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Integration of Reading and Mathematics in Business Courses

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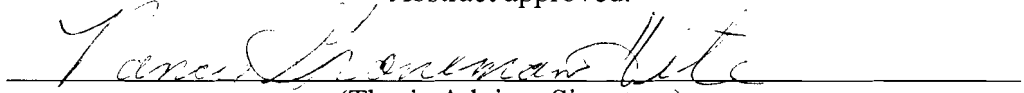

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Abstract

This study dealt with the integration of mathematics and reading in secondary school business courses. The main purposes were to determine (1) the type and amount of preparation secondary education business teachers have to teach reading and math skills, (2) the extent of reading and math integration in business courses, and (3) the individual(s) responsible for teaching reading and math at the secondary level. The population included a sample of secondary school business teachers in Kansas and university business teacher educators from across the U.S.

Both secondary business teachers and university business teacher educators agree that is it quite important to teach reading and math skills in business courses. The majority of secondary business teachers and business teacher educators believe they are adequately prepared to teach reading. Over 50 percent of the business teachers and 90 percent of business teacher educators believe integrating math and reading skills in business courses is very important. Over 50 percent of secondary business teachers integrate reading and math at least once a week. However, secondary business teachers integrate math instruction less frequently than reading instruction. Reading skills are integrated more often on a daily basis than math skills. Methods used most frequently by secondary business teachers to teach reading were summarizing (26%) and note taking (26 %). Math skills taught most frequently by secondary business teachers were addition, subtraction, multiplication, and division. About 48 percent of secondary business teachers were taught to integrate reading and math after receiving their teaching certificate/license through in-service training even though the majority of university business education programs currently teach integrated reading methods in professional education courses (66 %) and teach math skills (59 %) within business education programs. Secondary business teachers and university business teacher educators believe that teaching reading and math is the joint responsibility of all teachers including English and math teachers, all academic teachers, and career/technical education teachers.

# INTEGRATION OF READING AND MATHEMATICS IN BUSINESS COURSES

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A Thesis

Presented to

The Department of Business Administration and Education

EMPORIA STATE UNIVERSITY

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In Partial Fulfillment

Of the Requirements for the Degree

Master of Science in Business Education

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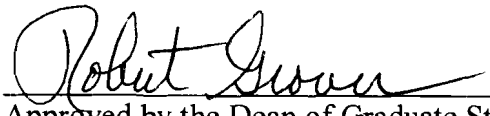
by

Frederick William Polkinghorne

May 2006

Approved by the Department Chair



Approved by the Dean of Graduate Studies
and Research

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In special recognition, Dr. Zinna L. Bland, PhD, from Central Missouri State University provided countless hours of support, criticism, and empathy during my undergraduate preparation and during my current educational career.

Dr. Nancy Groneman Hite and Dr. Barbara Railsback have provided the support and knowledge in assisting me not only in the creation and completion of this thesis but the criticism needed to exceed expectations and delve into the needs and current research associated with the field of business education.

On a final acknowledgement, I dedicate this thesis to the memory of Joyce M. Currie, my high school librarian at Winfield R-IV Schools (Winfield, MO). I thank Joyce for tossing a Peterson's Guide to Four-Year Colleges into my lap as a high school sophomore and asking a quite perplexing question at the time, "Fred, What Are You Going To Do With Your Life?"

# PREFACE

Over the last few years, greater emphasis has been placed on testing secondary school students over academic subjects with dire consequences if schools do not meet preset minimum test scores. To raise test scores of students in some schools at least, all secondary education teachers are being asked to teach basic academic skills. As more high school business teachers are being required to integrate academic subjects within the business courses they teach, the question arises, "Are they really prepared to integrate basic skills in the business courses they teach?" This study was undertaken to determine the perception of secondary level business teachers' preparation to integrate mathematics and reading in business courses and the preparedness of university business teacher educators to teach their pre-service business education students how to integrate methods of teaching math and reading in high school business courses. In addition, both groups were surveyed to determine their perception of whose responsibility it is to teach reading and mathematics in secondary schools.

