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Does mClass Reading 3D Predict Student Reading Proficiency on High-Stakes Assessments?

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ABSTRACT

This quantitative, correlational study investigated the relationship between the North Carolina End of Grade Assessment of Reading Comprehension (NCEOG) and mClass Reading 3D assessment in a North Carolina elementary school. It especially examined the degree to which mClass Reading 3D measures predict scores on the reading comprehension portion of the NCEOG. The study was conducted in two parts. Part one utilized quantitative methods to describe the relationship between mClass Reading 3D and NCEOG based on demographic data. Part two utilized quantitative methods to determine the predictability of mClass Reading 3D measures Oral Reading Fluency (ORF) and Text Reading and Comprehension (TRC) to student scale scores on the NCEOG Assessment of Reading Comprehension. Based on the results of this study, the researcher determined that mClass Reading 3D Oral Reading Fluency (ORF) and Text Reading and Comprehension (TRC) measures statistically, significantly predict student scale scores on the NCEOG Assessment of Reading Comprehension.

Keywords: early reading, curriculum-based assessment, elementary education

INTRODUCTION

Learning to read is not just memorizing letters and sounds, it is a complex process that grows over a lifetime. It requires skilled teachers who understand how to teach the process in spite of any student limitations. Unfortunately, many students leave schools today reading only at a basic level. To create proficient and successful readers, schools should put in place best practices that identify and challenge students individually.

"Children who fail to learn to read will surely fail to reach their full potential," (Hall & Moats, 1999, p. 6). Based on the 2011 National Assessment of Educational Progress (NAEP) scores, the United States is in a reading crisis. Only 66% of fourth graders read at or above a basic level and only 32% of those students read above the proficient level of performance

(United States Department of Education, 2011). According to the National Assessment of Adult Literacy in 2003, there were 30 million people in the United States who were below basic in their reading ability level (National Center for Educational Statistics [NCES], 2003). The authors of *A Nation at Risk* discovered that some 23 million American adults are functionally illiterate by the simplest tests of everyday reading, writing, and comprehension (National Commission on Excellence in Education [NCEE], 1983). People in the United States who are illiterate represent 75% of the unemployed, 33% of mothers receiving Aid to Families with Dependent Children, 85% of juveniles who appear in court, and 60% of prison inmates (Hall & Moats, 1999).

Research has determined that students who are not reading at grade level by the end of the first grade have a high probability of being a poor reader by the end of the fourth grade (Juel, 1988). The Matthew Effect theory suggested that "the rich get richer and the poor get poorer," meaning the literacy gap between students who learn to read early and those who struggle only widens as they get older (Stanovich, 1986, p. 382).

There is evidence to suggest that a significant number of reading difficulties are preventable (Snow, Burns, & Griffin, 1998). Torgesen (2000) estimated that as many as 50% of children who are most at risk for reading failure can be brought to normal levels of performance following effective early reading instruction and interventions (Reschly, 2010). Research also found that if those struggling readers are identified within the first few years of schooling and provided with targeted and intensive instruction, they are more likely to make the progress necessary to catch up with their peers who are reading at grade level (Torgesen, 2004).

To adequately determine the skills to target through instruction and interventions, teachers must accurately assess student needs and subsequently plan and deliver instruction based on that assessment. Otherwise, it is difficult to ensure that all students will master the necessary skills to become proficient readers (Menzies, Mahdavi, & Lewis, 2008). As expectations for reading instruction and the need for individualization of instruction increases, so does the expectation that teachers will regularly collect and make use of assessment data to

inform their classroom instruction (Hupert, Heinze, Gunn, Stewart, & Honey, 2007). For assessment data to be useful to teachers, it must be (a) specific enough to show where students need help, (b) accessible in a timely manner so that teachers can act upon the information, and (c) comprehensible so that it can be translated into practice (Hupert et al., 2007).

Problem Statement

According to a three year trend, the reading scores from this study's focus school decreased from 40% proficient in 2008-2009 to 30% proficient in 2009-2010 and 34% proficient in 2010-2011. This signified that the reading crisis was not only a national issue but a school issue as well.

To combat the problem of decreasing reading proficiency scores in this study's focus school and others like it, the North Carolina Department of Public Instruction (NCDPI) implemented the reading assessment tool, mClass Reading 3D, as a pilot program through the Reading Diagnostic Initiative. This began as a feature of the Ready, Set, Go! initiative from the Budget Act of 2009-2010, Section 7.18(b) that stated,

> The State Board of Education shall investigate and pilot a developmentally appropriate diagnostic assessment for students in elementary grades. This assessment will (i) enable teachers to determine student learning needs and individualize instruction, and (ii) ensure that students are adequately prepared for the next level of coursework as set out by the NC Standard Course of Study. (North Carolina State Board of Education, 2010, p. 10)

This tool provides teachers with benchmark and progress monitoring data that allows them to individualize and adjust their instruction on an ongoing and frequent basis.

