READING FLUENCY THROUGH ALTERNATIVE TEXT: REREADING WITH AN INTERACTIVE SING-TO-READ PROGRAM EMBEDDED WITHIN A MIDDLE SCHOOL MUSIC CLASSROOM

By

MARIE C. BIGGS* NANCY A. WATKINS**

ABSTRACT

Singing exaggerates the language of reading. The students find their voices in the rhythm and bounce of language by using music as an alternative technological approach to reading. A concurrent mixed methods study was conducted to investigate the use of an interactive sing-to-read program Tune Into Reading (Electronic Learning Products, 2006) embedded within a heterogeneous music classroom. Measured by the Qualitative Reading Inventory-4 (QRI-4) (Leslie & Caldwell, 2006), the fluency, word recognition, comprehension, and instructional reading level of the treatment students n=32 were compared to their counterparts n=32 who sang as part of the regular music program. Concurrently, this investigation also provided a description of the peers' interactions during the literacy tasks assigned by the music teacher.

The study findings indicated that the middle school students of varying reading levels significantly improved in their reading scores through the use of this technological approach. Students using the interactive sing-to-read program Tune Into Reading significantly outscored their counterparts who were rereading through singing in the regular music classroom. Furthermore, the use of the interactive program provided opportunities for differentiated reading level achievement. This in turn highly influenced the early adolescent's motivation, engagement, participation, and successful outcomes in reading fluency.

Keywords: Singing, Technology, Reading Fluency, Early Adolescents, Alternative Text, Middle School, Embedded Literacy, Reading Prosody, Qualitative Reading Inventory-4 (QRI-4).

INTRODUCTION

Prominent in educational discourse is understanding and meeting the unique and differentiated needs of the early adolescent literacy learner. This is extremely important as these students prepare to meet the challenges of living in an informational age as fluent, active, and independent readers (Alvermann, 2002; Guthrie & Wigfield, 2000; Kamil, 2002). Early adolescence, typically defined as ages 10-14 (middle school years), is a time of transition and rapid change in the students' emotional, social, physical, and cognitive development (Cottle, 2001; Moje, Young, Readence, & Moore, 2000; Pikulski, 1991). However, less than a decade ago, this population of learners suffered from scant attention to their literacy learning as "policy makers, curriculum developers, and school leaders rallied to address the literacy needs of students in grades K-3" (Elish-Piper & Tatum, 2006, p. 6). As a result, this placed the specialized literacy needs of the early adolescent at a disadvantage, as these students navigate their literacy learning across various content areas and through diverse and alternative texts, it should not be assumed that they are fluent readers and comprehenders who are prepared to meet the challenges of the new millennium.

The field of reading has moved far beyond the view that literacy is the ability to read and write across various content areas alone (Bean, 2000). Instead, the concept of content reading has been broadened to reflect the integration of communication processes (reading, writing, talking, listening, and viewing) as the students engage in text-related learning (Alfassi, 2004; Lenz & Deshler, 2003; Vacca & Vacca, 2002). There is an assumption that the one-dimensional linear textbook is necessary for teaching and learning the content

specifics (Wade & Moje, 2000).

Further to complicate this contextual dilemma, middle school content teachers have resisted the recommendation to incorporate literacy-related instruction into their curricula (Phelps, 2005).

Bulgren, Schumaker, Deshler, Lenz, and Marquis (2002) report, content teachers feel that they do not have the time or experience to include explicit literacy instruction into an already crowded curricula. This may be a result of deeply embedded values, beliefs, and practices, and the need to conform to stringent standards (e.g. high-stakes testing) imposed by the No Child Left Behind Act of 2002 (NCLB) (O'Brien, Stewart, & Moje, 1995).

In this era of standards-based reform, imposed by NCLB, the results of one high-stakes assessment can have a dramatic impact on the early adolescent literacy learner with the possibility of retention, class placement, and specifically, instructional practices provided to the students. The scores obtained from the *Florida Comprehensive Assessment Test* (FCAT), place the early adolescents below level (FCAT 1 and 2), at level (FCAT 3), or above level (FCAT 4 and 5) their classmates in reading. It is assumed that the early adolescent students who may or may not have passed the test will receive the instructional strategies needed to prepare them to be fluent readers and comprehenders.

In addition, there needs to be an appreciation of the social-cultural influences that shape instructional practices for these literacy learners (Phelps, 2005). Ryan (2000) reports "peer interactions consume significantly more time in adolescence compared to childhood" (p. 107). These interactions with peers can concern both academic (e.g., achievement) and non-academic matters (e.g., engagement, motivation, self-efficacy, and interest). Ryan (2000) suggests, there are generally three ways that early adolescents experience peer interactions within the context of middle school: through information exchange, modeling, and peer pressure. These are the assumptions that influence instructional delivery and perceptions of fluent, active, and independent readers (Alvermann, 2002). However, Phelps (2005) reports, alternative texts that focus on new literacies through digital media have had a great influence on the early adolescent's instructional practices and social interactions.

