



Gara Field  
The University of Georgia, USA

# **from quantitative results to qualitative meaning: a look at renzulli learning through the eyes of students, teachers, and administrators at oak hills elementary school and inman middle school**

## **Abstract**

*This article summarizes an experimental study that investigated the use of Renzulli Learning on oral reading fluency, reading comprehension, science achievement, and social studies achievement among 383 elementary and middle schools students. The Renzulli Learning System is an on-line educational learning system and profiler designed to match student interests, learning styles, and expression styles with highly challenging enrichment resources. Students were randomly assigned to use Renzulli Learning for 2-3 hours each week for 16-weeks, and those students who participated demonstrated significantly higher growth in reading comprehension, oral reading fluency, and social studies achievement than control group students who did not participate in Renzulli Learning.*

Many researchers have uncovered positive relationships between the uses of technology and educational achievement among school-aged children (Azzam, 2006; Coiro, 2003; Labbo, 1996; Mann & Shafer, 1997; Jennings & Lucca, 2005; Coiro, Knobel, Lankshear, & Leu, 2008), however, few have investigated how or if the use of Internet technology can help increase reading fluency and reading

comprehension among elementary and middle school students. Field (2007) conducted a quantitative study to explore the use of Renzulli Learning (RL) in heterogeneously mixed classrooms of identified gifted and non-gifted students in grades 3 – 8, specifically in relation to reading fluency, reading comprehension, science, and social studies.



## *Renzulli Learning*

(<http://www.renzullilearning.com>) is an on-line educational profiler and learning system for students, as well as a database, search engine, and differentiation tool for teachers. RL matches students' interests, learning styles, and expression styles with educational activities, research sites, and enrichment resources that number in the tens of thousands. A review of related research, an overview of Renzulli Learning, and a summary of the research conducted by Field (2007) precede how research guided educational practices in two schools. Finally, administrators from Oak Hills Elementary School in Oak Park, CA, and Inman Middle School in Atlanta, GA share personal experiences and real life examples of how RL was used by students and teachers at their respective schools since the completion of the Field study.

## *Review of Related Research:*

### **Technology and Learning**

Prensky (2001) cited discrepancies in the way adults and children perceive differences in technology, and contended that the current U.S. educational system was not designed to teach today's tech-savvy learners. The chasm between school-aged students and their adult teachers is summarized succinctly by Prensky who dubbed today's students as "digital natives" and a large proportion of the teacher population as "digital immigrants" who each speak a different language in the world of technology and learning. Some research findings in gifted education support Prensky's widely accepted distinctions in the way people perceive students and those who teach them.

In early research on technology and education, positive changes were evident in classrooms where teachers used the Internet as part of their instruction (Garner & Gillingham, 1996, 1998). Siegle (2003, 2004) investigated an identified gifted population of students with technological prowess and concluded that technology is viewed as an appropriate way to maintain interest and engagement in learning among those students. "While a myriad of quality educational software programs exist, some of the best programs resemble an empty box in that they begin with a blank screen upon which children can apply their creative imagination and talents" (Siegle, 2003, p. 35). Coiro and Dobler (2007) studied online reading comprehension strategies used by 6th-grade readers and found that those students who experienced successful reading experiences required complex applications of prior knowledge, inferential reasoning strategies; and self-regulated reading processes. Precocious and academically talented students appear to be in the generation of digital natives who incorporate technology into their cognitive learning processes; while many of their teachers are from a generation of digital immigrants who struggle to master an ever-changing language of technology. Siegle and Foster (2001) reported that student achievement increased in science when students created multimedia projects illustrating the concepts they were learning in school.

There is growing interest in the field of education about whether technology can help to improve learning, self-efficacy, and motivation among students and teachers. Hogarty, Lang, and Kromrey (2003) and the National Center for Education Statistics (1999, 2000) investigated teachers' perceptions of self-efficacy in relation to their technology usage, while Azzam (2006) and

Coiro (2003) have each studied the perceived benefits for students who use technology. Furthermore, research on the 'new literacies' by Coiro et al. (2008) and Leu, Leu, and Coiro (2004) on perceived benefits among teachers who use technology in the classroom, as well as research on teachers of the gifted (Shaunessy, 2007), have piqued interests about the practical applications of such by teachers and administrators nationwide. Field (2007) conducted a quantitative study (n = 383) on Renzulli Learning and student achievement in relation to reading fluency, reading comprehension, science, and social studies achievement among elementary and middle school students in grades 3 – 8.

### *Overview of Renzulli Learning*

Renzulli Learning, an electronic search-engine and profiler that matches students' perceived interests, abilities, learning styles, and expression styles to over thirty-five thousand enrichment activities, is based on The Enrichment Triad Model (Renzulli, 1977) and the Schoolwide Enrichment Model (SEM) developed by Renzulli and Reis (1997). Representing over 30 years of research conducted at the University of Connecticut's Neag School of Education, the SEM is recognized as one of the most widely used plans for enrichment and talent development in the world.