It is imperative that students at risk of reading failure are identified and interventions are put into place to catch them up to grade level standards, and the planning of the interventions be driven by assessment results. Since assessments like mClass Reading 3D provide data for

teachers to effectively administer interventions in their classroom, and the purpose of the intervention is for students to grow in their reading achievement and be successful on high-stakes tests like the NCEOG assessment; therefore, it is essential to determine if mClass Reading 3D is an accurate predictor of student success on the NCEOG assessment.

Purpose of the Study

The purpose of this study was to determine if mClass Reading 3D is an effective assessment to utilize as a source of data for guiding instruction and interventions in the reading classroom where the ultimate goal is growth in reading achievement and student success on the NCEOG. This study fulfilled its purpose by investigating the relationship between and predictability of mClass Reading 3D assessment and the NCEOG.

Many studies exist examining the relationship between the Oral Reading Fluency (ORF) measure of mClass Reading 3D and state high-stakes tests; however, there is limited research related to using the mClass Reading 3D assessment as a whole (ORF and Text Reading and Comprehension (TRC)) to predict achievement on high-stakes tests.

NCLB (2001) mandates that each child progresses toward the same standards measured by a statewide system of accountability; therefore, the academic progress of each student should be monitored frequently through the use of effective formative assessment tools. Research on the formative assessment tools and their ability to predict performance on high-stakes tests is necessary for teachers to accurately base instructional decisions on the data provided.

Research Questions

The study was divided into two major components to best fulfill its purpose. This led to the development of two research questions. The first question focused on the relationship between the two assessments. This question would determine what correlations exist between the assessments and study participants. The second question focused on the predictability of the mClass Reading 3D measures to the NCEOG Reading Comprehension assessment. This

question would determine if mClass Reading 3D was an accurate predictor of students success on the NCEOG and ultimately if it was an effective source of data to utilize in instructional and intervention planning.

1. What is the relationship between the mClass Reading 3D assessment and the NCEOG Reading Comprehension assessment?
2. To what extent does the mClass Reading 3D assessment accurately predict student scores on the NCEOG Reading Comprehension assessment?

METHODS

Participants

The potential participants in this study were the 225 students enrolled in third, fourth, and fifth grades in a North Carolina urban elementary school during the 2010-2011 school year. The researcher referred to this as School A. The school had a total enrollment of 443 students. Its ethnic population was made up of 57% African-American, 21% White, 17% Hispanic, and 5% multi-ethnic. School A's special populations consisted of 22% Exceptional Children (EC), 1% Academically and Intellectually Gifted (AIG), and 11% Limited English Proficient (LEP). The free and reduced-priced lunch recipients made up 82% of the school population.

Students were eligible for participation in the study if they met the following criteria: (a) enrolled in Grades 3-5 at School A during 2010-2011 school year, (b) obtained an Oral Reading Fluency (ORF) score and Text Reading and Comprehension (TRC) score from mClass Reading 3D End of Year (EOY) benchmark assessment in May 2011, and (c) obtained a score from the reading comprehension portion of the North Carolina End of Grade (NCEOG) assessment in May 2011. Students identified as EC and LEP were included in the study as long as they were not tested using the NCEXTEND 1 or 2 assessment for reading.

The study participants consisted of 143 third, fourth, and fifth grade students in School A meeting the study eligibility requirements. Table 1 shows the demographics of the selected

participants for the study as compared to School A and Grades K-5 in School A's school district. The data were retrieved through NCWISE and North Carolina TetraData online databases.

Table 1

Demographics of 2010-2011 Study Participants Compared to School and District

Category	Study participants	School A (Grades 3-5)	School district (Grades 3-5)
# of Students	143	225	15442
# in Third Grade	60	87	2644
# in Fourth Grade	46	73	2609
# in Fifth Grade	37	65	2681
# Black	89	135	2937
# White	26	48	10060
# Hispanic	19	31	1643
# Multi-Racial	9	11	527
# Male	70	114	7978
# Female	73	111	7464
# Academically Gifted	4	4	1145
# Exceptional Children	23	42	1918
# Limited English Proficiency	4	17	1007

Instruments

mClass Reading 3D is a formative assessment tool which combines the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessment with the Text Reading and Comprehension (TRC) assessment. The measures include benchmark assessments that are administered three times a year, as well as, ongoing assessments for progress monitoring more frequently, focusing on students at risk (Reading 3D Brochure, 2009).