A meta-analysis to investigate experimental and quasi-experimental studies over the last decade in literacy and technology, of the effects of technology and reading for middle school learners was conducted by Pearson, Ferdig, Blomeyer, and Moran (2005). Pearson et al, found little experimental research for reading and technology use in the middle grades. The researchers acknowledge that even though the empirical knowledge is weak, there are many excellent theoretical arguments grounded in best practice. Many offer compelling cases that support the use of technology to enhance literacy learning.

The computer offers students more control in terms of support, pace, and active processing of text (Kamil, 2002). The use of technology as an alternative text links real world experiences and interests, and provides opportunities for alternative text reading with the early adolescent literacy learner. Leu (2000) reports on the positive effects for middle school readers when print and visual texts (e.g., hypermedia, the internet, and interactive CD-ROMS) are utilized. Reading diverse texts across and within various content areas can be further complicated if early adolescent students do not have the background knowledge, experiences, and strategies for reading a variety of texts fluently.

Fluency is a necessary aspect of successful reading as it allows readers to read with speed, accuracy, and proper expression (National Reading Panel, 2000; Rasinski, 2004). The assumption is often made that early adolescents are at a satisfactory level of fluency in reading. However, Alexander (1998) believes this is extremely difficult for early adolescents because their cognitive strategic processes in reading are very diverse and are under continual development. Even though early adolescents are situated within a particular developmental stage, their cognitive abilities in reading vary with the different literacy tasks presented. Jetton and Alexander (2000) suggest, early adolescent readers' use of text comprehension strategies range across a developmental continuum,

and there is interplay of prior knowledge, experience, and strategic processes. Therefore, an adolescent reader may be a competent fluent reader in one literacy task and yet fall back and need support in another task. Rasinski (2004) points out the need to connect accuracy and automaticity to reading prosody in order to be reading fluently.

Reading prosody is the music of reading. It is the prosodic elements in reading fluency that connects fluent decoding directly to comprehension (Rasinski, 2004). The prosody components of reading fluency address the use of phrasing and expression (Dowhower, 1991; Schreiber, 1991; Schreiber & Read, 1980). When readers adjust appropriate volume, tone, emphasis, phrasing, and other elements while reading aloud, they are providing evidence of comprehending text (Rasinski, 2004). In this sense the rhythmic bounce of prosodic reading fluency entwined with accurate and automatic decoding is a multifaceted event with reading comprehension as the goal.

Samuels (1979) defines repeated reading as a fluency-building strategy that consists of timed rereading of a short passage several times (at least 3 times), checking for accuracy (word recognition), automaticity (words per minute) and with prosody (expression). Repeated reading is most authentic when the practiced material is eventually performed orally, such as plays, poetry recitation, or in this study singing lyrics to songs (Rasinki, 2004; Stayter & Allington, 1991). This form of repeated exposure through singing assists the reader with fluency through prosodic reading. The reader uses appropriate volume, rhythm, pitch, tone and phrasing (prosody), while singing the song lyrics, and therefore, they give evidence of actively constructing meaning from the passage (Rasinki, 2004). In other words, singing exaggerates the language of reading and can promote reading fluency and comprehension that can be naturally embedded within the music content classroom.

Butzlaff (2000) contends that there are similar characteristics with singing instruction and the reading process: (a) music text and written text involve formal written notations that are read left to right, (b) the sensitivity to phonological distinctions and word recognition requires a sensitivity to pitch and tonal distinctions in both reading and singing, (c) when students learn the lyrics to songs they are engaging in reading, and (d) learning song lyrics is often repetitive, so that rereading of text occurs through singing. In addition, Hall, Boone, Grashel, and Watkins (1997) suggest that students should sing independently, on pitch, and with rhythm. While most singing in the music classroom is done in groups, minimal time is spent with students singing individually. However, singing in the music classroom is usually performed as a whole group with one song and one group text. The use of an individual computer program could address these concerns.

Individualized computer assisted training in the music classroom is a recent additional tool teachers can employ for students to learn to sing and acquire songs individually. In a study analyzing 150 empirical articles on computer applications in music learning, Webster (2002) reported generally positive results with singing performance and pitch accuracy; however, studies on song acquisition with software for students in the middle school setting are sparse, especially studies relating singing to reading. One report on the computer program *Carry-A-Tune* (Electronic Learning Products, 2004) currently referred to as *Tune Into Reading* is in publication to date. This was a pilot study to examine the use of the sing-to-read software program with remedial reading middle school students (Biggs, Homan, Dedrick, Minick, & Rasinski, 2008).

Tune Into Reading, has several unique features that can be used to meet the specialized needs of literacy learners. Students use an individual soundproof microphoned headset for listening, singing, and recording. The program provides real time pitch recognition and feedback to the user. The inclusion of pitch recognition is important because Lamb and Gregory (1993) found that pitch discrimination is significantly correlated (.77) with reading ability. The scoring mechanism (pitch accuracy scores 0-100) accommodates each individual's vocal range, and contains a portfolio sign-in menu that aligns with the

custom vocal range of each participant. In addition, the program provides individual folders for each participant. As soon as the participant sign into the program and clicks on the My Lesson folder they have access to the songs that are at their instructional reading level. Also, *Tune Into Reading* has over 200 hundred songs, analyzed for readability levels from first to tenth grade readability levels. This wide range of available reading levels will provide opportunities for the students to build fluency through repeated reading by singing songs at their individual instructional reading level.