The SEM is defined as, "a systematic set of specific strategies for increasing student effort, enjoyment, and performance, and for integrating a broad range of advanced level learning experiences and higher order thinking skills into any curricular area, course of study, or pattern of school organization" (Renzulli & Reis, 1997, p. 20). The original paper-based SEM instruments that are a part of RL have been field tested

for over 20 years in thousands of schools. Since the advent of Renzulli Learning in 2005, its licensed user base has grown to over 363,600 students and 49,500 teachers in 2,600 schools in 896 districts across 42 U.S. states, as well as Canada, Hong Kong, Jordan, Turkey, South Africa, Bermuda, and New Zealand.

### *Summary of Study*

Quantitative procedures were used in an empirical research study to investigate the use of Renzulli Learning on reading fluency, reading comprehension, science achievement, and social studies achievement in two schools: a suburban elementary school in an upper-middle class neighborhood of southern California and an urban middle school in Atlanta, Georgia where nearly half of all students are considered to be at risk due to poverty or other factors (Field, 2007). An experimental design was used with random assignment of students to treatment and control groups in each school, and repeated-measures analysis of variance (ANOVA) procedures were used to explore specific group differences within a sample of 383 students across grades 3–8. Oral reading fluency tests and the Iowa Test of Basic Skills in reading comprehension, science, and social studies were used as the pre- and post-tests.

In July 2006, two research sites were selected after the administration and faculty at both schools agreed to participate in this study and each received the school Superintendent's approval. One of the schools selected for the study was Oak Hills Elementary School (K-5) in Oak Park, California where the total school enrollment for the 2006–2007 school year was 403. Oak Hills Elementary School (OHES) is one of three elementary schools in Oak Park

Unified School District located in a middle-upper class suburban neighborhood of Ventura County.

Treatment groups in 3rd, 4th, and 5th grades ( $n = 96$ ) met for 16 weeks for approximately 2-3 hours each school week in heterogeneously mixed classrooms at Oak Hills Elementary. Teachers and students at Oak Hills were randomly selected for treatment and control groups in the study. Control groups in 3rd, 4th, and 5th grades ( $n = 89$ ) at Oak Hills did not have access to Renzulli Learning for the same 16-week period, but all students and teachers were

granted access to the system after the intervention. Data regarding Oak Hills Elementary School, the state of California, and the Renzulli Learning study for ethnic distribution and comparison of students is provided in Table 1.

The other school selected as a research site for this study was Inman Middle School in Atlanta, Georgia where the total school enrollment in grades 6–8 during the 2006–2007 school year was 701. Inman Middle School (IMS) is 1 of 16 public middle schools in the Atlanta Public School (APS) district. The IMS teacher/student ratio in

**Table 1:** Ethnic distribution of Students at the Elementary School Site, Across the State, and in the RL Treatment Group

Ethnicity	Elementary School research site	State - CA	RL Study
African-American	3%	8%	0%
Asian	15%	8%	8%
Caucasian	76%	30%	75%
Hispanic	4%	48%	3%
Multi-racial	< 1%	2%	3%
Other	3%	2%	11%

**Note:** Data obtained from <http://www.greatschools.net/cgi-bin/ca/other/7636> and the California Department of Education, 2005-06.

**Table 2:** Ethnic Distribution of Students at the Middle School Site, Across the State, and in the RL Treatment

Ethnicity	Middle School research site	State - GA	RL Study
African-American	55%	38%	50%
Asian	1%	3%	2%
Caucasian	38%	49%	40%
Hispanic	2%	8%	5%
Multi-racial	3%	2%	3%

**Note:** Data obtained from [http://www.atlanta.k12.ga.us/content/aps/FastFacts\\_0607.pdf](http://www.atlanta.k12.ga.us/content/aps/FastFacts_0607.pdf) and <http://www.greatschools.net/cgi-bin/ga/other/35>

grades 6 – 8 is 1:13, and 40% of IMS students are eligible for free and reduced meals.

At IMS, treatment groups in 6th, 7th, and 8th grades (n = 106) met for 16 weeks for approximately 2–3 hours each school week in the heterogeneous grouped Technology Connections classes. Inman Technology classes met on a rotating A and B schedule, therefore one period each week would meet twice and the other would meet three times –alternating each week. Students at the Inman site were randomly selected, however the Technology Connections teacher was not. Control groups in 6th, 7th, and 8th grades (n = 92) at Inman did not have access to Renzulli Learning for the same 16-week period, but all students and teachers had access to the system at the completion of the intervention. Data regarding Inman Middle School, the state of Georgia, and the Renzulli Learning study for ethnic distribution and comparison of students is provided in Table 2. The total sample of students (n = 383) from each school who participated in the Renzulli Learning study (Field, 2007) is summarized in Tables 3 and 4.