DIBELS are a set of procedures and measures for assessing the acquisition of early literacy skills from kindergarten through sixth grade. The measures were designed for use in identifying children experiencing difficulty in basic early literacy skills in order to provide support early and prevent the occurrence of later reading difficulties. DIBELS were designed to evaluate the effectiveness of interventions for those children receiving support to maximize learning growth (Dynamic Measurement Group, 2008).

mClass Reading 3D requires third, fourth, and fifth grade students to be benchmark assessed on the Oral Reading Fluency (ORF) measure of DIBELS. The ORF measure scores

students based on their accurate and fluent reading of three grade level passages in three one-minute probes. mClass Reading 3D takes the median of all three probes to determine an overall score. The end of year normed cut point scores are: third grade - 110 words per minute, fourth grade - 118 words per minute, and fifth grade - 124 words per minute (Dynamic Measurement Group, 2008).

Text Reading and Comprehension Assessment or the TRC assessment is a digital form of reading records (RR). During the TRC, students are asked to read a book and complete one to two comprehension tasks. The teacher observes and records the student's oral reading behaviors through the administration of RRs to determine reading accuracy percentage. The comprehension components help teachers determine whether the student understands the meaning of the text. The accuracy percentage and comprehension component(s) together determine the student's overall instructional reading level (Text Reading and Comprehension, 2010). The instructional reading level is represented by a letter (A-Z) from the Fountas and Pinnell (2010) leveling system. The end of year normed cut point scores are: third grade - level P (311), fourth grade - level S (410), and fifth grade - level U (506) (Wireless Generation, 2010).

The NCEOG Assessment of Reading Comprehension is administered each year to students in Grades 3-8 in the month of May. The reading comprehension measures of the NCEOG are designed to measure student performance on grade level standards and objectives based on the North Carolina English Language Arts Standard Course of Study (NCDPI, 2011). The test is comprised of eight reading selections with corresponding questions for each selection. The reading selections vary from literary to informational text.

NCEOG scores are reported in achievement levels ranging from Level I to Level IV. Students must achieve at least a Level III to show grade level reading comprehension skills and to be considered proficient. The cut point scores for Level III are: 338 in third grade, 343 in fourth grade, and 349 in fifth grade (NCDPI, 2011).

DATA COLLECTION AND ANALYSIS

This quantitative, correlational study utilized a predictive design to examine the relationship between and determine predictability of the scores on mClass Reading 3D measures and the reading comprehension portion of the NCEOG assessment. The study was conducted in two components in order to best address the two research questions.

The researcher collected archived data about the 143 study participants. The data collected included 2010-2011 demographic and NCEOG assessment data from NCWISE and TetraData, the state student data collection and data analysis systems, along with ORF and TRC assessment scores from mClass Reading 3D. These data were coded according to category in preparation for data analysis.

Descriptive and inferential statistics were both used to analyze the data collected from the study participants to determine the answers to the study's research questions. These analyses were calculated by grade level due to both mClass Reading 3D ORF scores and NCEOG scale scores changing achievement ranges at each grade level.

Component one of the study focused on determining the relationship that exists between mClass Reading 3D and the reading comprehension portion of the NCEOG. The data collected and categorized were entered into the Statistical Package for the Social Sciences (SPSS) for analysis. Descriptive statistics (frequency counts and measures of central tendencies), measures of variability (standard deviations), and Pearson correlations (by gender and ethnicity) were calculated to determine any associations/relationships between the two assessments.

Component two of the study focused on mClass Reading 3D's predictive ability for student success on the reading comprehension portion of the NCEOG. The assessment data collected and analyzed in component one from the ORF and TRC measures of mClass Reading 3D and NCEOG were used in SPSS to calculate multiple regression analyses. The analyses determined to what extent mClass Reading 3D predicted student scale scores on the NCEOG.

RESULTS

Component One – The Relationship

The Relationship Analysis of the descriptive statistics, Table 2, in component one of this study brought to light several observations about the relationships that existed between mClass Reading 3D and NCEOG. All three grade level mean NCEOG scale scores were equivalent to a proficiency level of II, limited understanding of grade level standards; mean ORF scores were equivalent to just below grade level proficiency; and mean TRC scores for third and fourth grades were equivalent to just below grade level proficiency, while fifth grade was equivalent to way below grade level proficiency. This revealed, on average, the grade levels had equivalent proficiency levels on the NCEOG, ORF, and TRC, with the exception of fifth grade TRC scores.

The researcher utilized the frequency counts of the demographic variables of gender and ethnicity to determine mean scores for each, helping to further analyze the relationship that existed between the two assessments. In this study, female participants scored higher means and proficiency levels than male participants on the NCEOG, ORF, and TRC assessments in Grades 4 and 5, while males scored higher on all assessments in the third grade. Hispanic participants scored higher means and proficiency levels than other ethnicities on the fourth grade ORF and TRC and fifth grade NCEOG, ORF, and TRC. Multi-Racial participants scored higher means and proficiency levels on the third and fourth grade NCEOG, while White participants scored higher means and proficiency levels on the third grade ORF and TRC.

