A STUDY OF THE EFFECTIVENESS OF SELECTED INSTRUCTIONAL STRATEGIES FROM THE MARZANO CAUSAL TEACHER EVALUATION MODEL IN A THIRD GRADE CLASSROOM AT AN ONLINE CHARTER SCHOOL

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Rene Bernel

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A STUDY OF THE EFFECTIVENESS OF SELECTED INSTRUCTIONAL STRATEGIES FROM THE MARZANO CAUSAL TEACHER EVALUATION MODEL IN A THIRD GRADE CLASSROOM AT AN ONLINE CHARTER SCHOOL

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Thesis

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CHAPTER I
INTRODUCTION

Online learning is a relatively new strategy that is becoming more established in both higher education, and the K-12 setting. Although K-12 eSchools have become an increasingly popular choice for families, there has not been an equal growth when it comes to research for K-12 eSchools. As of 2011, the Ohio eSchool Coalition has listed 27 K-12 public eSchools in Ohio alone. According to Anderson (2011), with the growth of online learning as an educational strategy, many are concerned with the quality of learning within this new environment.

Teaching and learning should focus on the interactions between the teacher and students and students and their peers. In the traditional environment, teachers present a lesson while directly observing their students. The teachers are able to see individual students, read their body language and adjust their learning activities as necessary. In my experience, these valuable observations are not as easily accomplished in online classes.

While both teachers and students often have web cameras and programs that allow live video feeds in online classes, it is not common practice to use them in many online classes. Many families choose eSchooling because of their flexible, asynchronous schedule, but even in live classes it is still difficult to use video capabilities. With teachers and students in separate locations, to observe an entire class of students would...
require viewing a separate video feed for each student. Most online classes have 30+ students and the amount of bandwidth that would be required to support that task is more than they usually have, so most lectures are typically uploaded picture slides with chat and audio.

Little research has been done to identify, evaluate, and promote best teacher practices specifically in online classrooms, despite the dramatic differences between traditional and online environments. Even less research has been completed in online classrooms for K-12 students.

In order to fill the gap in research, this study will focus on instructional strategies in the K-12 online classroom. In a third grade classroom at an online charter school, the effectiveness of three strategies will be measured. The three strategies of tracking student progress, student discussion, and feedback have been selected because they have been proven to be effective teaching strategies by many different researchers and are promoted in traditional classrooms (Busch, & Espin, 2003; Conrad & Donaldson, 2004, Gobet, Lane, Croker, et al. 2001). By identifying their effectiveness in online classrooms, K-12 eSchools can implement these strategies and improve student achievement.

Conceptual Framework

This action research project focuses on examining: 1) Teacher evaluation for facilitating teachers’ professional development 2) Examination of the Marzano Causal Teacher Evaluation Model, and 3) Social Constructivism and the interaction between teachers and students as fundamental elements to the learning process.
Based on Vygotsky’s (1978) work, social constructivism views learning as an active process and teachers as facilitators of learning. From this standpoint, the key role of the teacher is to develop a learning community in order to create an interaction between task, instructor, and learner (Holt and Willard-Holt 2000). Student-student interaction is critical because it allows students to construct their own knowledge (Moore, 2007; Stahl, 2005). Interaction between peers within a safe community of learners is especially important in an online environment. (Guldberg & Pilkington, 2006; Mäkitalo-Siegl, 2008). Zhang (2005) found that participants performed better and had higher levels of satisfaction in an interactive e-learning environment than students that were in a less interactive e-learning environment.

Within the framework of social constructivism, teacher evaluation and professional development should lead to positive changes in teachers’ classroom practices that lead to positive change in students’ learning outcomes (Guskey, 2002; Kirkpatrick & Kirkpatrick, 2005; Marzano, 2000). In a review of different lists of characteristics of professional development, Guskey (2003) found the most frequently cited characteristic was enhancement of teachers’ content and pedagogical knowledge. A study conducted by Mullens, Murnane and Willett (1996), also found a significant relationship between Teacher Knowledge and Teacher Practices for improving Student Achievement. Evaluation is also an assessment of merit and serves as an accountability tool. Stufflebeam (2007) suggested that the two major reasons to do evaluation are for accountability and to develop new knowledge that can and should be used to improve
practice. If there were no use for the evaluations, they would not be worth the effort of completing.

The 2002 No Child Left Behind Act and, more recently, President Obama’s Race to the Top have focused on the idea of growing teacher effectiveness. Federal initiatives and state legislation have set the requirement for accountability in education. Many recent studies have supported connecting high quality, effective teaching to increases in student achievement (Goldhaber, 2002; Hanushek, Kain, O’Brien, & Rivkin, 2005).

The Marzano Research Laboratory is one of many groups of people who have tried to translate Social Constructivist theories into specific classroom strategies through research. The Marzano Causal Teacher Evaluation Model was designed to measure teacher effectiveness through increases in student achievement. It is based on studies conducted at Marzano Research Laboratory (MRL) over the past five decades (Marzano, 2012). The Marzano Causal Teacher Evaluation Model contains a total of 60 elements across four domains. As indicated in Figure 1, Domain 1: Classroom Strategies and Behaviors contains 41 elements, Domain 2: Planning and Preparing contains 8 elements, Domain 3: Reflecting on Teaching contains 5 elements, and Domain 4: Collegiality and Professionalism contains 6 elements (Marzano, 2011). See Figure 1.
What differentiates the Marzano Evaluation Model from some other popular models is its emphasis on Domain 1, with strategies from *The Art and Science of Teaching* (Marzano, 2011). Although there are 4 domains, Domain 1 contains 41 out of the total of 60 elements. The elements were selected as classroom strategies that have been shown in MRL studies in traditional courses to have the most direct effect on student growth and performance.
The Marzano Causal Teacher Evaluation Model (herein referred to as the Marzano Evaluation Model) is based on the results from action research on instructional strategies identified by Marzano through meta-analysis to increase student learning gains. The Marzano Evaluation Model aligns with state teaching standards and ties student achievement to teacher evaluation using classroom data (Marzano, 2012). As a result, the Marzano Evaluation Model is helpful for examining the cause and effect relationship between instructional strategies and student achievement that recent federal initiatives have demanded.

Statement of the Problem

The current assumption in education is that traditional professional development and teacher evaluation models appropriate in the traditional environment are appropriate in an online environment. The Marzano Causal Teacher Evaluation Model is an example of this. Although it is based on research from traditional schools, it has been accepted and adapted for use in teacher evaluation in school districts in several states like Arizona, Florida, New Jersey, New York, Oklahoma, and Virginia (Marzano, 2012). The states have a variety of school districts including traditional, integrated, and completely digital. All school districts within each state have been given the same teacher evaluation models, regardless if the learning takes place in an online setting or a face-to-face classroom. The model has been studied as to its effects on the use of technology (i.e., interactive whiteboards), but currently there has been little research focusing on a completely online school.
Current research in online courses is usually aimed for higher education. There are several differences in the needs and behaviors of college and elementary students, which is why there is different training and certification required to teach each level of student. Research in online courses for the K-12 student is limited and “lacks a critical look at the existing research on the teachers’ roles and competencies with respect to online teaching” (Baran, Correia, & Thompson, 2011). Studies that do exist often focus on students taking selected distance courses in addition to traditional classes, rather than being enrolled in a completely online school, or teachers learning strategies to teach traditional classes through online professional development (Babb, Stewart, & Johnson, 2010; Douglas-Faraci, 2010; Harris, Mishra, & Koehler, 2009).