To summarize, a majority of early adolescents need opportunities and instructional support to read varied and diverse materials in order to build their experiences, fluency, and range as readers (Kuhn & Stahl, 2003). Literacy learning should take into account developmental issues, as well as thoughtful and critical literacy expressions that embrace the multiple literacies that these students bring to school within and across various content areas (Kamil, 2002). The problem is that little is known about this population of literacy learners and about how to provide literacy instruction that will address this change while, at the same time, providing support for their social and academic needs (Alvermann & Phelps, 2005). In order to gain a perspective on the impact that these assumptions have on middle school readers, it was appropriate to examine these students within a music classroom, to investigate singing as a form of repeated reading to improve fluency. This study investigated a population of middle school students who are in a music classroom as part of their assigned yearly elective cycle. Examining this sample will provide better insights into the area lacking in the available literature, the possibility of providing effective literacy instruction through alternative technological text embedded in music content area instruction.

1. Research Questions

The intent of the study was to address the following research questions:

1.1 Quantitative Research Questions

1. To what extent is the reading performance of word recognition, fluency, comprehension, and instructional reading level, as measured by the QRI-4, of students using the *Tune Into Reading* program different from their regular music curriculum counterparts?
2. To what extent does the *Tune Into Reading* program differently impact the reading scores of students who are "below, at, or above" grade level as determined by the Florida Comprehensive Assessment Test (FCAT) reading scores?

1.2 Qualitative Research Question

1. How do middle school readers interact with their peers, within the context of their music classroom?

2. Methods

This study used a concurrent mixed methods design consisting of two distinct phases (Creswell, Plano Clark, Guttman, & Hanson, 2003; Tashakkori & Teddlie, 2003). The quantitative numeric data and qualitative text data were collected and analyzed concurrently. The questions in the quantitative phase were answered utilizing a quasi-experimental design. The statistical technique used to answer these questions was analysis of variance (ANOVA) with repeated measures to assess differences in mean trend lines over time between the experimental and control group. The question in the qualitative phase used an interpretive case study approach, with the data collection occurring through participant observation. Inductive analyses were conducted to identify conceptual themes or patterns in the data, and create categories needed (Bogdan & Biklen, 2003; Cohen, Manion, & Morrison, 2000; Merriam, 2001). Priority was given to the quantitative approach because it looked at the statistical relationship between rereading through singing of the participants who used the sing-to-read program *Tune Into Reading* and their counterparts in the regular music class. The mixing of the data occurred during the qualitative findings section of the research project. Applying a triangulation strategy in order to provide a clearer picture and answer the research questions.

2.1 Participants

A total of 64 students ages 12 to14, treatment (n=32) and control (n=32), participated in this study. The sampling choice for this study was that of convenience. All of the study participants volunteered, were from the same school site, attended the same music class, and had the same music teacher. To qualify for inclusion in the study, students were in grades 7 and 8 and were a part of the elective Wheel Music Class during the fourth quarter of the 2006-2007 school year. Participants were randomly assigned to treatment or control conditions by classes.

Table 1 presents the classification characteristics of both treatment and control groups.

A cursory examination of Table 1 appears to suggest that that the groups are predominantly White low SES males in the 8th grade. Chi-square tests at an alpha level of .05 were used to analyze differences in the students' characteristics. The results indicated that the proportions of classification characteristics do not differ significantly across groups, reported as: (a) gender, $x^2(1) = 0.0656$, $p = .7978$, (b) grade level, $x^2(1) = 0.0709$, $p = .7901$, (c) ethnicity, $x^2(1) = 0.2196$, $p = .6393$, and (d) SES, $x^2(1) = 0.0801$, $p = .7772$.

2.2 Instrumentation

The Qualitative Reading Inventory-4 (QRI-4) Leslie and Caldwell (2006) is an informal reading inventory that provides grade level word lists, and narrative and expository passages for pre-primary through high-school reading levels. In this study it was used as a pre and post measure for the treatment group using *Tune Into Reading* compared to the control group singing in the regular music class. The purpose was to determine: (a) reading fluency, (b) accuracy of oral reading word recognition, (c) reading comprehension, and (d) an instructional reading level by combining word recognition and comprehension level scores.

Group	Gender		Grade Level		Ethnicity			ESE	ELL	SES	
	Male	Female	7	8	White	Black	Hispanic			Low	High
Treatment (n=32)	63%	37%	34%	66%	81%	6%	13%	6%	3%	72%	28%
Control (n=32)	59%	41%	32%	68%	78%	9%	13%	6%	3%	75%	25%

Table 1. Students' Classification Variables Percentages by Treatment and Control

The authors contend that this instrument has extensive piloting with approximately n=1,000 at multiple grade levels and the reliability of the QRI-4 measured consistency of scores in three ways: (a) inter-scorer reliability (.98), (b) internal consistency reliability (.98) for reading comprehension, and (c) alternate-form reliability (were all above .80 %). In addition, content-validity was evaluated in a systematic manner that reflected research findings as well as classroom practice, along with criterion-related validity measured by comparing students' instructional level based on the QRI-4 with students' equivalent scores on standardized reading tests.