## Research Questions

This study investigated differences in students' reading fluency, reading comprehension, science achievement, and social studies achievement between treatment and control conditions (using or not using RL) on pre- and post-tests. According to Field (2007), the following research questions were addressed through quantitative analyses and guided this study:

1. Is there a significant difference from pre-test oral reading fluency scores to post-test oral reading fluency scores for students who participated in Renzulli Learning and students who did not participate in Renzulli Learning?
2. Is there a significant difference from pre-ITBS reading comprehension scores to post-ITBS reading comprehension scores for students who participated in Renzulli Learning and students who did not participate in Renzulli Learning?
3. Is there a significant difference from pre-ITBS science achievement scores to post-ITBS science achievement scores for

**Table 3:** Sample of Students at Oak Hills Elementary School – Oak Park, CA

Grade	Treatment	Control	Total
3rd	39	27	66
4th	26	30	56
5th	31	32	63
Total	96	89	185

**Table 4:** Sample of Students at Inman Middle School – Atlanta, GA

Grade	Treatment	Control	Student Total
6th	19	27	46
7th	43	31	74
8th	44	34	78
Total	106	92	198

- students who participated in Renzulli Learning and students who did not participate in Renzulli Learning?
4. Is there a significant difference from pre-ITBS social studies achievement scores to post-ITBS social studies achievement scores for students who participated in Renzulli Learning and students who did not participate in Renzulli Learning?

### *Renzulli Learning Profiler & Enrichment Activities*

Students in the experimental group of heterogeneously mixed and randomly assigned classes at both schools registered and used Renzulli Learning for 2–3 hours per week for 16 weeks. Each student in the experimental group completed the Renzulli Learning Profiler, an online questionnaire about students’ interests, abilities, learning styles, and modes of expression. Upon completion of the Profiler, these treatment students had access to their own Enrichment

Database on Renzulli Learning, as well as an entire database of over thirty thousand educational resources and activities broken down into the following categories: virtual field trips; real field trips; creativity training; projects and independent study; contests and competitions; websites; fiction books and e-books; non-fiction books and e-books; how-to books and e-books; summer programs; on-line activities and classes; research sites; and videos and DVDs. An illustration of the Renzulli Learning Enrichment Activities Database is included in Figure 1.

Field (2007) emphasized how the role of the teacher changed throughout the study, from the traditional model of consistently planned and prescribed lesson plans to one of facilitated enrichment learning by becoming the “guide-on-the-side” (Renzulli, 1977; Renzulli & Reis, 1997). The use of authentic methods, technological resources, and students’ self-selected topics for independent study help define the basic characteristics of enrichment learning



Figure 1: Screen capture of Renzulli Learning

(Renzulli & Reis, 1997). Enrichment learning and teaching, as described in the SEM model, was a vital part of the Field (2007) study. Teachers also used Renzulli Learning as a search engine to differentiate instruction. RL helped teachers locate resources that supported and enhanced what was being taught in the regular curriculum; create flexible groups based on learning styles; and allow students to produce work based on their preferred modes of expression.

### Data Analysis

Repeated-measures ANOVA procedures were used in the quantitative analysis (Field, 2007). For research question 1, the between variables were students using Renzulli Learning (treatment) and students not using Renzulli Learning (control). The repeated measures were the students' oral reading fluency pre-tests and post-tests. For research question 2, the between variables were students using Renzulli Learning (treatment) and students not using Renzulli Learning (control). The repeated measures were the students' ITBS reading comprehension pre-tests and post-tests. For research question 3,

the between variables were students using Renzulli Learning (treatment) and students not using Renzulli Learning (control). The repeated measures were the students' ITBS science pre-tests and post-tests. For research question 4, the between variables were students using Renzulli Learning (treatment) and students not using Renzulli Learning (control). The repeated measures were the students' ITBS social studies pre-tests and post-tests. Differences were examined between treatment and control groups in reading fluency, reading comprehension, science achievement, and social studies achievement.

### Results

Field (2007) reported that a two-way repeated-measures ANOVA was used to explore differences between treatment and control students. After 16 weeks, students who participated in Renzulli Learning demonstrated significantly higher growth in reading comprehension ( $p < .001$ ), significantly higher growth in oral reading fluency ( $p = .016$ ), and significantly higher growth in social studies achievement ( $p =$

**Table 5:** Oral Reading Fluency Mean Scores by Groups

		Pre-test			Post-test		
		n	M	SD	n	M	SD
Control	Not Gifted	131	135.95	35.52	131	149.74	33.42
	Gifted	50	180.49	31.74	50	191.51	26.88
	Total	181	148.21	39.80	181	161.24	36.79
Treatment	Not Gifted	147	129.98	39.09	147	147.84	38.38
	Gifted	55	183.04	27.25	55	198.26	26.92
	Total	202	144.11	43.21	202	161.27	42.05
Total	Not Gifted	278	132.78	37.51	278	148.73	36.08
	Gifted	105	181.81	29.38	105	195.02	26.98
	Total	383	146.05	41.63	383	161.25	39.60

**Table 6:** ANOVA for Main Effects and Interaction Effects on Oral Reading Fluency

Variable	df	MS	F	$\eta^2$
Time	1	31104.72	289.38***	.44
Time x Treatment	1	634.94	5.91**	.02
Time x Gifted	1	270.62	2.52	.01
Time x Treatment x Gifted	1	0.18	0.00	.00
Error (Time)	373	107.49		

\*\*  $p < .05$ . \*\*\*  $p < .001$ .