TABLE OF CONTENTS

LIST OF TABLES/FIGURES

## Introduction

Educators and non-educators appear to believe that a substantial number of high school students do not have the reading and math skills they need to learn and be successful in high school business courses. Sometimes secondary school teachers blame teachers in the lower grades for not preparing students with adequate reading and math skills; however, blaming teachers at lower grade levels does not solve the problem for high school students who lack adequate reading and math skills. One approach, espoused by Dupuis and Merchant (1993), Norwich Free Academy (1991), and Meyer (1991), is to integrate reading and math instruction in business courses. However, this approach requires that business teachers have the ability and desire to teach reading and math skills in their courses. With the emphasis on testing students on basic skills such as reading and math at all grade levels, academic teachers as well as career and technical education teachers are being pressured to emphasize basic skills in their courses.

## Problem Statement

The purpose of this study is to determine the type and amount of preparation secondary education business teachers have to teach reading and math skills, to determine the scope of reading and math integration in business courses, and to determine the importance of reading and mathematics instruction at various grade levels.

The specific research questions this study is designed to answer are as follows:

1. Do business teachers have adequate preparation to teach reading and math skills?
2. Do business teachers believe it is important to teach reading and math skills in business courses?
3. Whose responsibility is it to teach reading and math skills?

4. How frequently do business teachers integrate reading and math instruction in their business courses?
5. What instructional methodologies do business teachers use to teach reading and math?
6. When do pre-service and in-service business teacher education students receive instruction on how to integrate reading and math in business courses?

## Review of Literature

Business education has long been associated with bridging the gap between academics and the workplace. Federal and state legislation has taken aim at increasing student achievement in three distinct areas: reading, writing, and mathematics. Educators and non-educators alike have, for many years, witnessed a decrease in student preparation in mathematics and reading. More than 20 years ago, employers indicated that high school students were weak in the areas of math and reading (Smith, 1979).

Recently, the U.S. Department of Education reported only eight percent of sophomores were able to demonstrate an ability to make complex inferences or evaluative judgments in reading (Ingels, Burns, Chen, Cataldi, and Charleston, 2005). Reading is not the only area struggling in the American education system. A mere 20 percent of high school sophomores understand intermediate-level concepts in mathematics (US Dept. of Education, 2002).

The Nation's Report Card ™ shows all states reporting a decline in the number of students scoring in the advanced category in reading proficiency and an increase in the number of students scoring in the basic category in reading proficiency in the eighth

grade as compared to the achievement of fourth graders (Perie, Grigg and Donahue, 2005). The same report showed 67 percent of states reporting a decline between the fourth and the eighth grades in the number of students scoring at or above basic in mathematics.

Usually, basic skills include communications, math, and reading. Carrithers (1986) research identified the top two skills needed by high school students to be as follows: (1) communication skills including reading, writing, listening, and speaking and (2) fundamental skills in math and science in the year 2000. More recently, the United States Department of Education stated in the Getting America's Student Ready for the 21st Century report (1996) that along with reading, writing, and arithmetic, technology has become part of the nations new basics. Without high-quality and well-trained teachers, computers alone cannot meet the challenges of this new century to integrate the new basics to equip America's children with the skills needed to meet the demands of the American workforce.

## Reading

Literacy is defined as the ability to read phonetically and for comprehension, write, speak, and understand both oral and written communication to identify what students know and want to know (Meltzer, 2002). Literacy is critical to teaching and learning. Many high school students do not know how to read for comprehension (Forget and Bottoms, 2000). At the high school level, support for the development of literacy skills is crucial to the long-term and short-term successes of students (Meltzer, 2002). Meltzer (2002) contends that all high school teachers must be involved in literacy preparation because of the following: (1) the lack of reading specialists at the high school

level (2) the increased literacy needs of high school students enrolled in content courses and (3) the increasing number of English as a second language learners in the high school.

All teachers need to know that they can teach subject-matter content while at the same time improving students' reading and comprehension skills. Heffren (1999) found only 30 percent of students read for pleasure in the senior high school years. However, teachers can ensure success by using reading to engage students in higher-level thinking (Forget and Bottoms, 2000).

A high level of literacy is essential to the continued success of American society; low-level reading skills hold back many of American students, making it difficult for them to understand their coursework (Morris, 1998). Taylor (2004) suggests stakeholders – including scholars, teachers, administrators, and students – do not fully understand the importance of reading at the high school level. In addition, Taylor's research suggests that reading skills have not been adequately taught in the high school. However, many educators' believe high school students know how to read well enough to learn new content even though high school students have not had instruction in reading since the elementary grades (Forget and Bottoms, 2000).