To determine a base-line to start this assessment the authors recommend to use either the graded word list provided in this assessment or any extant data, which approximates their reading level. In this study the *Florida Comprehensive Assessment Test* (FCAT), reading level scores were used to approximate the appropriate beginning reading levels for assessment. FCAT level reading scores range from highest score (level 5) to lowest score (level 1). The scores for the treatment and control groups were stratified according to their FCAT level as: (a) Level 4 and 5 above grade level, (b) Level 3 at grade level, and (c) Level 1 and 2 below grade level.

2.3 Reliability Measures

In this study, the Kuder Richardson 20 (KR20) (1937) was used to assess the test's internal consistency. The alpha was computed for internal consistency. The raw coefficients for each of these variables were .75, .72, and .70 respectively. In addition to internal consistency, interrater reliability was used to address consistency of scoring of test items. A stratified random sample of 20 students (10 treatment and 10 control), at pre-test and post-test were double-scored. Two Pearson correlation coefficients were calculated on two of the dependent variables of this study, fluency and word recognition. The fluency scores and the word recognition scores were both highly correlated r=.999. The correlation results for word recognition also showed a strong relationship that was significant r = .943.

2.4 Procedures

The study was a seven-week treatment and sessions were twice a week for forty-five minutes per session. Using an overhead projector the music teacher presented the *Tune Into Reading* program to the whole group of treatment students. She went over all the components of the program, showing the students: (a) how to sign-in, (b) how to determine their vocal range, (c) how to use the two different textual formats, (d) how many times to listen to the song and reread silently, (e) how many times to record their singing, (f) how to interpret their scores and how this represents the accuracy of matching the pitch of the song while singing and recording, and finally (g) how to access their individual folder that contained the songs they would work with for each week.

The same music teacher worked with the control students for seven weeks, two sessions a week, for 45 minutes per session. The students during this seven-week study learned three songs with multiple stanzas, while learning and individually playing simple drum rhythms to accompany their singing. It was noted that "Drumming provides a rhythmic background that supports the student while learning a song" (March 26, 2007).

3. Data Collection and Analysis

Quantitative data collection, over a 7-week period, consisted of administering the QRI-4 assessment to participants in both groups at two points in time pre-test and post-test). The students were individually tested. Scores from the pre-test were used to ensure that the students in the experimental treatment and control groups were not different in their performance in word recognition, fluency, comprehension, and instructional reading level before the experimental treatment. After the treatment a post-test was administered using the QRI-4 and compared the post-test scores with the pre-test scores to determine if students in the experimental group had gained significantly over their counterparts in the control group. All pre-tests and post-tests were conducted prior to the treatment and after the treatment.

Doubly multivariate repeated measures ANOVA at an alpha level of .05 was used to examine the simultaneous differences in the dependent variables fluency (WPM), word recognition (WR), comprehension (Comp), and instructional reading level (RL) on the same instructional reading level attained at the pre-test initially at two points in time (pre-test to post-test). Simultaneous differences reported by the *F* test statistics from pre-tests to post-test by group were analyzed first by checking for significant interactions. Then comparisons were conducted using *t*-tests on each of the dependent variables and determining effect sizes.

Interpretive case study data collection consisted of 28 classroom observations (14 for each group) over 7 weeks, during the fourth quarter of the 2006-2007 school year. Observations occurred twice a week and observational field notes were taken during each 50-minute class session. These observations focused on describing the relationship, if any, between the literacy task the music teacher assigned (rereading through singing). Focusing on the interactions (peer talk, peer modeling, and peer social reinforcement) among students who were singing using the interactive program *Tune Into Reading,* versus the peer interactions among students who sang in the traditional music class.

The data analysis for this case study involved the constant comparative method (Glaser & Strauss, 1967). The first task involved typing the field notes from the observations and then reading through the notes three times to gain a holistic sense of the data. This was followed by returning to the data and bracketing the categories of peer interactions. After the elements of peer interactions were identified, they were assigned construct names. The elements with the construct names assigned were then cut-up and placed in a folder. The frequency of each construct was tallied to determine whether or not an element was emphasized during the peer interactions. The frequency calculations were followed by organizing the constructs into categories. Each category of constructs was placed on a bulletin board and further analysis determined the themes that emerged from these data. These themes were presented first as individual cases, and then as a cross case analysis.

3.1 Credibility

To address the issue of credibility a second observer was used and analysis checks were done with two qualified literacy researchers. In addition, a triangulation strategy for this concurrent mixed methods study was used in an attempt to confirm, cross-validate, or corroborate findings within a single study.