**Table 7:** ITBS Reading Comprehension Standardized Mean Scores by Groups

		Pre-test			Post-test		
		n	M	SD	n	M	SD
Control	Not Gifted	131	223.33	32.62	131	231.44	30.66
	Gifted	50	273.14	31.26	50	276.00	30.63
	Total	181	237.09	39.16	181	243.75	36.52
Treatment	Not Gifted	147	207.07	30.76	147	224.33	31.81
	Gifted	55	272.62	26.98	55	287.00	29.13
	Total	202	224.92	41.69	202	241.39	41.77
Total	Not Gifted	278	214.73	32.62	278	227.68	31.42
	Gifted	105	272.87	28.95	105	281.76	30.22
	Total	383	230.67	40.92	383	242.50	39.34

**Table 8:** ANOVA for Main Effects and Interaction Effects on Reading Comprehension

Variable	df	MS	F	$\eta^2$
Time	1	17250.45	78.90*	.17
Time x Treatment	1	4061.26	18.58*	.05
Time x Gifted	1	627.09	2.87	.01
Time x Treatment x Gifted	1	53.38	0.24	.00
Error (Time)	379	218.63		

\*  $p < .01$ .

.013) than those students who did not participate in Renzulli Learning. No differences were found for science achievement (Field, 2007).

The mean scores by groups for reading fluency (Table 5); reading comprehension

(Table 7); science achievement (Table 9); and social studies achievement (Table 11), as well as the ANOVA for Main Effects and Interaction Effects for reading fluency (Table 6); reading comprehension (Table 8); science achievement (Table 10); and social studies achievement (Table 12) are provided below.

**Table 9:** ITBS Science Achievement Standardized Mean Scores by Groups

		Pre-test			Post-test		
		n	M	SD	n	M	SD
Control	Not Gifted	131	224.29	29.37	131	238.02	32.17
	Gifted	50	272.76	38.10	50	285.92	31.46
	Total	181	237.90	38.70	181	251.47	38.50
Treatment	Not Gifted	147	212.82	35.18	147	231.9	37.29
	Gifted	55	277.22	29.30	55	295.93	29.73
	Total	202	230.44	44.24	202	249.42	45.45
Total	Not Gifted	278	218.18	33.04	278	234.76	35.06
	Gifted	105	275.10	33.69	105	291.16	30.83
	Total	383	233.95	41.84	383	250.38	42.29

**Table 10:** ANOVA for main effects and interaction effects on science achievement

Variable	df	MS	F	$\eta^2$
Time	1	39572.77	130.14***	.26
Time x Treatment	1	1123.73	3.70	.01
Time x Gifted	1	8.23	0.03	.00
Time x Treatment x Gifted	1	0.38	0.00	.00
Error (Time)	375	304.07		

\*\*\* $p < .001$ .**Table 11:** ITBS Social Studies Achievement Standardized Mean Scores by Groups

		Pre-test			Post-test		
		n	M	SD	n	M	SD
Control	Not Gifted	131	218.71	29.96	131	228.19	32.01
	Gifted	50	269.20	38.87	50	278.82	39.65
	Total	181	232.69	39.66	181	242.20	41.04
Treatment	Not Gifted	147	210.06	28.01	147	223.98	32.91
	Gifted	55	267.57	34.79	55	286.70	31.32
	Total	202	225.45	39.30	202	240.77	42.73
Total	Not Gifted	278	214.12	29.21	278	225.95	32.50
	Gifted	105	268.35	36.64	105	282.91	35.61
	Total	383	228.87	39.58	383	241.45	41.89



**Table 12:** ANOVA for Main Effects and Interaction Effects on Social Studies Achievement

Variable	df	MS	F	$\eta^2$
Time	1	25177.15	87.56**8	.19
Time x Treatment	1	1805.09	6.28**	.02
Time x Gifted	1	265.15	0.92	.00
Time x Treatment x Gifted	1	238.93	0.83	.00
Error (Time)	371	287.55		

\*\*  $p < .05$ . \*\*\*  $p < .001$ .

The main effect of time in the ANOVA for Main Effects tables, which is the effect of time averaged across groups, was estimated for each dependent variable. A significant time x treatment interaction effect was found for reading fluency, reading comprehension, and social studies. No interaction effect was found for science. Different slopes over time for the two treatment groups in the repeated measures ANOVA illustrated statistically significant growth for students who used Renzulli Learning (treatment) compared to students who did not use Renzulli Learning (control) in reading fluency, reading comprehension, and social studies achievement (Field, 2007).

Students who participated in the Renzulli Learning treatment group experienced significantly greater growth on average in oral reading fluency than students who did not have access to Renzulli Learning. A significant interaction, Wilks'  $\lambda = .984$ ,  $p < .05$ , was found between pre-test oral reading fluency scores for RL treatment students ( $M = 144.11$ ,  $SD = 43.21$ ) and non-RL control students ( $M = 148.21$ ,  $SD = 39.80$ ) and for post-test oral reading fluency scores for RL treatment students ( $M = 161.27$ ,  $SD = 42.05$ ) and non-RL control students ( $M = 161.24$ ,  $SD = 36.79$ ).