The differences in environment in traditional and online courses require research in the effectiveness of strategies in each setting in order to maximize student achievement. There have been many studies focusing on techniques that use Technological Pedagogical Content Knowledge (TPACK) framework to integrate technology and enhance a specific learning approach (Archambault & Crippen, 2009; Harris, Mishra, & Koehler, 2009; Mishra & Koehler, 2006; Shulman, 1986). However, there has been little research observing the effectiveness of specific pedagogical strategies in a K-12 online school.

Assumptions Underlying the Study

Several assumptions underlie this study. First, the researcher assumes that the participants investigated are a representative sample of third grade students taking an online course from across the state. Second, it is assumed that the participants in the study would have performed similarly to third grade students in their district in the
previous year. Third, it is assumed that the variance in performance is due to the implementation of the new strategies.

General Research Hypothesis

Teachers in Ohio are responsible for the same amount of student growth and achievement and are evaluated using the same tools in both traditional and online courses. Teachers in online courses use the same learning outcomes and educational practices as in traditional schools (Baran, Correia and Thompson, 2011; Bryant, Kahle, and Schafer, 2005).

Several Ohio school districts, traditional and online, are using Marzano strategies in their Continuous Improvement Plans (CIP) to train teachers to use strategies that will promote student growth in an effort to reach Adequate Yearly Progress (AYP). The Marzano Causal Teacher Evaluation Model was created based on previous related works synthesized by McREL, Marzano, and MRL. The research done by McREL and then MRL was completed almost entirely within traditional schools (Marzano, 2011). There has been little to no research completed to investigate if these strategies are effective in an online environment. Currently, MRL has not posted any research evaluating the effectiveness of strategies in an online school.

Purpose of the Study

The purpose of this study is to focus on assessing the effectiveness of selected teaching strategies from the Marzano Causal Teacher Evaluation Model in online elementary courses. This is an attempt to assess if Marzano’s research based practices promote growth in student achievement in an online elementary school. In Domain 1 of the Marzano Causal Teacher Evaluation Model 41 elements are identified. MRL lists 22
of those strategies for action research projects. Among the 22 strategies, this action research project focuses on assessing the effectiveness of the following three strategies:

1. “tracking students’ progress” toward a learning goal through the use of scoring scales
2. “student discussion” in small differentiated learning groups
3. “feedback” from the teacher to students and parents in individual conferences with information on how well the student is doing regarding specific assignments.

These are selected strategies that MRL has identified for meta-analysis research and used in the Marzano Causal Teacher Evaluation Model.

Research Questions

In Domain 1 of the Marzano Causal Teacher Evaluation Model 41 elements are identified. MRL lists 22 of those strategies for action research projects. Three of the 22 strategies are tracking students’ progress, student discussion, and feedback. This study examined these three strategies in a third grade self-contained classroom at an online charter school. These strategies were selected because research suggests their implementation would increase student learning in an online environment, and they are able to be implemented into the pre-existing classroom.

To evaluate the effectiveness of these strategies in an online environment, this action research project inquires into the following two research questions:

1. Do the instructional strategies of tracking students’ progress, students’ discussion, and feedback described by Marzano Research Laboratory improve student achievement in a virtual classroom environment?
2. Are the instructional strategies from question 1 differentially effective across the subject areas of Math, Reading, Science, and Language Arts?

The first question is important because it will help to fill the gap in research of instructional strategies in online elementary schools. The second question is important because students may benefit from the strategies more in one subject area than another, regardless of the environment.

Significance of the Study

Current reform in education focuses on K-12 teachers becoming highly qualified through accountability and professional development. In the United States, individual states determine professional development standards for teachers. An understanding for effective professional development is emerging. It is crucial for professional development and curriculum to increase teacher effectiveness at every grade level in both face to face and online classrooms.

This action research project will fill a void in research regarding effective online teaching strategies in the K-12 online environment and provide a baseline for future research in this area. If the growth in student achievement is due to the implementation of the strategies of tracking student progress, student feedback, and student discussion, it will be critical to incorporate the effective strategies into the professional development of educators in K-12 online schools. Once it has been determined which strategies are significant in the online environment, the next step is to incorporate the TPACK model to enhance the delivery of the knowledge in this environment.

Definitions and Operational Terms
There are some differences between traditional and virtual classrooms. For the purpose of this study I define an online course as a course taught completely online. Courses that are taught face-to-face and courses that are taught in a blended mode of a physical environment and online methods are called traditional courses. An online teacher is defined as an instructor who teaches online; online teaching is teaching that is conducted in a virtual classroom (Baran, Correia, Thompson (2011).

I will use the following characteristics to define a virtual classroom: (1) It is delivered online- teachers and students are not in the same location as each other, (2) Time- live classes are archived to provide the potential for asynchronous lessons, thus providing more flexibility, and (3) Learning Mode-traditional teaching strategies are often altered to account for the distance between teacher and student. An example is a project may be sent to the instructor in the mail or a picture of a project may be submitted electronically instead of delivering it to the instructor personally.

Chapter Plan

In Chapter 1 an explanation of the basis of the study was given. In Chapter 2, I review the literature of teaching and learning in an online environment. Chapter 3 explains the research design and process for data collection. The results of the study are in chapter 4. Chapter 5 includes the conclusions of the study and a further exploration of implications of the study.
CHAPTER II
REVIEW OF THE LITERATURE

Introduction

The purpose of this study is to explore, evaluate, and validate the key role teachers play in the facilitation of learning by assessing the effectiveness of teaching strategies in an online setting. In this chapter, I first review the literature in online teaching and learning. Next, I review research literature relevant to the strategies of tracking student progress, student discussion/chunking, and feedback in traditional and online environments. Finally, I review the literature on assessment and use of diagnostic testing.

Online Teaching and Learning

In 2008, 44 states offered some form of virtual education to students. Twenty-one of those states had students studying in full-time virtual schools, usually charter schools (Glass, 2009). Teachers are being challenged to rethink their role as educators as the role of teachers and the nature of teaching are changing due to challenges in the online environment (Weisenberg & Stacey, 2008). Although educators around the world have become more involved in K-12 learning in online courses, there has been little change in online pedagogy. Most online teachers often feel unprepared for the challenges of online teaching. Consequently, they simply transfer traditional educational
practices into the online environment (Baran, Correia, Thompson (2011).