4. Results

4.1 Summary of Finding for Question 1

The treatment group, using the interactive singing software *Tune Into Reading*, demonstrated a significant increase with large effect sizes in Fluency (WPM) d=.8 and Reading Comprehension (COMP) d=1.17 and Reading Level (RL) d=.7 as compared to the control group. In addition, although there were no observed differences noted in the interaction for Word Recognition (WR), the treatment group effect size was larger d=.6 than the control group effect size of d=.2. Table 2 displays the interactions and effect sizes for the groups by variables.

These findings suggests that rereading through singing, using the interactive singing program, *Tune Into Reading,* was more effective regardless of the reading levels for treatment students compared to control students. These results can be interpreted as rereading through singing in the music classroom alone, as was the case for the control students, does not improve WPM, WR, COMP, and RL for the students of varying reading abilities.

4.2 Summary of Finding for Question 2

When the students were stratified by FCAT Levels 1 and 2 *Below* and FCAT Level 3 *AT* and FCAT Level 4 and 5 *Above* on WPM, there was a statistically significant difference for the treatment groups between, across time and within FCAT levels 1-3. However, for FCAT Levels 4 and 5 on WPM, there was no significant difference. Although there were no observed differences noted in the interaction for Word Recognition (W/R), the treatment group had a larger effect size than the control at all levels. Furthermore, Reading Comprehension (COMP) for the treatment group at all levels demonstrated a significant increase with large effect sizes. Finally, for Instructional Reading Level (RL), the treatment groups showed a significant increase in RL with a larger effect size as compared to the control groups. Table 3 displays the effect sizes for the groups by FCAT Levels on the four variables.

An examination of Table 3 implies that for the different FCAT levels of treatment students the effect size varied. Particularly, those students needing fluency (WPM) increased in reading rate; whereas, those needing more opportunities for reading comprehension increased in their scores. This suggests that the use of interactive sing-to-read program provided for its user's differentiated results, which resulted in addressing the various needs at the different levels.

4.3 Summary of Question 1 Case Study Descriptive Findings

The theme *Social Systems* appears to capture the essence of peer interactions for the treatment and control groups. Within this theme, there were four constructs embedded. They were: (a) *Peer Positions,* (b) *Instruction Expectations*, (c) *Alternative Approaches to Tasks*, and (d) *Reading Strategies*.

The treatment and control group had in place a social system that positioned some of its peer members in the role of dominance over the other peers. Both groups contained this two class system where a small group or individuals lead the rest of the group pertaining to acceptable social behavior. Within the treatment group, the peers modeled behaviors or talk that resulted in the rest of the peers imitating their behaviors, whereas, within the control group, the dominant peers directed the other

Variables	Time X Group	Treatment n=32	Control
WPM	*	d=.8	d=.2
WR	NS	d=.6	d=.2
COMP	***	d=1.17	d=.3
RL	***	d=.7	d=.1

* Note * small significant effect, *** large significant effect, and NS no significant effect.

Table 2. Interactions and Effect Sizes

Variables	FCAT 1 and 2		FCAT 3		FCAT 4 and 5	
	Treatment	Control	Treatment	Control	Treatment	Control
WPM	d=1.1	d=.7	d=1.4	d=.1	d=.4	d=.3
WR	d=1.0	d= .4	d=.5	d=.2	d=.6	d=.2
COMP	d=.3	d= 0	d= 1.2	d=0	d=.6	d=.-4
RL	d=.7	d=.1	d=.9	d=0	d=.5	d=0

Table 3. Effect Size for Treatment and Control Groups by FCAT Level

members to conform to a certain behavior they deemed socially acceptable. In addition, the instructional expectations appeared to be interpreted by the dominate peers and then reinforced through their interactions with the rest of the peer group. In the control group the expectation was that, there was only one right way to perform the singing and drumming, however, the treatment group was expected to try their best. The dominant peers in the treatment group would encourage and support one another, modeling collaboration to the other peers, whereas, the control group appeared to be compelled to take on the task of reinforcing group accuracy. Furthermore, both groups initially appeared to find these alterative approaches to learning motivating and engaging. However, around the fourth week of the intervention, a shift occurred within both of the groups. The peers within the control group became disengaged towards the task, including the dominant peers. The control group peers would daydream, talk, and entertain each other, as their motivation levels shifted from highly motivated to complacent. In contrast, the treatment group of students' motivation shifted from external motivation to internal for all the peers, including the dominant peers. They became engaged in the task and self-regulated in their learning. Finally, fluency instruction for the students was the same in both groups. The students were exposed to repeated readings of the songs, while embedding prosodic features of text. The students reread (re-sang) their songs three or more times each session and each group was supported with the prosodic features of songs through background music or the drums. However, the statistical findings reported that only the treatment students showed increases in all reading areas. This might be interpreted as the socio-cultural interactions of the peers that are motivating, engaging and provide instructional expectation that value differentiation through the use of individual technology programs highly influencing reading outcomes.

5. Discussion

The treatment students worked in the computer lab in small group communities, and curriculum delivery was accomplished through individual computer usage. However, the classroom structure for the control group was through a whole group format, and curriculum delivery was provided to the entire body of students. It was found that the treatment group who individually used the interactive sing-to-read program, *Tune Into Reading,* had higher reading outcomes compared to the control group. The inference is that in order to meet and address the reading fluency needs for this population of literacy learners, instruction and delivery of curriculum should be differentiated. Therefore, if fluency instruction is to be successful, the curriculum delivery should provide opportunities for individual work. In this study it was accomplished through a technological format that enhanced reading outcomes for the early adolescents who participated in the *Tune Into Reading* program.