Students who participated in the Renzulli Learning treatment group also experienced significantly greater growth in

reading comprehension on the ITBS than students who did not have access to Renzulli Learning. The mean differences in the treatment group in reading comprehension were significantly greater than the control group. A significant interaction, Wilks'  $\lambda = .953$ ,  $p < .001$ , was found between pre-test reading comprehension ITBS scores for RL treatment students ( $M = 224.92$ ,  $SD = 41.69$ ) and non-RL control students ( $M = 237.09$ ,  $SD = 39.16$ ) and for post-test reading comprehension ITBS scores for RL treatment students ( $M = 241.39$ ,  $SD = 41.77$ ) and non-RL control students ( $M = 243.75$ ,  $SD = 36.52$ ). Students who participated in the Renzulli Learning treatment group experienced significantly greater growth on average in social studies achievement on the ITBS than students who did not have access to Renzulli Learning. The mean differences in the treatment group in social studies were significantly greater than the control group.

A significant interaction, Wilks'  $\lambda = .983$ ,  $p < .05$ , was found between pre-test social studies ITBS scores for RL treatment students ( $M = 225.45$ ,  $SD = 39.30$ ) and non-RL control students ( $M = 232.69$ ,  $SD = 30.66$ ) and for post-test social studies ITBS scores for RL treatment students ( $M = 240.77$ ,  $SD = 42.73$ ) and non-RL control students ( $M = 242.20$ ,  $SD = 41.04$ ).

The mean differences in the treatment group in science were not significantly

greater than the control group in science achievement on the ITBS. There was not a significant interaction, Wilks' = .990,  $p > .05$ , between pre-test science ITBS scores for RL treatment students ( $M = 230.44$ ,  $SD = 44.24$ ) and non-RL control students ( $M = 237.90$ ,  $SD = 38.70$ ) and for post-test science ITBS scores for RL treatment students ( $M = 249.42$ ,  $SD = 45.45$ ) and non-RL control students ( $M = 251.47$ ,  $SD = 38.50$ ). While students who participated in the Renzulli Learning treatment demonstrated similar growth in science achievement than those students who did not participate in Renzulli Learning, it is important to report that the results ( $p = .055$ ) approached the alpha level set at .05 for statistical significance.

### *Implications*

Quantitative research with positive results in the field of education relating to technology and learning may be powerful and beneficial to schools, especially when such research helps teachers and administrators guide best practices. Research by Renzulli and Reis (1997; 2007) suggest that when students are motivated to learn through independent projects based on interests, more engagement and success may be manifested in the learning process. Field (2007) found that when students were given access to Renzulli Learning to read, research, investigate, and produce, student achievement improved in relation to reading fluency, reading comprehension, and social studies achievement.

Higher reading fluency gains were achieved by students who accessed reading materials online using Renzulli Learning, especially topics in which they have interests, and it is likely that their reading fluency improved as a result. This finding is similar to the work of Reis and her

colleagues on the Schoolwide Enrichment Model – Reading (SEM-R) study who found that students' classroom use of the SEM-R for as little as 3 months resulted in higher reading fluency and reading comprehension (Reis et al., 2005). The SEM-R is also based on students' opportunities to read in areas of interest. The findings from both of these studies are of particular importance because oral fluency norms among middle school students across the United States have been found to be stagnant (Hasbrouck & Tindal, 2005).

In addition to higher reading fluency gains, reading comprehension and social studies achievement growth was significantly higher among treatment students. According to Field (2007), these results indicated that students who used Renzulli Learning to access new information that supported what they were learning in school (i.e., the regular curriculum) and students who used Renzulli Learning for enrichment and research were more likely to comprehend more of what they were reading. These results differ from the results of Kramarski and Feldman (2000) who found no improvement in the area of English reading comprehension achievement among middle school students who participated in an Internet embedded environment to study English. However, this study supports the research of Jennings and Lucca (2005) and Pearson, Ferdig, Blomeyer, and Moran (2005).

Jennings and Lucca (2005) found statistically significant differences in the reading comprehension scores of treatment and control groups among students of poverty (i.e., students who receive free and reduced meals). In this study, treatment students were taught using online virtual field trips and control students who were taught by only traditional methods. Pearson

et al. (2005) conducted a meta-analysis on the use of technology to teach reading comprehension in middle-school grades and found a positive weighted effect size of 0.489.

According to Field (2007), the positive findings for gains in reading comprehension in the study may be attributed in part to the instant access students had to a wider range of online resources and activities, including virtual field trips, critical thinking and research sites, and creativity training, projects, and independent studies by using Renzulli Learning. After participating in the Renzulli Learning study conducted by Field (2007), administrators at both research sites, Oak Hills Elementary School and Inman Middle School, chose to use the quantitative data and qualitative experiences of teachers and students to implement the Schoolwide Enrichment Model upon the study's completion.

### *Oak Hills Elementary School*

Oak Hills Elementary School is nestled in the foothills of the Conejo Valley just north of Malibu and the Agoura Hills in Ventura County of southern California. It holds many distinctions, including recognition as a National School of Excellence, a National Blue Ribbon School, and a California Distinguished School. Oak Hill's Principal, Leslie Heilbron, Ed.D., is not as concerned with the external honors OHES has received as she is with why her faculty, staff, and students have earned such distinctions for their school. Dr. Heilbron is a believer in best practices guided by solid quantitative data and authentic positive qualitative experiences. When Field (2007) conducted a quantitative research study at OHES, Dr. Heilbron listened to what teachers said and witnessed how students learned while using

Renzulli Learning. As a result, she watched the SEM come to life at Oak Hills Elementary School and shared her reflections on how RL impacted students and teachers' lives at OHES.