In their article about online teaching strategies, Brinthaupt, Fisher, Gardner, Raffo & Woodard (2011) wrote that many people felt that with multiple-choice tests that were programmed to be graded automatically and lectures that could be recorded and watched by one student or a thousand, online teaching was easier and took less time than in a traditional classroom. They mentioned that some people even felt that once posted, online classes could be put on “autopilot”. That type of thinking leads to much less effective teaching and learning (Brinthaupt, Fisher, Gardner, Raffo & Woodard (2011).

Equivalence Theory, discussed by Bryant, Kahle, and Schafer (2005), proposes that learning outcomes in distance education should be equivalent to those in traditional classroom settings. Babb, S., Stewart, C., & Johnson, R. (2010) argue that “Technology alone cannot create an effective learning community without the support of theory to fortify the course design.” Often, teachers are tempted to incorporate specific technology into a course without considering how the tool helps students learn (Clark-Ibanez & Scott, 2008; Fish & Wickersham, 2009; Hutchins, 2003).

Currently, there is very limited research evidence in the field of virtual K-12 schooling (DiPietro, Ferdig, Black, & Preston, 2008). Although literature that describes K-12 distance education starts in the 1930’s, online learning wasn’t included until 1997. Of the published literature that does exist, many are based on personal experiences. Most of the research that is available is from unpublished theses and dissertations (Barbour, Cavanaugh, & Clark 2009).
There has not been systematic research into the best practices of virtual K-12 school teaching strategies, particularly asynchronous teaching strategies (Hill, Wiley, Nelson & Han, 2004; Rice, 2006). Barbour, Cavanaugh, and Clark (2009) explain that based on their review of research in online teaching, the first area they identified a need for research is to establish best practices for online teaching strategies. In finding the effectiveness of selected strategies, this study could be a step toward identifying teaching strategies to be considered for establishment into online teaching.

Review of the Literature on Strategies

Tracking Student Progress

Traditionally, teachers gave an overall grade at the end of specific grading periods. In the 1970’s, a data-based approach was introduced to assess the growth of students in special education. Since then, substantial research literature has developed to demonstrate that curriculum-based learning goals can be used to gather student performance data in order to improve educational decision making (Busch, & Espin, 2003; Deno, & Mirkin, 1977; Deno, 1985; Shinn, 1995).

Tracking student progress and scoring scales involves the use of frequent data collection to monitor student progress toward a curriculum or standards-based learning goal according to a leveled scale. This can be accomplished in a traditional or in an online course through frequent scaled assessments. Designing multiple learning goals at different levels that are challenging, but attainable for students enables teachers to measure a student’s level of knowledge in a specific area. Research has shown that students become more aware of their own performance and learn more when their
progress monitored (Deno, 2003; Fuchs, Deno, & Mirkin, 1984; Good & Jefferson, 1998).

According to Robles and Braathen (2002), online courses require a more ongoing and systematic approach than what is typically used with traditional instruction. Tracking students’ performance in each area gives teachers a comprehensive view of the progress made by individual students. This is especially beneficial in an asynchronous learning environment.

For example, a single assessment in either environment may show a student is performing below the grade level expectation for the standard that is being assessed. In a traditional classroom you can monitor each student’s behavior during classes and observe changes in real time. Currently, we are unable to do this in an online classroom. Tracking student progress through frequent assessments can be used to show changes in student performance in an online classroom.

In an online course, a wide range of instructional decisions regarding a specific student or the entire class can be made with the information provided by tracking students’ progress. If a specific student typically performs above grade level and in the most recent assessment is tracking below grade level, the instructor might compare the results of that most recent assessment to the entire class. If the entire class did poorly on a single assessment, that standard might be re-taught and reassessed. If a specific student scored consistently below grade level, an instructor might use that information to discuss interventions with the student, parent, or special education team in their school.
Student Discussion/ Chunking

Chunking is any technique that breaks a large block of content into smaller, more manageable sections. Chunking reduces the cognitive load as the learner processes information from short-term memory to long-term memory (Gobet, Lane, Croker, et al. 2001; Miller, 1956). Student discussion/chunking involves breaking a lesson into chunks for student or group discussion regarding the content being considered before adding additional information.

Most social constructivist models stress the need for ‘scaffolding’ and collaboration among learners (Vygotsky 1978). Lecture should not be the primary teaching strategy in an online environment because it leads to learner isolation. Students should be active in the learning process through student-faculty contact and participants in class discussions (Conrad & Donaldson, 2004).

Research on learning communities within online learning environments for adults has been growing over the past decade (e.g., Alavi & Dufner, 2004; Berg, 1999; Carabajal, LaPointe, & Gunawardena, 2003; Dirkx & Smith, 2004; Fung, 2004; Hill, 2002; Hill, Raven, & Han, 2007; Kollok, 1998; McAlpine, 2000; Rovai, 2001; Stacey, 1999). However, there is a shortage of research exploring K-12 online learning communities (Barbour, Cavanaugh, & Clark 2009). When students do participate in online discussions, it still may not be as effective as a face-to-face interaction (Arbaugh, 2000).
Feedback

Feedback is information describing students’ performance in a given activity that is intended to guide their future performance in that same or in a related activity. Feedback often is informal, addresses specific actions, and its goal is learner improvement. Feedback is a necessary component to learning and helps learners in a variety of ways. Students who receive regular feedback about their performance perform significantly better than students who do not because they are more aware of the expectations set out for them (Hammond, 1971; Scheidt, Lazoritz, et al., 1986). Students with regular feedback also develop better judgment and learn faster than those who do not (Stillman, Sabers, & Redfield, 1976, 1977; Wigton, Kashinath, & Hoellerich, 1986).

Effective feedback is corrective (providing students with an explanation of what they are doing that is correct), specific (criterion-referenced to tell a student where they stand relative to a specific target of knowledge or skill rather than where they stand in relationship to other students), and feedback should be timely (Marzano, Pickering & Pollock, 2001). The timing of feedback is critical to its effectiveness (Marzano, Pickering & Pollock, 2001). It is even more important to make an effort to give effective feedback in an online course because it is easier to become disconnected in an asynchronous environment. One of the biggest complaints from students in online courses is lack of feedback (Ko & Rossen, 2001; Lynch, 2002; Palloff & Pratt, 2001).

Review of Literature on the Assessment Instruments

Goodwin, Englert, & Cicchinelli (2003) reviewed seven characteristics of effective accountability systems. Three of those seven are: high-quality assessments
aligned with standards, diagnostic uses for data and data that are readily understandable to the public.

Data from high-quality assessments aligned with standards are necessary because of the role assessments play in accountability systems. Assessments are a primary tool for measuring students, districts, and teachers (Buckendahl, Impara, & Plake, 2002). It is important for these assessments to be of high quality and aligned to academic standards (Baker et al., 2002). Using data in this way can help schools inform teachers and parents about student progress and status (Guth et al., 1999).