Table 2

Descriptive Statistics for Participants NCEOG Scale Score, ORF Score, and TRC Score

	Grade Level	Category	n	Mean	Median	Range	SD
NCEOG							
	Third	All	60	331.78	334	116	15.17
		Black	38	329.71	332	109	16.87
		White	10	336.00	338.00	47	14.18
		Hispanic	9	333.56	335.00	20	7.20
		Multi-Racial	3	338.67	341.00	25	12.66
		Male	30	334.40	335.50	47	11.62
		Female	30	329.17	333.50	104	17.87
		EC	10	318.00	322.00	97	26.64
		AIG	2	352.00	352.00	20	14.14
	Fourth	All Students	46	335.65	338.50	123	21.32
		Black	29	334.48	338.00	106	18.44
		White	9	332.67	344.00	113	34.64
		Hispanic	5	341.20	342.00	13	5.45
		Multi-Racial	3	346.67	339.00	31	16.86
		Male	23	329.83	338.00	104	247.78
		Female	23	341.48	339.00	40	9.32
		EC	9	315.00	333.	104	41.26
		LEP	2	339.50	339.50	7	4.95
	Fifth	All Students	37	347.48	349.00	26	6.63
		Black	22	347.64	347.00	26	6.99
		White	7	347.29	348.00	20	7.32
		Hispanic	5	349.00	351.00	16	6.44
		Multi-Racial	3	348.00	349.00	11	5.57
		Male	17	345.88	345.00	26	8.15
		Female	2	349.40	349.00	16	4.64
		EC	4	342.75	344.50	14	6.08

	Grade Level	Category	n	Mean	Median	Range	SD
ORF							
	Third	All Students	60	88.72	83.50	138	30.91
		Black	38	82.79	79.50	134	79.50
		White	10	106.90	103.50	105	34.04
		Hispanic	9	100.67	99.00	75	23.03
		Multi-Racial	3	67.33	74.00	58	29.57
		Male	30	90.20	84.50	128	32.64
		Female	30	87.23	81.50	125	29.57
		EC	10	74.70	79.00	103	35.39
		AIG	2	153.00	153.00	22	15.56
	Fourth	All Students	46	100.61	103.50	158	34.73
		Black	29	100.07	101.00	148	31.47
		White	9	98.22	94.00	152	49.21
		Hispanic	5	106.00	114.00	64	25.93
		Multi-Racial	3	104.00	104.00	92	46.00
		Male	23	87.70	90.00	148	36.12
		Female	23	113.52	105.00	122	28.52
		EC	9	64.56	58.00	119	40.74
		LEP	2	118.50	118.50	9	6.36
	Fifth	All Students	37	116.14	120.00	114	33.96
		Black	22	115.68	121.50	107	31.79
		White	7	111.43	111.00	98	31.95
		Hispanic	5	137.40	150.00	114	45.88
		Multi-Racial	3	95.00	109.00	58	31.43
		Male	17	109.59	107.00	109	35.44
		Female	20	121.70	123.50	112	32.50
		EC	4	112.75	103.50	88	37.59
TRC							
	Third	All Students	60	309.35	310.00	15	3.65

Grade Level	Category	n	Mean	Median	Range	SD
	Black	38	308.74	309.50	13	3.49
	White	10	311.90	312.00	12	3.60
	Hispanic	9	308.33	308.00	8	2.45
	Multi-Racial	3	311.67	314.00	11	5.86
	Male	30	309.97	310.00	13	3.69
	Female	30	308.73	308.50	15	3.57
	EC	10	307.60	307.00	13	4.90
	AIG	2	316.00	316.00	0	.00
Fourth	All Students	46	409.46	411.00	11	3.44
	Black	29	409.52	411.00	11	3.33
	White	9	408.89	412.00	11	4.40
	Hispanic	5	410.60	412.00	5	2.19
	Multi-Racial	3	408.67	410.00	8	4.16
	Male	23	408.83	411.00	11	3.89
	Female	23	410.09	411.00	9	2.86
	EC	9	405.78	404.00	11	4.68
	LEP	2	411.00	411.00	2	1.41
Fifth	All Students	37	504.76	505.00	5	1.44
	Black	22	504.73	505.00	4	1.35
	White	7	504.86	505.00	3	1.35
	Hispanic	5	505.00	506.00	5	2.24
	Multi-Racial	3	504.33	504.00	3	1.53
	Male	17	504.59	505.00	5	1.42
	Female	20	504.90	506.00	4	1.48
	EC	4	505.25	505.00	1	.50

Note. EC–Exceptional Children. Limited English Proficient (LEP) and Academically and Intellectually Gifted (AIG) students were not included because of a low number of participants (n=1).