In a 2009 interview conducted by Field, Dr. Heilbron stated,

Oak Hills shares a united focus in providing challenging and meaningful experiences for all children. Individual differences are valued and nurtured through thoughtful teaching. We understand that children learn in a variety of ways and we recognize the importance of presenting curriculum in multiple modalities and at levels appropriate to an individual child's needs. Renzulli Learning has become an important modality to meet the individual student needs of our students (personal communication, February 21, 2009).

When asked about her role as Principal in the implementation of the SEM at Oak Hills, Dr. Heilbron responded,

Optimizing potential in all students is the goal of a principles-based educational leader. Educators in the area of gifted education need to join with educators of the general population as the field of gifted education has the opportunity to provide leadership in focusing attention on underserved populations, broadening differentiation and the individualizing of instruction and providing new models of instruction and strategies. It is, in my opinion, imperative that the pedagogy for the gifted be extended to include all students (personal communication, February 21, 2009).

This belief in the philosophical tenets of the SEM, as well as the benefits for teachers who differentiated instruction by using

Renzulli Learning, prompted Dr. Heilbron and her faculty to continue using Renzulli Learning in the 2007–2008 school year. Two faculty members, including Ms. D. (3rd grade) and Ms. W. (5th grade) shared their reflections on using Renzulli Learning with their students. According to Dr. Heilbron, “Both teachers felt that exposing students to advanced content involved the use of structures and tools, as well as knowledge, and it was the application of knowledge that appeared to have the greatest impact” (personal communication, February 21, 2009). Ms. W stated, “Our focus wasn’t just on reading. I think it was to increase their affective filter toward learning. There were students that really got excited about what they found. I think that was evident when you walked into the computer lab when we were ‘doing Renzulli’” (personal communication, May 2, 2008).

Dr. Heilbron also noted,

The model for learning, inherent in the Renzulli Learning System, is based on an inductive approach to solving real-world problems through the development of products and services. It creates a learning situation that involves the uses of methodology and higher order thinking skills. In terms of Enrichment Teaching, both teachers noted that the use of advanced content was both motivating and challenging for all students (personal communication, February 21, 2009).

The 5th graders at OHES used the Wizard Project Maker (WPM) in Renzulli Learning to create Type III products. The Wizard Project Maker enabled teachers to guide their students through the research process by providing them with an organizational framework and a storage portfolio for easy access to research and resources. The WPM helped OHES 5th

graders become practicing professionals as first-hand investigators, writers, artists, and other junior professionals throughout the creation of various products and services.

In 2007, a Renzulli Wizard Project Gallery Night was held at OHES where the students’ Type III work was presented to parents, teachers, and community members. Ms. W said,

Our Renzulli Gallery Night was a way to answer a lot of the questions that our parents were having and to bring it to a culmination. It was a way of saying that we experimented and dabbled in this, and this is our final product. It is a final product that can be presented and is student created at the same time. It was the students’ idea to design an invitation, and it was one student’s idea to have it at night because she needed to use a telescope. Then we figured out that we had to get the telescope from the high school. I have to say as a teacher I have been more of a learner than a stereotypical teacher might be. There have been some challenges and at the same time it has been really exciting hearing all the students’ ideas (personal communication, May 2, 2008).

Ms. D, the 3rd grade treatment teacher, commented,

I was surprised by how motivated the students were to tackle the difficult reading concepts that were presented in the Renzulli program. After watching them in this setting – I think I need to give them more experience with hands-on activities rather than expecting them to improve through reading remediation. These higher order processes were so motivating to them (personal communication, May 2, 2008).

This sentiment was echoed by Dr. Heilbron, who noted, “Teachers indicated

that their teaching strategies included more use of interest centers and community resources, as well as a reported an increase in independent thinking and problem solving among their students” (personal communication, May 2, 2008). One 5th grade student conceived and developed a landscaping project for the school, and Ms. W said, “This student had to use problem-finding, problem-focusing, and problem-solving skills to turn this idea into a reality” (personal communication, May 2, 2008).

The 5th grade treatment teacher, Ms. W, summed up her thoughts, Renzulli has really taken students outside of the classroom. It has exposed them to museums, aquariums and social action groups, and showed them that there is a lot for them to do. It is not just all reading and writing and math and social studies. And science is a lot more than SCIENCE. I mean, one student is talking about astronomy and microbiology and material science and electron microscopes that cost thousands and thousands of dollars – we can’t have them at school, but they can see images in electron microscopes through Renzulli. Another student got really excited about habitats and habitat conservation. Now he wants to go on an expedition, and the expedition that he’s been studying is one about research that scientists are doing in Borneo. He wants to email them and ask them questions about the things he has seen in their documentary on Renzulli. All of these things just started connecting for him. I could go on and on (personal communication, May 2, 2008).