Biancarosa and Snow (2006) reported to the Carnegie Corporation, over 70% of adolescents struggle with their reading in some manner, and therefore, require differentiated and strategic instruction. Furthermore, they contend that when thinking about reading fluency for the early adolescents, there are a range of literacy needs to be met for this population. Some students may still need support with reading the words, whereas other students can read the words accurately but need support with comprehension. Still, other adolescents may know the strategies but haven't had sufficient practice within the classroom. What they need is instruction and support that addresses the differing literacy needs for all students.

As previously noted in the findings, for the treatment students that used the sing-to-read program, *Tune Into Reading,* the program was effective in meeting differentiated needs for each level. For students grouped as *Below* grade level in their reading, the intervention was more effective in the reading areas of Fluency (WPM) and Word Recognition (WR), whereas, for students grouped as *Above* grade level, the intervention was more effective on reading comprehension (COMP). This suggested that the sing-to read' program was effective for each group of students in reading areas required and therefore addressed the range of differing needs.

Reading prosody is the music and rhythm of oral language. Based on The Automaticity Theory, LaBerge

and Samuels (1974) define fluent reading as the ability to decode and comprehend text at the same time. Their theory suggests that cognition has only a limited capacity to process information. Therefore, decoding (at the word level) can become automatic, and the focus cognitively can be on the complex process of comprehending text.

The practice of repeated reading, as previously noted, is most authentic when the practiced material is eventually performed orally, such as singing lyrics to songs (Rasinski, 2004; Stayter & Allington, 1991). Therefore, singing performed by the students appears to exaggerate the language of reading, as the students find their voice in the rhythm and the bounce of music. The reader uses appropriate volume, rhythm, pitch, tone, and phrasing (prosody), while singing the song lyrics. In turn they give evidence of actively constructing meaning from the passage (Rasinski, 2004).

The findings of this study concur with Rasinski (2004), in part. Distinctively, prosody when rereading through singing appeared to have a direct connection to reading comprehension and increasing the instructional reading level. However, the practice of rereading, through singing by following the protocol recommended in the literature alone, did not produce the same findings. If that were indeed the case, then both groups should have increased in their reading. However, the treatment students significantly outperformed the control group.

According to the descriptive findings, the treatment group appeared to interact with the prosodic elements of text, rather than just being passively immersed as noted in the control group. This may be due to the practicality of this alternative technological format. Unlike a linear text that can not be stopped, started, or slowed down the students could interact with the text. In addition, the continuous background music assisted them because they did not have to use their cognitive capacity to remember the rhythm or beat of the song that was being automatically supplied. Therefore, they could focus on comprehending the text while the prosodic elements were automatically supplied by the background music.

Furthermore, the descriptive findings suggest that the peer group's socio-cultural interactions were different. The treatment and control groups had a two class social system in place that positioned some of its peer members in the role of dominance over other peers. However, within the treatment group, the dominant peers modeled behaviors or talk that was supportive and cooperative. This resulted in the rest of the peers imitating their behaviors through their interactions. Whereas, within the control group, the dominant peers interactions were discussions that directed the other members to conform to certain behaviors they deemed socially acceptable.

Finally, peer pressure can also take on the role of social reinforcement (Ryan, 2000) to participate in the task. Participation in the literacy tasks involving the treatment peer group positively modeled through the dominant peer interactions had a positive effect on the group's beliefs, decisions and motivation to participate by all of the group members. Whereas, within the control group setting, what appeared to happen was that peer pressure was applied by the dominant peers, and it was not positively received. Therefore, they disengaged from the task while trying to escape the pressure from their dominant counterparts. These findings suggest the role of the dominant peers and socio-cultural interactions have a significant influence in the reading performances and affective conditions of the group. This might be interpreted as the socio-cultural interactions modeled through the dominant peers in the classroom group can affect reading performance

Conclusion

The role of prosody appears to have a direct connection to reading comprehension; however, instructional emphasis of expressive reading tends to decrease for students once they leave the primary grades. Therefore, there is a need to incorporate models and practice of prosodic elements of reading text for students of all levels. In addition, opportunities for individual practice, rather than a whole group one-size-fits-all model, should be considered. It was found that students in the treatment group made a cognitive shift from assimilating the reading information to interacting and internalizing their learning. This, in part, appeared to be because they had

opportunities for individual practice using this technological format embedded with prosodic elements. Also, fluency instruction needs to be differentiated to meet the developing needs of these students. As noted in the findings, the treatment group using the interactive singing software, *Tune Into Reading,* made reading gains appropriate for their FCAT Levels. Furthermore, the descriptive data reported that alternative textual format the *Tune Into Reading* program that the treatment group used was not only motivating and engaging, but easily manipulated. The students could adjust the program, and this appeared to assist them in comprehending the prosodic elements of the text. Finally, for early adolescent's socio-cultural interactions highly influence academic and affective issues in reading.