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Overall, based on the descriptive statistics, it could be stated that an observed relationship does exist between NCEOG and mClass Reading 3D assessments. This relationship is revealed in several commonalities: (a) the participants' proficiency levels are parallel between the two assessments in Grades 3, 4, and 5; (b) consistent growth data for males and females in all three grade levels on both assessments; and (c) consistent proficiency levels and mean scores for Black participants in all three grade levels on both assessments (the highest number of participants in all three grade levels, but never had the highest mean score at any grade level on any of the assessments examined in this study.).

Analysis of the inferential statistics in this study also brought to light several observations. These statistics were used to further determine the relationships and predictability that existed between NCEOG and mClass Reading 3D. The initial observations based on the descriptive statistics appeared to show a relationship existed between the two assessments; but the rest of the analysis determined to what extent the relationship existed in terms of correlation, statistical significance, and predictability. The researcher utilized the gender and ethnicity frequency counts and descriptive statistics to determine the correlation coefficients for each; but due to the low number of cases for the Hispanic and Multi-Racial ethnicities, the researcher combined them to form the Other ethnicity variable when running the Pearson correlation statistics.

Table 3 presents the results of the Pearson correlations which determined that there was statistical evidence of a positive correlation and statistically significant relationships between NCEOG and mClass Reading 3D scores at all three grade levels involved in the study. As the correlation analysis was examined more closely, it revealed that the strongest relationship for each grade level with NCEOG was the ORF scores.

Table 3

Pearson Correlation Matrix for Participant Assessment Scores

		NCEOG	ORF	TRC	
Third Grade					
NCEOG	Pearson Correlation				
ORF	Sig. (2-tailed)	1			
TRC	N				
NCEGO	Pearson Correlation	.854*		1	
ORF	Sig. (2-tailed)	.000			
TRC	N	59		.59	
NCEOG	Pearson Correlation	.597*		.556*	
ORF	Sig. (2-tailed)	.000		.000	1
TRC	N	59		59	
Fourth Grade					
NCEOG	Pearson Correlation	.676*			
ORF	Sig. (2-tailed)	.000		1	
TRC	N	43			
NCEOG	Pearson Correlation	.676*			
ORF	Sig (2-tailed)	.000		1	
TRC	N	43			
NCEOG	.Pearson Correlation	.584		.676*	
ORF	Sig. (2-tailed)	.000		.000	1
TRC	N	43		43	
Fifth Grade					
NCEOG	Pearson Correlation				
ORF	Sig. (2-tailed)	1			
TRC	N				
NCEOG	Pearson Correlation	.669*			
ORF	Sig. (2-tailed)	.000		1	

		NCEOG	ORF	TRC
TRC	N	36		
NCEOG	Pearson Correlation	616*	.643*	
ORF	Sig. (2-tailed)	.000	.000	
TRC	N	36	36	

Note. *Correlation is significant at the 0.01 level (2-tailed).

Table 4 presents the results of the Pearson correlations broken down by ethnicity and gender. Analysis of the table found male and female participants in all three grade levels showed a positive correlation and statistically significant relationship between the NCEOG and mClass Reading 3D assessments, which is consistent with the observed data in the descriptive statistics. All ethnicities, except the following variables, revealed a positive correlation and statistically significant relationship between the two assessments: third and fourth grade Other ethnicity, and fifth grade White ethnicity. This was an interesting find in relation to the descriptive statistics data which revealed Hispanic (which was part of the Other ethnicity) participants had the highest proficiency levels in fourth grade ORF and TRC assessments. The Pearson correlation test does show a positive correlation between Hispanic participants' assessment scores; it was just not found to be statistically significant.

In all three grade levels, the female participants had the highest correlation between NCEOG, ORF, and TRC, with the exception of third grade males who had a higher correlation between NCEOG and TRC than females. The third and fourth grade White participants had the highest correlation between NCEOG, ORF, and TRC, and fifth grade White participants between NCEOG and TRC. The fifth grade Other ethnicity participants had the highest correlation between NCEOG and ORF.

Table 4

Pearson Correlation Matrix for Participant Assessment Scores by Ethnicity and Gender

	Variable	Assessment	NCEOG	ORF	TRC
Third Grade					
	Black (N=37)	NCEOG	1	.595**	.554**
		ORF	.595**	1	.543**
		TRC	.554**	.543**	1
	White (N=10)	NCEOG	1	.861**	.680**
		ORF	.861**	1	.747*
		TRC	.680**	.747*	1
	Other (N=12)	NCEOG	1	.497	.654*
		ORF	.497	1	.213
		TRC	.654*	.213	1
	Male (N=30)	NCEOG	1	.624**	.599**
		ORF	.624**	1	.663**
		TRC	.599**	.663**	1
	Female (N=29)	NCEOG	1	.713**	.584**
		ORF	.713**	1	.419*
		TRC	.584**	.419*	1
Fourth Grade					
	Black (N=28)	NCEOG	1	.674**	.608**
		ORF	.674**	1	.762**
		TRC	.608**	.762**	1
	White (N=8)	NCEOG	1	.757*	.706
		ORF	.757*	1	.740*
		TRC	.706	.740*	1
	Other (N=7)	NCEOG	1	.732	.609
		ORF	.732	1	.890**
		TRC	.609	.890**	1