Taylor (2004) reports there are methods of teaching reading that can, at the same time, teach content-area skills in an applied context. Some educators believe that all instructors, including business teachers, should address the development of writing, listening, speaking, reading, and nonverbal skills (Norwich Free Academy, 1991). Moreover, Meyer's (1991) recommended that integrated vocational and academic courses

should be expanded and developed to provide high school students with the opportunity to learn academic skills in an alternative, applied context.

Teaching academic skills should be the joint and shared responsibility of both general and vocational education teachers (Quinn, 1988). Manzo (2001) contends that most schools and teachers understand that they are not merely responsible for teaching a subject but for teaching all students to be lifelong learners. He believes it is this shift in perspective that has created a new awareness of the importance of reading skills in the high school. In fact, Schiering (1989) discovered that eleventh-grade students enrolled in English classes who were treated to vocational education had higher reading comprehension achievement than those who were not enrolled in vocational education courses.

Literacy is not owned by any specific department and it is wrongly assumed the English department teaches literacy (Meltzer, 2002). The same report indicated most English teachers do not have any more training in teaching literacy than their colleagues (Meltzer, 2002). In fact, Jorgensen (2000) found 68.6 percent of high school teachers rate their own preparation to teach reading as fair or poor. Secondary school educators know that literacy is a priority, but they are often at a loss as to how to address it systematically within their school or district (Meltzer, 2002).

Few middle and high school teachers see their own ability to read subject area textbooks as a powerful resource for helping students approach textbooks in content areas independently, confidently and successfully (Schoenback and Greenleaf, 2000). Teachers must educate students to be good readers with problem solving skills as these are required in American society today (Ediger, 2000).

Empowering business educators with strategies to address reading in the content-area allows teachers to work with students who have low-level reading abilities (Vaddhanayana, 1998). Traditionally, vocational educators have needed to keep up to date in the fields in which they prepare their students. To do so, vocational educators continue to participate in a variety of professional development opportunities related to their content area (Wonacott, 2001). Unfortunately, many teachers feel pressure to cover their curricular content and manage to teach their content without emphasizing high-level reading skills (Schoenback and Greenleaf, 2000).

## Mathematics

In addition to poor reading skills, various reports (Carrithers, 1986; Perie & Dion 2005) indicate that high school students also have poor mathematical skills. The National Assessment of Education Progress reports only 37 percent of 12th grade students performed at a basic level on the math portions of standardized tests (Stone, Alfeld, Pearson, Lewis & Jensen, 2005). Reed (1995) found that mathematical connections could relate mathematical topics to students' daily lives and content areas. The same report found these connections help students understand mathematics better and see it as a useful and interesting subject to study. Unfortunately, research indicates fewer than 5 to 13 percent of vocational teachers coordinate efforts with math teachers (Heaviside, Carey, Farris, Westat, Carpenter, 1994). The intent is not to make math teachers out of career and technical education teachers; however, vocational teachers must be able to teach students to understand the math within the career and technical education content.

The National Research Council blames high school students' low-level math skills on vocational education courses that are not integrated with mathematics, and low

achieving students' belief that vocational education classes are not as rigorous as traditional high school courses. However Tindall, Gugerty, Phelps, Weis & Dhuey (1996) contend that integrated vocational/academic education will help to make academic education essential for students.

Career and technical education can bring academic disciplines into reality for the high school student. Wiltshire's (1997) research indicates that students who are in courses that integrate academic and technical content perform significantly better on standardized tests. That study showed the most effective approach to teach mathematics is an integrated curriculum. Another study (Simpson, 2002) found an integrated approach in teaching vocation courses with mathematics were successful in preparing students with employability skills.

The need for integration of academic skills and career and technical education has become clear to the academic community and is encouraged through increased funding (Roche & Cummings, 1993). Jordan (1985) showed that curricula can be organized so two skills - mathematics and computers can be taught together efficiently. Clearly, a program that integrates academics and vocational education are an ideal environment for helping students to achieve higher levels of competency in math (Roche and Cummings, 1993). Math skills are abundant in the career and technical education curricula, but those skills are hidden to both teachers and students (Stone, Alfeld, Pearson, Lewis & Jensen, 2005).

Bottoms and Presson (1995) found 33 percent of students said they applied mathematical knowledge learned in the classroom to real-life situations (Bottoms and Presson, 1995). Sponer (1995) believes educated people should be able to connect

learned content to new situations and students should be encouraged to appreciate the overlap among curricular areas.