Recommendations

Future research may consider:

- Larger sample size and randomizing sample for generalizablity purposes
- Lengthen the study duration
- Investigate a more diverse population
- Conduct a comparative study with different technology programs using singing
- Investigate embedded literacy to see if this transfer effect holds between other content areas
- Use multiple measures in case study to capture peer interactions

References

[1]. Alfassi, M. (2004). Reading to learn: Effects of combined strategy instruction on high school students. *Journal of Educational Research, 97,* 17184.

[2]. Alexander, P. A. (1998). The nature of disciplinary and domain learning: The knowledge, interest, and strategic dimensions of learning from subject-matter text. In C. Hynd (Ed.), *Learning from text across conceptual domains* (pp. 263-287). Mahwah: Erlbaum.

[3]. Alexander, P. A., & Jetton, T. L. (2000). Learning from traditional and alternative texts: New conceptualization for an information age. In A. Graesser, M. Gernsbacher, & S. Goldman (Eds.), *Handbook of discourse processes*. Mahwah: Erlbaum.

[4]. Alvermann, D. E. (2002). Effective literacy instruction for adolescents. *Journal Literacy Research,* 34, 189-208.

[5]. Alvermann, D. E., & Phelps, S. P. (2005). *Content reading and literacy: Succeeding in today's diverse classroom* (4th Ed.). Boston: Pearson Education.

[6]. Biancarosa, C., & Snow, C. E. (2006). Reading nextA vision for action and research in middle and high school literacy: A Report to Carnegie Corporation of New York (2nd ed.).Washington, DC: Alliance for Excellent Education.

[7]. Bean, T. W. (2000). Reading in the content areas: Social constructivist dimensions. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 629-644). Mahwah: Erlbaum.

[8]. Biggs, M. C., Homan, S.P., Dedrick, R., Minick, V., & Rasinski, T. A. (2008). Using an interactive singing program: A comparative study of middle school struggling readers. *Reading Psychology-An International Quarterly.* Vol. 29 (3) 195-213

[9]. Bogdan, R. & Biklen, S. K. (2003). *Qualitative research for education: An introduction to theories and methods* (4th Ed.). Boston: Pearson Education Group.

[10]. Bulgren, J. A., Schumaker, J. B., Deshler, D. D., Lenz, B. K., & Marquis, J. (2002). The use and effectiveness of a comparison routine in diverse secondary content classrooms. *Journal of Educational Psychology,* 94, 35671.

[11]. Butzlaff, R. (2000). Can music be used to teach reading. *Journal of Aesthetic Education,* 34(3), 167-178.

[12]. Cottle, T. J. (2001). Mind fields-Adolescents consciousness in a culture of distraction. *New York: Peter Lang.*

[13]. Creswell, J. W., Plano Clark, V. L., Guttman, M., Hanson, W. (2003). Advanced mixed methods research design. In A. Tashahhori & C. Teddlie (Eds.), *Handbook on mixed methods in the behavioral and social sciences,* (pp. 209-240). *Thousand Oaks: Sage Publications.*

[14]. Donahue, P. L., Voelkl, J. R., Campbell, J. R., &

Mazzeo, J. (1999). *NAEP 1998 reading report card for the nation and states.* Washington, DC: Department of Education

[15]. Dowhower, D. L. (1991). Speaking of prosody: Fluency's unattended bedfellow. *Theory into Practice*, *30,* 158-164.

[16]. *Electronic Learning Systems.* **(2006).** Carry-a-Tune Learn to Sing Program. Tampa, Florida.

[17]. Elish-Piper, L., & Tatum, A. W. (2006). Addressing the literacy needs of adolescent students: Listening to their voice. *The NERA Journal,* 42(1), 1-12.

[18]. Glaser, B. G. & Strauss, A. L. (1967). *The discovery of grounded theory. Chicago: Aldine Publishing Company.*

[19]. Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. Kamil, P.B. Monsental, P.D. Pearson & R. Barr (Eds.) *Handbook of Reading Research,* 3, 403-422.

[20]. Guthrie, J. T., & Davis, M. H. (2003). Motivating struggling readers in middle school through an engagement mode of classroom practice. *Reading and Writing Quarterly,* 19, 59-84.

[21]. Hall, L., Boone, N., Grashel, J. & Watkins, R., Eds. (1997). Strategies for Teaching: Guide for Music Methods Classes. Reston: Music Educators National Conference.

[22]. Kamil, M. (2002). Adolescence and literacy: Reading for the 21st century. *A Summary of the Research: National Assessment of Education progress.*

[23]. Kuhn, M.R., & Stahl, S. A. (2003). Fluency: A review of development and remedial practices. *Ann Arbor: Center for the Improvement of Early Reading Achievement.*

[24]. LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology, 6*, 293-323.

[25]. Lamb, S. J., & Gregory, A.H. (1993). The relationship between music and reading in beginning readers. *Educational Psychology*, 13, 19-27.