	Variable	Assessment	NCEOG	ORF	TRC
	Male (N=21)	NCEOG	1	.434*	.560**
		ORF	.434*	1	.796**
		TRC	.560**	.796**	1
	Female (N=22)	NCEOG	1	.845**	.638**
		ORF	.845**	1	.770**
		TRC	.638**	.770**	1
Fifth Grade					
	Black (N=22)	NCEOG	1	.740**	.493*
		ORF	.740**	1	.551**
		TRC	.493*	.551**	1
	White (N=7)	NCEOG	1	.441	.885**
		ORF	.441	1	.665
		TRC	.885**	.665	1
	Other (N=7)	NCEOG	1	.745	.866*
		ORF	.745	1	.887**
		TRC	.866*	.887**	1
	Male (N=16)	NCEOG	1	.650**	.562*
		ORF	.650**	1	.483
		TRC	.562*	.483	1
	Female (N=20)	NCEOG	1	.732**	.809**
		ORF	.732**	1	.757**
		TRC	.809**	.757**	1

Note. *p<.05, **p<.01.

Component Two - Predictability

The second research question of this study refers to the extent that the mClass Reading 3D assessment predicts student scores on the NCEOG. To answer this question, the researcher analyzed results from a multiple regression test found in Table 5. This test revealed that in all three grade levels, mClass Reading 3D statistically significantly predicted the student scores on the NCEOG. Third grade had the strongest predictability by determining that both portions of mClass Reading 3D, ORF and TRC, added to the statistical significance of the prediction for student scores on the NCEOG; whereas, in fourth grade only the ORF portion, and in fifth grade only the TRC portion of mClass Reading 3D, added statistical significance of the predication of student scores on the NCEOG. Due to the exclusion of some gender and ethnicity variables at all three grade levels, the researcher was unable to determine the predictability of mClass Reading 3D to NCEOG according to the gender and ethnicity variables.

Table 5

Summary of Standard Multiple Regression for Participants

	Variables	B	SE_B	B	t	Sig.
Third Grade						
	(Constant)	48.583	89.303	.544	.589	
	ORF Score	.180	.035	.547	5.206	.000
	TRC Score	.866	.294	.309	2.946	.005
Fourth Grade						
	(Constant)	183.711	156.829	1.171	.248	
	ORF Score	.121	.039	.553	3.078	.004
	TRC Score	.349	.390	.161	.894	.376
Fifth Grade						
	(Constant)	-855.565	350.345		-2.442	.020
	ORF Score	.053	.030	.283	1.765	.087
	TRC Score	2.373	.699	.545	3.393	.002

Note. B=unstandardized regression coefficient; SE_B=standard error of the coefficient; β=standardized coefficient (beta).

The multiple regression analysis revealed findings that correlate to the descriptive statistics and Pearson correlation analysis, where in all three grade levels the proficiency levels were consistent between NCEOG and mClass Reading 3D, the Pearson correlation determined consistent positive correlations and statistical significance between the two assessments, and the multiple regression revealed mClass Reading 3D did statistically significantly predict scores on the NCEOG.

Overall, based on the descriptive and inferential statistics, it could be stated that a relationship does exist between NCEOG and mClass Reading 3D assessments, and at all three grade levels included in the study, mClass Reading 3D student scores serve as a predictor of student success on the NCEOG Reading Comprehension assessment.

All three grade level participants, based on the descriptive and inferential statistics, had several consistent findings. In third grade, overall, the data clarify that all three assessments have positive correlations and statistically significant relationships among the third grade participants as a whole. Although close in correlation coefficients, the strongest correlation for all third grade participants was between NCEOG and ORF scores where r=.654.

When the researcher broke down the data by ethnicity and gender, there were some noticeable observations. The Female and White variables held the highest correlation statistics for the NCEOG and ORF scores. The Male and White variables held the highest correlation for NCEOG and TRC scores and for the ORF and TRC scores, of those variables that were statistically significant.

The multiple regression test revealed that the ORF and TRC scores statistically significantly predicted NCEOG scale scores, $F(2,55)=38.728$, $p<.05$, adj. $r^2=.570$. Both ORF and TRC scores added statistically significantly to the prediction of NCEOG scale scores, $p<.05$.

In fourth grade, overall, the data clarify that all three assessments have positive correlations and statistically significant relationships among the fourth grade participants as a whole.

Although close in correlation coefficients, the strongest correlation for all fourth grade participants with the NCEOG was ORF scores where r=.676.