School improvement grant programs and Race to the Top have also emphasized the importance of using data and assessment to inform instruction. One of the key areas to the Race to the Top grant application is dedicated to “Data Systems to Support Instruction”. Once awarded Race to the Top Funds, states are required to use instructional improvement systems in their schools (Pilotin, 2010).

Instructional improvement systems are technology-based tools and strategies that provide educators with data to systematically manage continuous improvement through assessments and other activities. The systems are supposed to integrate instructional data in order to provide indicators of student performance and risk of educational failure (US Department of Education, 2010).

Performance Series through Scantron is an instructional improvement system that is an internet delivered and standards-based computer-adaptive assessment that uses quarterly diagnostic tests to measure the instructional level of each student and their
academic growth over time. The instrument in this study is Performance Series diagnostic
tests through Scantron. The Scantron company has been in education for over 30 years
and is proud that their tests are used in 80 of the largest 100 school districts in the United
States (Scantron, 2011).

Summary

In chapter two, a review of the literature in online learning informed the study by
presenting the area of need for research in effective strategies in K-12 online schools.
Next the literature of specific strategies of tracking student progress, student
discussion/chunking, and feedback in a traditional environment and in an online
environment reported potential for these strategies effectiveness in the online
environment. Finally, an examination of diagnostic testing was relevant because
diagnostic tests are the instrument in this study and will be discussed further in chapter
three.
CHAPTER III

METHODOLOGY

Introduction

In chapter three, I start by introducing Dr. Robert Marzano and presenting the previous research completed by the Marzano Research Laboratory relevant to this study. Next, I explain the hypothesis and design of the action research project along with a table describing the classroom behaviors relevant to this project. Chapter three also contains information about the participants and sampling procedure, along with a description of the diagnostic tests used as the instrument and the data collection procedure. Finally, I explain the statistical treatment and limitations of the study along with a final summary of the chapter.

Previous Research to Determine the Effectiveness of MRL

Dr. Robert Marzano has been with the Mid-continent Research for Education and Learning (McREL) for more than 20 years. With over 20 books and 150 articles, Marzano is known as one of America’s leading education researchers, developers, and authors. By analyzing and organizing McREL research from over 4 decades and 5,000 studies into categories of instructional strategies highly correlated with high levels of
student achievement along with suggestions for classroom practice and advice for instructional planning (Marzano, Pickering, and Pollock 2001). Marzano’s empirically derived theoretical framework was developed from a grounded theory perspective where data is collected through a variety of methods, then grouped into similar context leaving a reverse hypothesis that is “grounded” in the data form which it was developed as the basis for the theory (Allan, 2003).

Using action research, the Marzano Research Laboratory analyzes the effectiveness of instructional strategies identified through McREL studies in classrooms and schools across the nation. The Meta-Analytic Synthesis of Studies Conducted at Marzano Research Laboratory (MRL) on Instructional Strategies is a report that synthesizes 329 independent studies that involved 14,287 students between 2004 and 2009 that target instructional strategies that MRL has identified for meta-analysis research. It explains the extent to which the utilization of selected strategies enhances the learning of students. By representing many studies, they were able to determine the effect size of instructional techniques as a research base to identify the instructional strategies most likely to lead to improvements in student learning (Marzano Research Laboratory, 2009).

The instructional strategies identified by Marzano through meta-analysis in traditional courses that will be used in this study are: tracking student progress, student discussion/ chunking, and feedback (Marzano Research Laboratory, 2009). According to MRL’s Random Effects of Specific Instructional Strategies, the corrected percentile gains
for each of the strategies in traditional schools are: feedback 4%, student discussion 17%, and tracking student progress 34%.

Research Design

This study examines the impact of the utilization of selected instructional strategies on the learning of students. The progress of third grade students at an online school was monitored before and after the implementation of 3 of the strategies from Domain 1 of the Marzano Evaluation Model. This was measured by separate benchmark Scantron tests in the subject areas of Math, Reading, Language Arts, and Science. The students were measured in September 2011, December 2011 and March 2012.

In what follows, I present Table 1, Strategies Before and After December 2011, to describe the common practice prior to applying the selected strategies and the implementation of the selected strategies in the third grade classroom at an online charter school. The first column lists the strategy that is highlighted in each row. The second column describes how that strategy was addressed before December, 2011. The third column describes the efforts that were made to improve the effectiveness of each strategy after December, 2011.
Table 1:

*Strategies Before and After December 2011*

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<td>Students’</td>
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<td>Progress</td>
<td>• Grades on tests were out of 100% for the</td>
<td>• Assessments are graded based on scales from 0-4</td>
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<td></td>
<td>entire exam covering multiple standards.</td>
<td>toward separate standards-based learning goals.</td>
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<td>• No working grade book for students to</td>
<td>• 01/30/2012 – grade report mailed to families</td>
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<td></td>
<td>check their own grades.</td>
<td>• Creation of Standards-Based report card</td>
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<td>• Students are given frequent formative and</td>
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<td>summative assessments</td>
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</tr>
<tr>
<td>Students can send an email or text message to the teacher only.</td>
<td>Students / Parents can call teacher on the telephone. Students also have individual time with the teacher in “breakout rooms”.</td>
<td></td>
</tr>
<tr>
<td>Students are grouped based on diagnostic test scores and reading comprehension / fluency assessment.</td>
<td>Teacher lecture whole-group classes and archives</td>
<td></td>
</tr>
<tr>
<td>Students are able to message each other supportive comments in reading groups.</td>
<td>Students are given instructions in lesson plans and a due date.</td>
<td></td>
</tr>
<tr>
<td>Teacher opens the room for discussion with students sharing their responses to open-ended questions to the entire classroom.</td>
<td>Teacher uses agree/disagree voting tools and text messaging to check students’ responses in class and give instant feedback.</td>
<td></td>
</tr>
<tr>
<td>Text messaging is open before/after class for student friendship making as a reward on certain days.</td>
<td>Monthly “writing workshop” conferences for students to revise rough drafts and ask questions before submitting their final report.</td>
<td></td>
</tr>
</tbody>
</table>
Participants

The students are third graders at an online charter school. There are 80 students between the ages of 7 and 11 that participate in each testing session. The class is 48% boys (52% girls). The data from two consecutive tests is required to show the individual student growth. Due to transiency and truancy, 60% of the class participated in all three tests.

This class is very diverse with students that identify with different races, religions, and a wide range of socio-economic status and motivation for attending an online school. For example, some families enroll because they would like to keep their children closer to home and have more control of what their students are learning, while some other families enroll because their student has been disciplined in their local school district because of grades, behavior, and/or truancy. There are families that choose an online charter school because their child has been identified with special needs and staying home is easier for them. There are also families with healthy children, but a parent home on disability so it is difficult to leave the home.