[26]. Lenz, B. K, & Deshler, D. D. (2004). Teaching content to all: Evident-based inclusive practices in middle and secondary schools. Boston, USA.

[27]. Leslie, L., & Caldwell, J. (2006). *Qualitative Reading Inventory-4.* Boston, MA.: Allyn & Bacon.

[28]. Leu, D. J., Jr. (2000). Literacy and technology: Deictic consequences for literacy education. In an information age. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research,* 3, 743-770. New York: Longman.

[29]. Merriam, S. B. & Associates (2002). *Qualitative research in practice: Examples for discussion and analysis.* California: Jossey-Bass.

[30]. Moje, E. B., Young, J. P., Readence, J. E., & Moore, D. W. (2000). Reinventing adolescent literacy for new times: Perennial and millennial issues. *Journal of Adolescent & Adult Literacy,* 43(5), 400-410.

[31]. National Center for Education Statistics, National Assessment of Educational Progress: The Nation's Report Card, Web site, 2005. Retrieved January 7, 2007, from http://nces.ed.gov/nationsreportcard.

[32]. National Reading Panel Report. (2000). Teaching children to read: An evidence-based assessment of scientific-research literature on reading and its implications for reading instruction. *Washington, D. C.: National Institute of Child Health and Human Development.*

[33]. No Child Left Behind Act, Department of Education, Washington, D. C. Retrieved January 7, 2007 from http://www.ed.gov/nclb/landing.jhtml

[34]. O'Brien, D. G., Stewart, R. A., & Moje, E. B. (1995). Why content literacy is difficult to infuse into the secondary school: Complexities of curriculum, pedagogy, and school culture. *Reading Research Quarterly, 30,* 442-463.

[35]. Pearson, P. D., Ferdig, R. E., Blomeyer, Jr, R. L. & Moran, J. (2005). The effects of technology on reading performance in the middle-school grades: A meta-analysis with recommendations for policy. Education, contract number ED-01-CO-0011.

[36]. Phelps, S. (2005). Ten years of research on adolescent literacy, 1994-2004: A review. Learning Point Associates. North Central Regional Laboratory, Institute of Education Sciences, U.S. Department of Education, contract number ED-01-CO-0011.

]37]. Pikulski, J.J. (1991), The transition years: Middle School. In J. Flood, J. M. Jensen, D. Lapp & J. R. Squre (Eds.), *Handbook of research on teaching the English Language arts* (pp. 303-319) Network: Macmillan.

[38]. Rasinski, T. V. (2004). Creating fluent readers. *Educational Leadership,* 61(6), 46-51.

[39]. Ryan, A. M. (2000). Peer group as a context for the socialization of adolescents' motivation, engagement, and achievement in school. *Educational Psychologist,* 35(2), 101-111.

[40]. Samuels, S. J. (1979). The method of repeated readings. *The Reading Teacher,* 41, 756-760.

[41]. Schreiber, P. A. (1991). Understanding prosody's role in reading acquisition. *Theory into Practice*, 30, 158-164.

[42]. Schreiber, P. S., & Read, C. (1980). Children's use of phonetic cues in spelling, parsing, and maybe- reading. *Bulletin of the Orton Society*, 30, 209-224.

[43]. Stayter, F. Z., & Allington, R. L., (1991). Fluency and the understanding of text. *Theory into practice,* 30(3), 143-148.

[44]. Tashakkori, A., & Teddlie, C. (2003). Mixed methodology: Combining qualitative and quantitative approaches. (Eds.). *Thousand Oaks, CA: Sage Publications.*

[45]. Vacca, R. T. & Vacca, J. L. (2002). Content area reading: Literacy and learning across the curriculum (7th ed.). Boston MA: Allyn & Bacon.

[46]. Wade, S. E., & Moje, E. B. (2000). The role of text in classroom learning. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, R. Barr (Eds.). *Handbook of reading research* (Vol. 3, pp. 609-627). Mahwah New York: Erlbaum.

[47]. Webster, P. R. (2002). Computer-based technology and music teaching and learning. In R. Colwell& C. Richardson (Eds.), *The New Handbook of Research on Music*

ABOUT THE AUTHORS

** & ** Assistant Professors, St. Petersburg College of Education, Department of Reading, St. Petersburg, Florida, U.S.A.*

Marie C. Biggs, Ph.D is an Assistant Professor at St. Petersburg College of Education with a focus on reading and language arts. She has more than 20 years of experience in New England and the Southeast working with struggling "at risk" readers as a reading specialist, college-level instructor, consultant, and researcher in literacy education. Over the last four years her research focus has been on the use of alternative technological texts through singing with over 2,000 struggling adolescent readers in grades 4 through 12 from the state of Florida. She can be reached at biggs.marie@spcollege.edu

Nancy A. Watkins, Ed.D, is currently an Assistant Professor for the College of Education, St. Petersburg College. Prior to teaching at the college level, she taught in public elementary schools for 12 years. She has worked with students from many cultures and a wide variety of socio-economic settings. Her passion in research and teaching interests include literacy instruction (especially with at-risk students) and creative and critical thinking. She can be contacted at Watkins.nancy@spcollege.edu.