When the researcher disaggregated the data by ethnicity and gender, there were some noticeable observations. The Female and White variables held the highest correlation statistics between the NCEOG and ORF scores and the NCEOG and TRC scores. The Male and Black variables held the highest correlation for ORF and TRC scores of those variables that were statistically significant.

The multiple regression test revealed that the ORF and TRC scores statistically significantly predicted NCEOG scale scores, $F(2,40)=17.559$, $p<.05$, adj. $r^2=.441$; however, only the ORF score variable added statistically significantly to the prediction of NCEOG scale scores ($p=.004$, $p<.05$) because the TRC score variable p value was greater than .05 ($p=.376$).

In fifth grade, overall, the data clarify that all three assessments have positive correlations and statistically significant relationships among the fifth grade participants as a whole. Although close in correlation coefficients, the strongest correlation for all fifth grade participants with the NCEOG was ORF scores where r=.669.

When the researcher disaggregated the data by ethnicity and gender, there were some noticeable observations. The Female gender and Other ethnicity variables held the highest correlation statistics between the NCEOG and ORF scores and ORF and TRC scores of the variables that were statistically significant. The Female gender and White ethnic variables held the highest correlation for NCEOG and TRC scores.

The multiple regression test revealed that the ORF and TRC scores statistically significantly predicted NCEOG scale scores, $F(2,33)=24.990$, $p<.05$, adj. $r^2=.578$; however, only the TRC score variable added statistically significantly to the prediction of NCEOG scale scores ($p=.002$, $p<.05$) because the ORF score variable p value was greater than .05 ($p=.087$).

Overall, there was a positive correlation between NCEOG and mCLASS Reading 3D, revealing a relationship between the two assessments. Fourth grade had the strongest

correlation between NCEOG and ORF with r=.676, and fifth grade had the strongest correlation between NCEOG and TRC with r=.616. This provides the information necessary to answer the research question "What is the relationship between the mCLASS Reading 3D assessment and the NCEOG Reading Comprehension assessment?"

The analyses also revealed that in all three grade levels both the ORF and TRC scores statistically significantly predicted the student scale scores on the reading comprehension portion of the NCEOG. This determines that mCLASS Reading 3D statistically significantly predicted the student scale scores on the reading comprehension portion of the NCEOG. Grade 3 had the strongest predictability by revealing that the ORF (p<.05) and TRC (p=.005, p<.05) scores from mCLASS Reading 3D added to the statistical significance of the prediction for NCEOG scale scores in their grade level; whereas, Grade 4 revealed only the ORF (p=.004, p<.05) scores from mCLASS Reading 3D added to the statistical significance of the predication of the NCEOG scale scores for their grade level. Also, Grade 5 revealed only the TRC (p=.002, p<.05) scores from mCLASS Reading 3D added to the statistical significance of the predication of the NCEOG scale scores for their grade level. This provides the information necessary to answer the research question "To what extent does the mClass Reading 3D assessment accurately predict student scores on the NCEOG Reading Comprehension assessment?"

DISCUSSION

Pellegrino (2004) stated,

> If social and public goals regarding academic achievement are to be attained, then we must make more effort to improve assessment, especially assessment practices that can directly support enhanced outcomes for students. Thus assessment can become part of the solution rather than be part of the problem. (p. 5)

As increased accountability equates to increased assessment in schools, it is imperative to ensure that the assessments align and directly relate to instruction and intervention.

Educational researchers, for many years now, have investigated how instruction, intervention, and student scores on formative assessments relate to and predict student results on high-stakes assessments.

This study revealed a positive relationship between the two assessments and that mClass Reading 3D ORF measure statistically and significantly predicts student scale scores on the NCEOG reading comprehension assessment provided further and new research in multiple areas. mClass Reading 3D's data can be utilized to effectively instruct and intervene in early literacy areas providing confidence to educators to plan and deliver instruction and interventions that identifies student deficits and builds proficient readers. mClass Reading 3D and its relationship and predictability to the NCEOG adds to the research base of a new assessment that is expanding across North Carolina. The accurate data for instruction and interventions provided by this study will increase student success on the NCEOG. This study provided similar results as past studies (Barger, 2003; Buck and Torgesen, 2003; Wood 2006) of a positive correlation and statistically significant relationship between a state high-stakes assessment (in this study the NCEOG) and the ORF portion of the mClass Reading 3D assessment. The data in this study adds new research to the field on the TRC assessment's correlation and predictability to high-stakes testing (NCEOG) that currently does not exist.

Limitations

Even though this study's results were consistent with previous research, the findings do have limitations that should be considered. The school in the study was the only school in the district at the time that was using mClass Reading 3D for all students in Grades 3-5. Since the results were from only one elementary school in North Carolina, creating a small sample size, the ability to generalize results may be limited. If the study were to be replicated with a larger sample size, it could provide more generalizability of the results.