To attend the school, they must all have a mailing address in the state of Ohio, but many of the students travel and are in different parts of the country and world. The classes take place in a live, virtual classroom with audio, video, and content display features. Students are also given daily lesson plans and assignments to complete outside of class.
The teacher of the class has a bachelor’s degree in elementary education (grades preK-3) is considered a “highly qualified” by the state. Like many online elementary school teachers her training was all within traditional classrooms. She did not envision herself teaching in an online school, but this has been the only school that she has been able to work for.

Sampling Procedure

This study uses a convenient sampling of students with repeated measures because the whole third grade class participated in all 3 testing sessions. They were all included in both the before strategies were introduced group and the group that received the strategies. Approximately 80 third grade students participated in this study, which is suitable for a medium effect size.

Instrument

Scantron provides separate diagnostic tests in the subject areas of Math, Language Arts, Reading, and Science. Scantron’s online assessment uses an innovative computer-adaptive model that adjusts to each student’s ability level during the test based on their previous answers (ex: if the student is answering correctly, the test generates more difficult questions and if the student is answering incorrectly, they are given questions that address lower level skills). This allows for an accurate evaluation of each student’s instructional level independent of their grade level.

After the testing is complete, Scantron sends the scaled score to the school district. Scaled scores are created by determining the level difficulty the student is most
able to answer questions correctly. A scaled score is the criterion-referenced interpretation of each student’s ability level in a subject area. The scale has more points on it than questions answered in the assessment.

In this study, the scaled scores of the students in each testing quarter were used to monitor student growth and achievement. The chart below shows third grade indicators Scantron derived using scaled scores from national norm research using student data from the 2005-2006 school year by subject area.

Table 2:

*Interquartile Range of National Scantron Scores During the 2005-2006 School Year*

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>2081-2292</td>
<td>2153-2369</td>
<td>2247-2463</td>
</tr>
<tr>
<td>Reading</td>
<td>2050-2516</td>
<td>2159-2608</td>
<td>2257-2678</td>
</tr>
<tr>
<td>Language Arts</td>
<td>2143-2409</td>
<td>2222-2495</td>
<td>2268-2521</td>
</tr>
<tr>
<td>Science</td>
<td>2117-2426</td>
<td>2265-2503</td>
<td>2266-2528</td>
</tr>
</tbody>
</table>

Data Collection

All third grade students took the Scantron test between (09/19-30/2011) and again between (12/05-16/2011) with only traditional teaching methods taking place from September to December. After (12/16/2011), the third grade teacher began to implement the 3 MRL teaching strategies until Scantron tests are taken again on (03/30/12). Scores
from the March Scantron tests were compared to the anticipated scores of not receiving MRL strategies for 3 months.

Statistical Treatment

In this study, the participants were given the traditional teaching methods during the first phase of the research and then in the second phase of the research the same students were then given the three instructional strategies of tracking student progress, student discussion/chunking, and feedback. A One-Way Repeated Measures ANOVA was used to estimate the treatment effect of the second phase of the research (Stevens, 2009). Repeated measures analysis of variance between groups (ANOVA) was used to test the equality of the means of the scaled scores of the same students under the different conditions of each time period in this research. The ANOVA design is based on the assumption of sphericity, which means using the same students in both conditions reduces some of the variance that might occur otherwise (Stevens, 2009; Field 2010; Cohen, Manion, & Morrison, 2011). Since the same students were measured three times, this was the most appropriate technique to assess the effect of the treatment. A bonferroni correction on planned comparisons was used to identify the specific changes in student Scantron scores. This technique corrects to the potential build up that results from multiple comparisons (Stevens, 2009; Field, 2010).

The difference in the growth rate of students is compared both to their own initial growth rate and their anticipated growth rate. The students’ initial growth rate is based on their actual growth from Time 1 to Time 2 without implementing any of the strategies. Their anticipated growth rate is based benchmark scores given by the Scantron test makers. They were determined by the national norm of same grade level students during
each testing period around the country. The students’ mean growth after the implementation of MRL strategies taken from Domain 1 of Marzano’s Causal Teacher Evaluation Model from Time 2 to Time 3 will be compared to their actual growth from Time 1 to Time 2 (before the new strategies) and the normal growth of students around the country during the same testing period (see Figure 2).

Figure 2. Predicted Treatment Differences

Limitations

This investigation uses Scantron scores from third grade students at an online charter school. Along with many advantages, there are many limitations. While there were approximately 80 students who participated in each round of testing, the district chosen has a high number of transient students and incidences of truancy, so the sample is limited to those students who were present during multiple rounds of testing. The sample also does not contain data from the students who were present during testing, but refused to participate.

Summary
In this chapter, the conceptual framework of the study was explained to examine the relevance of strategies that can be used by instructors in an online environment. A description of the teacher and students from the school district used in the study was also given along with the data collection procedure and limitations focusing on student truancy.
CHAPTER IV
RESULTS OF THE STUDY

Introduction

Chapter 4 presents the results of this research and is organized into three sections. The first section contains the descriptive statistics on the individual test across the subject areas of Language Arts, Reading, Math and Science. This includes the means, standard deviations and frequencies for each student as well as how they relate to the national average. The second section contains the primary analysis which answers the overarching research questions posed in this study. This chapter concludes with a third section that presents a summary of the findings. The findings of this study are presented in a text form as well as tables and graphs.

Results of Testing the Research Hypothesis

Section 1, descriptive statistics, was calculated so one could compare all Scantron tests across Fall, Winter and Spring testing periods. The average Scantron test score for Language Arts started in Fall with 2457.71 and actually had a decrease of about ten-points to 2447.17 for the Winter testing period. After implementing the three instructional strategies the test scores increased by about twenty points to 2466.31. In Reading the scores started with 2691.07 in the Fall and decreased over 100 points to 2581.98 in the
Winter. The scores recovered over 60 points after the implementation of the three instructional strategies back up to 2646. The Science scores also decreased from Test 1 to Test 2 and increased for Test 3 after the implementation of the three instructional strategies. The Science scores started at 2612.20, decreased over 70 points to 2540.79, and then increased about 40 points to 2581.31. The Math scores went from 2384.79 in the Fall to 2393.87 in the Winter. The increase in scores was greater from Test 2 to Test 3 (after the implementation of the three instructional strategies). The Math scores increased about 10 points from Test 1 to Test 2, but they increased over 30 points from Test 2 to Test 3 (See Table 3).

