

M 100 100 100 100 100 100 100 100

Note: FtF=Face-to-face; Scores represent percent correct; IOA=100%
Table 4.

Teacher Correction Sequence—Direct Instruction Observation Form

<table>
<thead>
<tr>
<th>Tutor</th>
<th>Online</th>
<th>FtF</th>
<th>Online</th>
<th>FtF</th>
<th>Online</th>
<th>FtF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/O</td>
<td>87.5</td>
<td>N/O</td>
<td>87.5</td>
<td>N/O</td>
<td>87.5</td>
</tr>
<tr>
<td>2</td>
<td>87.5</td>
<td>96.6</td>
<td>87.5</td>
<td>96.6</td>
<td>87.5</td>
<td>97.7</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>66</td>
<td>80</td>
<td>66</td>
<td>80</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>100</td>
<td>97</td>
<td>100</td>
<td>98.5</td>
<td>100</td>
</tr>
</tbody>
</table>

\[ M = 89.2\] 87.5 88.2 87.5 88.67 87.8

*Note: FtF=Face-to-face; Scores represent percent correct; IOA=86%*

Table 5.

Teacher Praise—Direct Instruction Observation Form

<table>
<thead>
<tr>
<th>Tutor</th>
<th>Specific Praise</th>
<th>General Praise</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Online</td>
<td>FtF</td>
<td>Online</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>3.5</td>
<td>2.5</td>
</tr>
<tr>
<td>3</td>
<td>.3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>2.3</td>
<td>1</td>
<td>5.6</td>
</tr>
</tbody>
</table>

\[ M = 2.15\] 1.87 3.4 3.43 2.78 2.65

*Note: FtF= Face-to-face; Scores represent responses per minute; IOA=96%*

Tutor 1 had no opportunities during online observations to deliver a model or test since the tutee did not make any errors. However, in face-to-face sessions, she delivered 87.5% of the models and tests correctly.

Tutor 2 delivered appropriate error correction procedures 87.5% of the time online and 96.6% of the time face-to-face. Tutor 3 correctly gave error correction 80% of the time online and 66% of the time face-to-face. Tutor 4 correctly gave error correction 98.5% online and 100% face-to-face.

Table 5 displays the rate of reinforcement from each tutor during both online and face-to-face conditions. Researchers observed and recorded both specific academic reinforcement and general praise for purposes of supervised feedback. The overall rate of praise delivered by tutors online was 2.78 times per min. (range 1.15-3.95). The overall rate of praise delivered face-to-face 2.68 times per min. (range 1.80-3.25). Online, specific academic praise ranged from .3 to 4 praise statements per min., and the mean was 2.15. Face-to-face, specific academic praise ranged from 1 to 3.5 with a mean of 1.87. Online, general praise ranged from 2 to 5.6 with a mean of 3.40. Face-to-face general praise averaged 3.43 and ranged from 2.6 to 4.6.

**Discussion**

The USDOE reported that only 226,000 out of 2 million students (8.9%) nationwide who qualified for supplemental tutoring services actually received those services (USDOE, 2005). One way to provide these supplemental tutoring services is to enhance classroom instruction with live systematic, comprehensive, and explicit online reading tutoring. There are several implications for students who receive online tutoring. First, rural locations can gain access to trained and supervised tutors who deliver scientifically proven methods of instruction. Second, approximate reading strengths and needs can be gauged by delivering assessments online. Third, students receive one-on-one high paced instruction. Fourth, intensive practice and error correction is delivered as 1 to 2 program lessons delivered in a 50 min. period. Fifth, students are able to build relationships around reading with college-aged
students, and, in turn, pre-service teachers gain real world teaching experience. Sixth, parents, students, administrators, and tutors self report that the interaction across a distance delivery system is positive, and students make gains in reading. Last, tutors are instructed in delivering research-based instruction, supervised, and given feedback on performance, and all instructional decisions are derived from ongoing assessment of student skills.

The implications for schools are also numerous. With a collaborative effort, universities are able to deliver reduced-cost tutoring to public school students. This tutoring is perhaps less expensive than it would cost to hire tutors locally and train them to deliver instruction. In addition, public schools are gaining access to trained and supervised tutors who can deliver Tier 2 and 3 RtI interventions. As with all types of interventions, there is an expense the school must incur. The technology needed is an upfront cost schools or parents must provide, as well as monthly Internet fees. For some parents, the cost of technology and Internet connection may be too much. However, some parents report in-home, online tutoring allows them greater flexibility and convenience in addressing their students’ needs. Rather than taking their students to a central location to get tutoring, they can simply turn on their computer and tutoring is delivered to their home office. In addition, parents no longer need to pay for other miscellaneous costs associated with face-to-face tutoring (e.g., automobile fuel, time, babysitter). Online tutoring increases parents’ and teachers’ involvement in reading interventions by providing them access and weekly updates of student progress. In a typical online home tutoring session, tutors will debrief the parents at the end of the lesson to share data and inform the parents on how the tutoring session went.