### *Inman Middle School*

On the corner of Park Avenue and Virginia Avenue, with Atlanta’s Midtown skyline in

the background, sits Inman Middle School. Named after Samuel Martin Inman, an Atlanta civic leader who was described as passionate about education, philanthropy, and good citizenship, the school began its life as an elementary school in 1924. The building has undergone construction many times since its inception, and in 1978, Inman was converted into a middle school for students in grades 6-8. Inman Middle, a title I school with a diverse population of students from different ethnic and socio-economic backgrounds, underwent major renovations in 2004 by adding tremendous square footage, updating and renovating the interiors, and installing necessary electrical upgrades to allow for the installation of computer equipment and high-speed digital technology to help usher the school into the 21st century.

Under the leadership of Dr. Betsy Bockman, IMS has been recognized as a National School of Excellence and a Georgia School of Excellence. The Governor’s Office of Student Achievement named Inman as a 2008 Platinum Award Winner – only one of nine middle schools in the state of Georgia to earn such an honor. Dr. Bockman credits her faculty (with a commitment to setting high standards, enrichment teaching, and enrichment learning) as one of the reasons Inman students consistently excel. In 2008, the Georgia Department of Education bestowed Inman with three Superintendent’s Distinguished Achievement Awards for exemplary performances on the statewide CRCT standardized tests in 6th grade science, 8th grade reading, and 8th grade social studies.

Since 2006, as part of the school’s initiative to move towards a Schoolwide Enrichment Model focused on interest-based learning, Renzulli Learning has played a key role in differentiated curriculum and high-

end learning. Upon the completion of the quantitative study by Field (2007), Dr. Bockman added an Enrichment Specialist position to Inman's faculty; Mr. William T. Firesheets, Jr. was appointed in the fall of 2008. Mr. Firesheets shared his reflections on the implementation of SEM and the use of RL at Inman Middle in an interview conducted by Field (personal communication, February 11, 2009).

Mr. Firesheets stated, "Students use Renzulli Learning for a variety of assignments within the classroom, whether compacting, accelerating, as an anchor activity, or follow up to a Type I. Teachers find it very useful in allowing students to investigate an area of interest and create a product or service to be used in the school or community" (personal communication, February 11, 2009).

One of the most impressive Renzulli projects this year was a robotics demonstration by a sixth grade student. He attended a robotics presentation by the Atlanta Police Department on the use of robots by the department's Bomb Squad, and had a great deal of interest in both police bomb work and robots. For a Renzulli project, he followed up on his interest by researching the functions of simple robots. While his poster summarized the Atlanta Police Department's robots, it was his own, hand-built robot that amazed both the students and teachers. He constructed and programmed his own robot to perform simple maneuvers and tasks. It was an impressive display and represented quality work, competent research and scholarship, and creative expression of his interests (W. Firesheets, personal communication, February 11, 2009).

Firesheets gives another example of a pair of students who compacted out of a unit

in language arts,

Another example was a pair of students who compacted out of a unit in Language Arts. While the teacher felt uncomfortable allowing students to complete a project on 'whatever they wanted', she was able to allow these students to do something related to her curriculum area of English/Language Arts. This seventh grade teacher met with the school's Enrichment Specialist who talked with her about how to compact, as she had not done it in the past. The teacher met with the students, and talked with them about their Renzulli Learning profiles. She saw they both shared an interest in writing and an independent study learning style. While the teacher worked with the rest of the class on parts of speech, these students worked with Renzulli's Wizard Project Maker. They engaged in Type II in-depth investigations and researched mysteries, an area of interest for both girls. They also completed a Type III product by co-authoring a book, entitled, *The Girl's Handbook to becoming a Detective or Spy*. This was both educational and entertaining for the students. Through this experience, not only were students able to investigate an area of interest, share in a self-directed independent learning experience, and show mastery of content, but they had fun and created an original piece of fiction, which is available in the school's media center for checkout (W. Firesheets, personal communication, February 11, 2009).

According Mr. Firesheets,

Interest based learning has become a focus at Inman Middle School over the course of the past couple of years. Teachers and administrators have seen an increase in test scores across the board, and students' attitudes toward learning are changing. A difficult task for middle school teachers to accomplish is

to keep students motivated and engaged. Allowing for interest-based learning and the use of Renzulli Learning even for a portion of the day or week is making a difference (personal communication, February 11, 2009).

## Conclusion

John Seely Brown, former Chief Scientist of Xerox Corporation and the director of its Palo Alto Research Center, posed a thought-provoking question, as well as an enlightening answer regarding the acquisition of knowledge, "What do we know that we didn't know 10 years ago? That learning and knowledge are the result of multiple, intertwining forces: content, context, and community" (Seely Brown, 1999, p. ix). If one believes this supposition to be true, then it is important to recognize the potential effects of technologies on student learning, especially in terms of literacy.

The Field (2007) study suggested that using Renzulli Learning 2–3 hours per week for a minimum of 16 weeks has the potential to increase student achievement in terms of reading fluency, reading comprehension, and social studies achievement. Simply put, as evidenced by the qualitative experiences shared in follow-up interviews at both research sites, if students are reading and researching what they enjoy and are engaged and motivated to do so, one may conclude that achievement gains can and will occur.