<table>
<thead>
<tr>
<th>Subject</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 LA</td>
<td>Test 1</td>
<td>SD</td>
<td>Test_2</td>
</tr>
<tr>
<td></td>
<td>2457.71</td>
<td>216.41</td>
<td>2447.17</td>
</tr>
<tr>
<td>2 Reading</td>
<td>2691.07</td>
<td>332.03</td>
<td>2581.98</td>
</tr>
<tr>
<td>3 Math</td>
<td>2384.79</td>
<td>206.47</td>
<td>2393.87</td>
</tr>
<tr>
<td>4 Science</td>
<td>2612.20</td>
<td>191.48</td>
<td>2540.79</td>
</tr>
</tbody>
</table>

Table 4 displays the average students’ mean scores from each subject area in each testing period are compared to the national expected scores for each testing period and subject area in this grade level. As shown by the data in the tables of the students in this study, the average students’ Scantron test score was higher than the national average regardless of the test period and subject.
Table 4

Comparison of National and Student Mean Scores by Subject Area

<table>
<thead>
<tr>
<th>Subject</th>
<th>Test 1 National</th>
<th>Test 1 Actual</th>
<th>Test 2 National</th>
<th>Test 2 Actual</th>
<th>Test 3 National</th>
<th>Test 3 Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>2283.00</td>
<td>2685.63</td>
<td>2383.50</td>
<td>2653.66</td>
<td>2467.50</td>
<td>2716.57</td>
</tr>
<tr>
<td>Math</td>
<td>2186.50</td>
<td>2396.60</td>
<td>2251.50</td>
<td>2396.79</td>
<td>2355.00</td>
<td>2444.77</td>
</tr>
<tr>
<td>L. Arts</td>
<td>2276.00</td>
<td>2454.95</td>
<td>2358.50</td>
<td>2469.46</td>
<td>2394.50</td>
<td>2498.03</td>
</tr>
<tr>
<td>Science</td>
<td>2271.50</td>
<td>2612.63</td>
<td>2384.00</td>
<td>2547.81</td>
<td>2397.00</td>
<td>2597.81</td>
</tr>
</tbody>
</table>

Note: all of the scores fall above the national normal scores reported by Scantron.

Figure 3 displays a set of graphs that show the average students’ Scantron scores for each subject across all testing periods compared to the national average scores. Both the national scores and the scores from this study showed growth from Test 1 to Test 3. The difference between the two groups is that the national scores have a linear growth pattern from Time 1 to Time 3, while the actual scores do not.

There was no growth in the actual data from Fall to Winter. This graphical representation helps to illustrate the trend of an initial decrease in test score from Test 1 to Test 2, followed by growth after the implementation of the three instructional strategies. This trend was consistent for every nearly every subject and most noticeable in math. This was not expected and may be related to the environment and should be noted. Again, these graphs reflect the previously mentioned finding that these students were higher than the national average across all tests and subjects (See Figure 3).
Repeated Measure Analysis

This section reviews the statistical results and presents the findings for the research hypotheses. The two general research hypotheses are reported individually.

General Research Hypothesis 1

The instructional strategies of tracking students’ progress, students’ discussion, and feedback described by Marzano Research Laboratory will improve student achievement in a virtual classroom environment.

To test this general hypothesis a One-way Repeated Measures ANOVA was utilized. This hypothesis was found to be statistically significant with significant changes.
in students’ achievement trends when comparing Scantron scores from before and after the implementation MRL strategies ($F_{2,334}=3.771$, $P=.032$). To investigate the precise differences a pairwise comparison was conducted with a bonferoni correction for multiple comparisons. This result indicated a non-significant decline from time Fall to Winter and a significant increase in test scores from Winter to Spring ($p=.732$ and $p=.001$ respectively) (See Table 5 and Figure 4).

Table 5

**Within Subjects Effects for Overall MRL Strategies**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>Greenhouse-Geisser</td>
<td>189021.00</td>
<td>1.63</td>
<td>115897.76</td>
<td>3.771</td>
<td>.032</td>
</tr>
<tr>
<td>Unexplained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>Greenhouse-Geisser</td>
<td>8371701.67</td>
<td>272.37</td>
<td>30737.06</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Greenhouse Geisser was used since the assumption of sphericity was violated.
Table 6

Pairwise Comparisons for the overall instructional strategies

<table>
<thead>
<tr>
<th>(I) Test</th>
<th>(J) Test</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>Cohen's D</th>
<th>95% CI for Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Winter</td>
<td>Fall</td>
<td>21.93</td>
<td>18.75</td>
<td>0.732</td>
<td>0.157</td>
<td>-23.43</td>
</tr>
<tr>
<td></td>
<td>Spring</td>
<td>-25.46</td>
<td>19.64</td>
<td>0.590</td>
<td>0.029</td>
<td>-72.95</td>
</tr>
<tr>
<td>Winter</td>
<td>Fall</td>
<td>-21.93</td>
<td>18.75</td>
<td>0.732</td>
<td>0.157</td>
<td>-67.28</td>
</tr>
<tr>
<td></td>
<td>Spring</td>
<td>-47.39</td>
<td>12.56</td>
<td>0.001</td>
<td>0.128</td>
<td>-77.77</td>
</tr>
<tr>
<td>Spring</td>
<td>Fall</td>
<td>25.46</td>
<td>19.64</td>
<td>0.590</td>
<td>0.029</td>
<td>-22.03</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>47.39</td>
<td>12.56</td>
<td>0.001</td>
<td>0.128</td>
<td>17.01</td>
</tr>
</tbody>
</table>

Note: All Cohen’s D effect sizes were small.

Figure 4. Mean score changes before and after Strategies
Using the mean scores of all students from Tests 1 and 2, an anticipated score for Test 3 was calculated. The anticipated mean score for Test 3 was determined by using the slope from Test 1 to Test 2 and continuing the line to the Test 3 point to show where the line could have fallen had the trend continued. In the following graph, the anticipated mean score for Test 3 is shown in comparison to the actual mean score for Test 3 along with the actual scores from Test 1 and Test 2.

The following tables and figures indicate differences between what the students’ predicted trend score would have been if they maintained the same trajectory with their Spring test score. As shown in Table 7 and Figures 5 & 6, there is a difference of 69.322 between the predicted and actual test score after implementing the learning strategies.

Table 7.

*Comparison of Test Scores Across Subject Areas*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean Test 1</th>
<th>Mean Test 2</th>
<th>Mean Growth</th>
<th>Anticipated Test 3</th>
<th>Mean of Actual Test 3</th>
<th>Difference between actual and anticipated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined subject areas</td>
<td>2531.387</td>
<td>2509.458</td>
<td>-21.929</td>
<td>2487.529</td>
<td>2556.851</td>
<td>69.322</td>
</tr>
</tbody>
</table>
This data can be broken down to show the differences in anticipated growth vs. actual growth in each separate subject area.

Table 8.

Comparison of Test Scores in Individual Subject Areas

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean Test 1</th>
<th>Mean Test 2</th>
<th>Mean Growth</th>
<th>Anticipated Test 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>2685.629</td>
<td>2653.657</td>
<td>-31.972</td>
<td>2621.685</td>
</tr>
<tr>
<td>Math</td>
<td>2396.604</td>
<td>2396.792</td>
<td>0.188</td>
<td>2396.980</td>
</tr>
<tr>
<td>Language Arts</td>
<td>2454.946</td>
<td>2469.459</td>
<td>14.513</td>
<td>2483.972</td>
</tr>
<tr>
<td>Science</td>
<td>2612.625</td>
<td>2547.812</td>
<td>-64.813</td>
<td>2482.999</td>
</tr>
</tbody>
</table>
Table 9.