The data gathered for analysis only included the EOY benchmark scores from mClass Reading 3D. Since the EOY benchmarks for mClass Reading 3D occurred only a few weeks

prior to the NCEOG assessment, there was little time in between to change the outcomes of NCEOG based on the results of mClass Reading 3D. This is a potential limitation that could be overcome in future studies by using all three benchmark periods within the assessment year for prediction of student scores on the NCEOG.

This study was cross-sectional, examining one set of participants at one point in time. The data were collected from participants during the 2010-2011 school year. The observations and conclusions in this study are not longitudinal. This limitation could be overcome in future studies by replicating the study as a longitudinal study.

There were several extraneous factors out of the researcher's control that could have impacted student scores on mClass Reading 3D and/or NCEOG: (a) the teachers utilized the same standards, curriculum, and resources; however, they each had their own individual way of incorporating these into daily instruction; (b) the teachers used different instructional and management strategies, creating different classroom climates; and (c) the students, even though they were from the same neighborhoods, each had different home support systems and backgrounds that were reflected in their classroom environments.

CONCLUSIONS

In response to the federal and state expectations and initiatives in student accountability, there is a growing need for the use of formative assessments to inform instruction and best meet needs of all students. State and district wide initiatives promote district, school, and classroom data collection to guide data-driven instructional decision making through daily instruction and interventions. Therefore, the formative assessment data should be predictive of the student success on the high-stakes assessments that directly correlate to state, district, and school accountability targets.

While this study was not void of limitations, it may hold significance to those stakeholders considering using or already using mClass Reading 3D in the State of North

Carolina. Overall findings of this study have implications on current and future initiatives such as the Read to Achieve bill in North Carolina, school and classroom instructional decisions, and student success on the NCEOG. The findings of this study are consistent with previous research suggesting the ORF portion of mClass Reading 3D can be used to predict performance on high-stakes assessments of reading. The findings also added research to an area that was lacking, revealing that the TRC portion of mClass Reading 3D statistically significantly predicated student scores on the NCEOG.

Results of the study clearly supported the use of mClass Reading 3D in third, fourth, and fifth grades as a data source for determining data-driven instruction and interventions to use for prediction of reading proficiency on the NCEOG. This provides educators with the confidence to utilize the mClass Reading 3D data as an effective source of instructional decision making.

Results of this study should be of interest to all educators. The results, in part, reveal the importance of formative assessments like mClass Reading 3D being predictors of performance on high-stakes assessments like NCEOG in order to inform educational decisions. The study findings also provide opportunities for educators to adjust daily instruction and improve student outcomes by providing data-driven interventions. This study should add strength to the educational field and urge researchers to continue with the recommendations for future research, ensuring mClass Reading 3D continues to hold a statistically significant relationship and be a predictor of NCEOG scores, even as initiatives and standards change over time.

This study has several implications for education. As the nation continues to strive towards student accountability through formative and high-stakes testing, it is important that the assessments align and prepare students for success on statewide accountability targets. The results of this study reveal that mClass Reading 3D has a statistically significant relationship and is predictive of the high-stakes test in reading for North Carolina, NCEOG, in Grades 3-5. This shows that the ORF and TRC portion of the mClass Reading 3D assessment assesses

skills necessary for third through fifth grade students to show proficiency on the reading comprehension portion of the NCEOG. It also determines that the ORF and TRC contain data that can provide accurate progress monitoring and interventions towards student success on grade level expectations.

The data in this study are historical, which helps to form a comparative baseline for current and future implications. Since this study's data were collected, several statewide initiatives have taken place to further emphasize the importance of its results. North Carolina has put into action an Elementary and Secondary Education Act (ESEA) flexibility waiver which provides flexibility on specific requirements of NCLB (NCDPI, 2012), which included a shift from federal accountability sanctions (Annual Yearly Progress) to state accountability designations by Annual Measureable Objectives (AMO). The school in this study moved from the AYP sanction of Corrective Action to the AMO designation of priority school. As a result, they received the School Improvement Grant (SIG) which created an administrative and staff turnover and implementation of new initiatives in order to raise student proficiency on grade level standards as reflected on the NCEOG. The school continued to implement mClass Reading 3D school-wide, and their reading proficiencies on the NCEOG increased from 34% in 2010-2011 to 46% in 2011-2012, which, after this study, it can be determined that mClass Reading 3D was one of the contributing factors to the increase in reading proficiency scores.

North Carolina also expanded the Pilot program for mClass Reading 3D to kindergarten through third grade statewide in 2012-2013, as part of the Excellent Public Schools Act Read to Achieve House Bill 950/S.L. 2012-142 Section 7A. This study adds to the support of the program expansion by providing statistical evidence that mClass Reading 3D is a predictor of student success on the NCEOG and can be utilized as data to drive instruction and interventions.

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