## References

- Azzam, A. M. (2006). Digital opportunity. *Educational Leadership*, 63(4), 89-92.
- Coiro, J. (2003). Reading comprehension on the Internet: Expanding our understanding of reading comprehension to encompass new literacies. *The Reading Teacher*, 56, 458-464.
- Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly*, 42, 214-257.
- Coiro, J., Knobel, M., Lankshear, C., & Leu, D. J. (Eds.). (2008). *Handbook of research on new literacies*. Mahwah, NJ: Lawrence Erlbaum.
- Field, G. B. (2007). The effect of using Renzulli Learning on student achievement: An investigation of Internet technology on reading fluency and comprehension. Unpublished doctoral dissertation, University of Connecticut, Storrs.
- Garner, R., & Gillingham, M. (1996). *Internet connections in six classrooms: Conversations across time, space, and culture*. Mahwah, NJ: Erlbaum.
- Garner, R., & Gillingham, M. (1998). The Internet in the classroom: Is it the end of transmission-oriented pedagogy? In D. R. Reinking, L. D. Labbo, M. McKenna, & R. Kieffer (Eds.), *Literacy for the 21st century: Technological transformations in a post-typographic world* (pp. 221-231). Mahwah, NJ: Erlbaum.
- Hasbrouck, J. E., & Tindal, G. A. (2005). *Oral Reading Fluency Norms Data*. Retrieved February 10, 2009, from <http://www.readnaturally.com/pdf/oralreadingfluency.pdf>
- Hogarty, K. Y., Lang, T. R., & Kromrey, J. D. (2003). Another look at technology in classrooms: The development and validation of an instrument to measure teachers' perceptions. *Educational and Psychological Measurement*, 63, 139-162.

- Jennings, H., & Lucca, L. (2005). *Summary of Experimental Study of the Ready to Teach Developmental Electronic Field Trip Reader Project, 1-10*. Retrieved September 10, 2006, from <http://orcmacro.com>
- Kramarski, B., & Feldman, Y. (2000). Internet in the classroom: Effects on reading comprehension, motivation and metacognitive awareness. *Educational Media International*, *37*, 149-155.
- Labbo, L. D. (1996). A semiotic analysis of young children's symbol-making in a classroom computer center. *Reading Research Quarterly*, *31*, 356-385.
- Leu, D. J., Jr., Leu, D. D., & Coiro, J. (2004). *Teaching with the Internet: New literacies for new times* (4th ed.). Norwood, MA: Christopher-Gordon.
- Mann, D., & Shafer, E. A. (1997, July). Technology and achievement. *American School Board Journal*. Retrieved February 21, 2009, from <http://www.asbj.com/achievement/ci/ci10.html>
- National Center for Education Statistics. (1999, December). *Teachers' feelings of preparedness*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.
- National Center for Education Statistics. (2000, April). *Teacher use of computers and the Internet in public schools, stats in brief*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.
- Pearson, P. D., Ferdig, R. E., Blomeyer, R. L., & Moran, J. (2005). *The effects of technology on reading performance in the middle-school grades: A meta-analysis with recommendations for policy*. Learning Point Associates/NCEL. Retrieved February 1, 2009, from <http://www.ncrel.org/tech/reading/index.html>
- Prensky, M. (2001). Digital natives, Digital immigrants. *On the Horizon*, *9*.
- Reis, S. M., Eckert, R. D., Schreiber, F. J., Jacobs, J., Briggs, C., Gubbins, E. J., et al. (2005). *The Schoolwide Enrichment Model reading study* (RM05214). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.
- Renzulli, J. S. (1977). *The enrichment triad model: A guide for developing defensible programs for the gifted and talented*. Mansfield Center, CT: Creative Learning Press.
- Renzulli, J. S., & Reis, S. M. (1997). *The schoolwide enrichment model: A how-to guide for educational excellence* (2nd ed.). Mansfield Center, CT: Creative Learning Press, Inc.
- Renzulli, J. S., & Reis, S. M. (2007). A technology based program that matches enrichment resources with student strengths. *International Journal of Emerging Technologies in Learning*, *2*(3).
- Seely Brown, J. (1999). Forward. In R. Ruggles & D. Holthouse (Eds.), *The knowledge advantage: 14 visionaries speak on leveraging knowledge for marketplace success* (p. ix). Dover: Capstone.
- Shaunessy, E. (2007). Attitudes toward information technology of teachers of the gifted: Implications for gifted education. *Gifted Child Quarterly*, *51*, 119-135.
- Siegle, D. (2003). Music Maestro: Some of the best software begins with a blank screen. *Gifted Child Today*, *26*(2), 35-39.
- Siegle, D. (2004). Identifying students with gifts and talents in technology. *Gifted Child Today*, *27*(4), 30-33, 64.
- Siegle, D., & Foster, T. (2001). Laptop computers and multimedia and presentation Software: Their effects on student achievement in anatomy and physiology. *Journal of Research on Technology in Education*, *34*, 29-37.
- Swanson, H. L., Harris, K. R., & Graham, S. (Eds.). (2003). *Handbook of learning disabilities*. New York: Guilford.