Comparison of Anticipated and Actual Scores for Test 3

<table>
<thead>
<tr>
<th>Subject</th>
<th>Anticipated Test 3</th>
<th>Mean of Actual Test 3</th>
<th>Difference between actual and anticipated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>2621.685</td>
<td>2716.571</td>
<td>94.886</td>
</tr>
<tr>
<td>Math</td>
<td>2396.980</td>
<td>2444.771</td>
<td>47.791</td>
</tr>
<tr>
<td>Language Arts</td>
<td>2483.972</td>
<td>2498.027</td>
<td>14.055</td>
</tr>
<tr>
<td>Science</td>
<td>2482.999</td>
<td>2597.812</td>
<td>114.813</td>
</tr>
</tbody>
</table>
Figure 6. Comparison of Scores in Individual Subject Areas

General Research Hypothesis 2
The instructional strategies from question 1 are differentially effective across the subject areas of Math, Reading, Science, and Language Arts.

This hypothesis was tested utilizing a Between Factors Repeated Measures ANOVA. This hypothesis was found not to be statistically significant with no differential effect of MRL strategies across subjects on in students’ achievement trends ($F_{6,328} = .664$, $P = .648$). Since there was not significant interaction between test time and subject no comparisons are required. It should be noted that there were differences between subjects, but it was not significant across test times (See figure 7).

Table 10

*Interaction Between Subject Areas Repeated Measures ANOVA*

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>Greenhouse-Geisser</td>
<td>185620.29</td>
<td>1.63</td>
<td>113536.75</td>
<td>3.680</td>
<td>.035</td>
</tr>
<tr>
<td>Test *</td>
<td>Greenhouse-Geisser</td>
<td>100481.58</td>
<td>4.90</td>
<td>20486.90</td>
<td>.664</td>
<td>.648</td>
</tr>
<tr>
<td>Subject</td>
<td>Greenhouse-Geisser</td>
<td>8271220.09</td>
<td>268.12</td>
<td>30848.69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

41
Summary

This chapter started by displaying the descriptive results of this research. The trend that emerged was that student Scantron scores initially decreased from Fall to Winter. Then there was positive growth between Winter and Spring. This trend was consistent across nearly all subject areas. The descriptive statistics also illustrated that these students started and stayed above the national average reported by Scantron.

The second section utilized a One-Way Repeated Measures ANOVA to statistically test the effectiveness of the instructional strategies on Scantron test scores.
This test indicated that Marzano’s instructional strategies of tracking student progress, student discussion, and feedback had a significant positive result on students’ scores. The second test indicated that there were no significant differences between subject areas. Even though Language Arts did not fit the same trends as the other subject areas, the trend test scores were not different enough to meet the level of significance of alpha <0.05.
CHAPTER V
SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter provides a brief summary restating the problem and purpose of the study, an overview of the methodology and hypothesis, conclusions and discussion of the findings of the two research questions followed by implications, limitations, and concludes with recommendations for further research.

Summary of the Study

Distance education through online schools is becoming more popular in all levels of education. Current practice in most K-12 online schools is to use the same teacher evaluation models and professional development as schools in the traditional setting. This is due to a lack of research to show if this approach is appropriate.

Most of the research in online classes has taken place in/for higher education. Although there is a difference in the attitudes, behaviors, and expectations of college students and elementary students, there has been very little research in/for online elementary schools. When seeking educational strategies for their class, online elementary school teachers often must decide if they will use research-based strategies
recommended for their environment, but not for their grade level, or research-based strategies recommended for their grade level, but not their environment.

Methodology

In this study, the three strategies of tracking student progress, student discussion/chunking, and feedback were selected from the Marzano Causal Teacher Evaluation Model for research in a third grade classroom at an online charter school. In this action research project, the same group of students was tested in the fall, winter, and spring of the same school year. From fall to winter was the control where the students received only traditional strategies. From winter to spring the teacher implemented the new strategies. One-Way Repeated Measures ANOVA was used to measure how the students performed during the different testing periods and across different subject areas.

Research Questions

To evaluate the effectiveness of strategies in an online environment, this study inquires into the following two research questions:

1. Do the instructional strategies of tracking students’ progress, students’ discussion, and feedback described by Marzano Research Laboratory improve student achievement in a virtual classroom environment compared to the predicted trends resulting from traditional instructional methods?

2. Are the instructional strategies from question 1 differentially effective across the subject areas of Math, Reading, Science, and Language Arts?
Results

Research Question 1

According to the results, there were statistically significant changes in students’ achievement trends when comparing Scantron scores from before and after the implementation MRL strategies ($F_{2,334}=3.771$, $P=.032$). There was a non-significant decline from time fall to winter during the control period, and a significant increase in test scores from Winter to Spring ($p=.732$ and $p=.001$ respectively) when the strategies of tracking student progress, student discussion/chunking, and feedback were implemented. The improved student achievement during the time the strategies were implemented shows the strategies were as effective as they were predicted they would be.

These findings support much of the previous literature on these learning strategies. This was an important step because very little research has been conducted in online elementary schools and the previous research mainly pertained to traditional schools.

Research Question 2

There was not a statistically significant differential effect of MRL strategies across subjects on in students’ achievement trends ($F_{6,328}=6.64$, $P=.648$). Although there were differences between subjects, it was not significant across test times. There was very little research that focused on the differential effects of the strategies across subject or content areas. This finding seems to indicate that the strategies are good across content areas even though there was non-significantly less of an impact on Language Arts.
Discussion

Student achievement was increased in every subject area during the time period the instructor used the strategies of tracking student progress, student discussion/chunking, and feedback. These results suggest the effectiveness of these strategies in increasing student achievement in the online environment. The next step in research is to use the TPACK framework to examine the different ways these strategies can be accomplished in a completely online environment. This is an important step in distinguishing the needs of traditional, blended, and online courses because while a single course in all three environments may use the same strategy, they may prefer different technologies to accomplish their instructional goal.

Implications

These results seem to indicate that there is a significant positive result between instructional strategies identified by Marzano and achievement across all content areas. Therefore, it is this researcher’s suggestion that some of the funds appropriated for professional development in school districts should go to training and implementation of these strategies. From a state or university point of view, I further suggest examining the current practices in K-12 online school districts in an effort to identify trends within this new and changing environment. Lastly and more importantly, before any major policy changes take place in the school, district, pre-service education, and state levels more extensive research needs to be conducted on these potentially promising strategies.
Suggested Further Research

This study has presented several opportunities for further research. It is recommended that research should occur in some of the following areas:

- Teacher evaluation models appropriate for use in K-12 online schools

This study focused on the notion that currently, teachers in online schools are evaluated using the same models as teachers in traditional schools, even though there are obvious differences in environment. On the new teacher evaluation currently being piloted in both traditional and online schools in Ohio, the section on Classroom Environment found on Standard 1: Students; Standard 5: Learning Environment focuses on setting up an environment and routines that ensure the safety of students, even though in an online school the teacher may not ever be in the same place as the student and is not involved in this process the same way a teacher in a traditional school would be.