Several obstacles were encountered in this pilot study. The first and most vexing was the absence of physical proximity of tutors and tutees and the impact this lack of proximity exerted toward initiating and sustaining instructional control. It became clear that managing a student’s learning behavior who is 3000 miles away may be difficult and cannot be accomplished without physical proximity. Managing student behavior was addressed in several ways. First, we used high quality, high paced instruction with several opportunities for student responding, reinforcement, and error correction. Second, we used a “you/me” game to manage behavior utilizing a token economy. Tutors allowed students 5 min. after each tutoring session to play a game or listen to music contingent on obtaining more points than the teacher. Third, prior to each tutoring session, tutors gave students explicit instruction on appropriate tutoring behaviors. For example, a tutor might have told a student to adjust the camera for full viewing, to “Park the mouse” or place the mouse behind the monitor, or to sit up tall with hands in lap. Given that the students responded quickly and appropriately, the tutors delivered appropriate reinforcement.

The second obstacle faced was the quality of sound. When delivering any type of instruction, clear sound is essential to discriminate the discrete sounds students make when learning to read. The researchers found that any background noise (e.g., teacher delivering instruction, other computers, hallway noise) would degrade the sound picked up from the microphone. One way to solve the sound issue was to use noise-canceling headsets. In addition to microphone sensitivity, tutees found it hard to hear on their end using only a single ear headset. The researchers found that a dual ear headset with a noise-canceling microphone was the solution for clear sound both on the tutors’ end and tutees’ end. It is important to note that tutors did not use the audio capabilities included in the Adobe Connect environment. They used a voice over Internet protocol (VOIP) system in place of Adobe Connect audio capabilities to avoid dropped voice packets. The combination of video and audio through Adobe Connect created a restriction in computer processing and Internet bandwidth usage. The use of VOIP alleviated the computer processing and bandwidth restriction by splitting the computer processing demands into two systems (i.e., VOIP and PC).

The third obstacle was voice tone and volume. Occasionally, a tutored student was shy and did not talk with strong tone or volume. In this case, the researchers already had the appropriate microphone and headset. The next step was to shape the student to speak with stronger tone or increased volume. This was done by modeling appropriate tone and volume. After tutors modeled the correct response, they asked the student to respond until they were able to get appropriate levels of volume and tone. The tutor used speech exercises with this student prior to each tutoring session to make sure the student could be heard clearly.

Fourth, the transition from face-to-face tutoring to online tutoring was difficult for inexperienced tutors. The Adobe Connect environment is fairly user-friendly. However, the setup is different when compared to a face-to-face session. Tutors have to manipulate the screen environment rather than turn a page to deliver the appropriate student stimuli. Further, tutors only see what is on a camera. Identifying discrete behaviors that could lead to problems are difficult to see if the tutor is busy manipulating the student’s stimuli and providing reinforcement or error correction for student responses. Tutors reported a high learning curve since the virtual environment was so different. However, when looking at the tutoring behaviors...
online and face-to-face, overall rates of reinforcement, error correction, and instructional pace were similar across both conditions. Tutors who were well trained in delivering the direct instruction had fewer problems transitioning to online tutoring than those who had never been trained previously in DI. Another technique used to smooth the administration of tutoring was to develop procedures for the beginning and ending of each tutoring session. This allowed tutors to follow the same procedures each session and eased transitions from assessment to instruction.

The fifth and final obstacle the researchers encountered was the visual clarity of stimuli used. They had to scan materials into a PDF format and convert those files into a flash paper format. The compression of original scans yielded poor results as the compressed file also compressed the text, making it difficult to see. One way to get around this obstacle was to enlarge the original PDF file and then convert the file. Once tutors were able to enlarge the original high quality scan and then convert it to flash paper, students were able to see the text clearly.

Future researchers should take advantage of technological developments to explore other methods for delivering tutoring services to students in need living in rural areas. Additional research also needs to be done in online instructional arrangements to determine evidence-based practices of managing student behavior. Finally, a comparison should be made to determine the efficacy of delivering instruction through an online system versus a traditional classroom setting.

References