The source of evidence required to measure this is a formal observation, but another area of concern is how the teachers will be observed. In a traditional environment, the observer will typically interview the teacher about their planning process and observe the teacher and the students’ reaction to the teacher in the classroom. In the online environment, the teacher view and student view of a live class are not the same. The observer could watch the student view and only witness what the students are able to experience. This would not show what the teacher is actually doing, only the result. The observer could also be in the same location as the teacher and watch the teacher’s actions during the live class presentation. I believe that both types of observation are different
and would be valuable and a decision needs to be made in this matter in order to maintain consistency in observations.

- Certification of cyber-teachers and administration of schools with online courses

Teaching in a completely online environment requires different equipment than a traditional environment. Despite the difference, most certified teachers have been trained primarily for traditional schools. Currently, any teacher certified in the traditional environment is also certified in an online environment. There is no required training for already certified teachers to prepare them for teaching an online course. Changing the certification process to require teachers to be certified cyber-teachers to work in an online school may also increase the effectiveness of teaching in this environment because it will distinguish teachers who wanted to teach an online course from the teachers who ended up teaching an online course.

- Professional development K-12 online educators

The change in certification will also require a change in professional development. The professional development of online teachers will need to include strategies that have been proven to be effective in an online environment. Strategies should be researched by measuring their impact in blended and completely online courses in the different grade levels.

- Teaching strategies and appropriate class size/ case load in online schools specifically for early childhood, middle-childhood and high school courses

In the traditional K-12 environment, there is typically an article written into the teacher’s contract specifically defining pupil-teacher ratio. In traditional schools,
class size was initially determined by the physical size of the room the class was held in. Online courses occur without a physical location and many schools use that as an opportunity to increase class size, even though virtually every study on class size in the past 20 years shows that student performance increases when teacher-student ratio decreases.

Teacher ratio is often defined at around 40 classroom teachers per 1000 students (approximately 25 students/teacher) in a traditional school district. In K-12 online schools, it is not uncommon for the student-teacher ratio to be closer to 100-1. Drawing from this study, it is my opinion that a single teacher could not effectively manage that many students, even in an online class. Therefore, I recommend that limits on class sizes in K-12 online courses should be defined, and schools that do not adhere to the guidelines on appropriate class size would forfeit their eligibility for state and federal funding.

Currently, most states require different teacher licensure requirements for early childhood, middle-childhood, and high school courses under the belief that the students in these different stages have different needs. It is my recommendation that research on the specific needs of online students in these different stages is necessary for determining how many students it is appropriate for a single teacher to manage on their caseload at a time. This is related to my next recommendation.

- Parent involvement of online elementary students

This study focused on the importance of interaction between students and their learning. The results of this study were affected by the amount of students who did
not complete all of the tests. Students are not able to interact, if they aren’t even present.

The popular belief in higher education is that online learning is appropriate for students that are highly motivated and self-directed. In K-12 schools parents choose the environment, not just the student. Older students may be more responsible and self-directed, but this is a learned behavior that may not be attained in the earlier grades.

In most states, children under a certain age are not legally allowed to be home without adult supervision and guidance. It is my recommendation that when an adult decides to have their child attend an online school, it becomes their responsibility to ensure they are attending the online classes and completing their assignments. This may require more involvement from parents of younger students and is also related to the next recommendation.

- Adaptation of truancy policy for K-12 students enrolled in online courses

As mentioned previously, this study was affected by students that did not participate in assignments. School attendance is mandatory for most students. Truancy is the intentional unauthorized absence from compulsory schooling. In most public and charter schools, a handbook defines the legitimacy and amount of “absences” that are allowable during a school year. When a student attends class, they are considered “present”.

In an online environment, much of the learning is asynchronous so it is common for not all of the students to attend every live class session. Some subjects may not
even offer live class options, depending on the school. Online charter schools still receive public funding and are usually bound by the same expectations as public schools. It is difficult to determine a truant online student using traditional methods of determining “absence” and “presence”.

It is my recommendation to redefine those terms so they are able to be specifically applied to online schools in order to determine and distinguish appropriate student participation. This may include parent participation or tutoring requirements for students in certain grade levels or students with special needs. Parents of truant students in an online school should be reprimanded similarly to the parents of truant students in traditional school districts.

There are several opportunities for building on the current research. While the recommendations listed above are not totally comprehensive, they are a result of issues that emerged during this study on tracking student progress, student discussion, and feedback in a third grade class at an online charter school. Any additional information in K-12 online education would be of benefit to online educators and administrators and will help to fill the current void in research.

Summary

This study examined the effectiveness of the strategies of tracking student progress, student discussion/chunking, and feedback in a K-12 online environment. This action research project is a small step toward identifying research-based best practices in an online elementary classroom. This study is most significant in that it provides baseline data and useful background information for future studies. It also forms awareness for
some of the elements like class size and truancy that might be taken for granted in the traditional setting and are missing or may be ignored in some online school districts. This study is one that can begin to fill a void in research that, once filled, can be used to develop policies specifically aligned to meet the needs of online elementary schools.
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March 14, 2012
Rene Bemel
379 Mowbray Road
Akron, Ohio 44333

From: Sharon McWhorter, IRB Administrator

Re: IRB Number 2012 0319 “A Study of the Effectiveness of Selected Instructional Strategies from the Marzano Special Teacher Evaluative Model in a Third Grade Classroom at an Online Charter School”

Thank you for submitting your Exemption Request for the referenced study. Your request was approved on March 14, 2012. The protocol represents minimal risk to subjects and matches the following federal category for exemption:

☐ Exemption 1 – Research conducted in established or commonly accepted educational settings, involving normal educational practices.

☐ Exemption 2 – Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.

☐ Exemption 3 – Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under category 2, but subjects are elected or appointed public officials or candidates for public office.

☐ Exemption 4 – Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.

☐ Exemption 5 – Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine public programs or benefits.

☐ Exemption 6 – Taste and food quality evaluation and consumer acceptance studies.

Annual continuation applications are not required for exempt projects. If you make changes to the study’s design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact me to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. This office will hold your exemption application for a period of three years from the approval date. If you wish to continue this protocol beyond this period, you will need to submit another Exemption Request. If the research is being conducted for a master’s thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

Cc: Huey Li - Advisor
Cc: Stephanie Woods – IRB Chair

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☑ Approved consent form/s enclosed