Career and technical education allows for a more understandable method of teaching mathematics. The concept of an understandable mathematical program dates back to the era of John Dewey who argued students must be able to utilize the skills from the classroom in the workforce; the content taught in schools must be able to be used in real-life or the isolation prevents students from connecting the content to everyday activities (Stone, 2003). Heaviside, Carey, Farris, Westat, Carpenter (1994) found that vocational teachers report only three percent of class time is spent on mathematics beyond basic algebra problems. The same study found 58 percent of vocational teachers report no class time is being devoted to using basic algebra.

One reason for the lack of math integration in vocational education courses is the feeling of inadequate math preparation by vocational teachers. Only 19 percent of vocational teachers report they felt prepared to teach mathematics (Heaviside, Carey, Farris, Westat, Carpenter, 1994).

Both employers and college professors are concerned with students' lack of math skills. In fact, 63 percent of employers and 65 percent of college professors indicate high school graduates are lacking skills in mathematics (Johnson, Duffett, Vine, and Moyne, 2003). A mere 40 percent of American high school graduates meet college readiness assessments in algebra (Plucker, Zapf and Spadlin, 2004). However, additional research on the creation of opportunities for students to use mathematical knowledge in real-life situations is needed (Bottoms and Presson, 1995).

## Integration of Basic Skills in Career and Technical Education

The structural obstacles to crossing interdisciplinary boundaries and integrating basic skills across the curriculum are real (Gilbert, Schilt, and Ekland Olson, 2005). Besides problems crossing disciplines within schools, secondary school curriculums are scrutinized by the community, parents, teachers, and even students and have to offer interesting courses that motivate students (Witte, 2004).

The challenge for career and technical education, according to Kazis (2005), is to maintain program integrity and improve instruction in a situation that demands academic progress. Career and technical education (CTE) has the ability to engage students who might be turned off by traditional academic work, assisting schools in meeting the current legislation through integrated studies in vocational education (Kazis, 2005). Since career and technical education teachers are not trained to teach math, explicit math content such as algebraic formulas rarely makes it onto the blackboard (Stone, Alfeld, Pearson, Lewis & Jensen, 2005).

## Workplace Skills

Business leaders have criticized the American education system for producing graduates deficient in the basic academic skills of reading and mathematics (Santaniello, 1990.) As a result of declining math and reading skills, an increasing number of employers are assessing foundational skills, primarily in reading and mathematics, prior to hiring employees (Saterfield & McLarty, 1995).

A lack of preparedness and deficiencies in basic academic skills of high school graduates make the transition from school to the workplace difficult (Quinn, 1988). Many employers have been unable to find the kind of employees they need. When they express

dissatisfaction with job applicants, it is not on the basis of their technical skills but rather because of their competencies in other areas (Alpern, 1997; Murnane and Levy, 1996). Thus, it is not students' ability to master competency skills – rather it is students' ability to embark on the path of lifelong learning.

Educators believe that students are being prepared for employment; however, potential employers remain dissatisfied (Aulbach, 1994). Frequently, employers are dissatisfied with students' skill in reading, writing, and computation (Imel, 1999). Research supports the need to develop literacy skills to meet the demands of the workplace (Balderas, 1998).

For decades, business educators have been instilling employability skills in their students. In the past, those skills were primarily task-oriented. Students were taught skills such as bookkeeping and keyboarding, skills that could be used on-the-job after graduation. Historically, the business education curriculums in high schools have focused on such task-oriented skills. Dupuis and Merchant (1993) contend the literacy skills associated with keyboarding and the thought process involved in composition are just as important as the keyboarding skill.

As early as the 1980s, workplace literacy was catapulted to national prominence by the perception that as a nation the United States was losing its competitive edge (Kerka, 1999). More recently, Dupuis and Merchant (1993) stated workplace literacy is one of the most pressing issues in education today; they believe equipping students with the skills needed to read business materials is the responsibility of business educators. In *An Assessment of American Education* (1991), employers said only 12 percent of today's high school graduates can write well and only 33 percent can read and understand written

and verbal instructions (Louis, Harris & Associates, 1991). Astonishingly, that research indicates that nearly nine out of ten students write poorly and seven out of ten students cannot comprehend the information they read. This situation is unlikely to change unless high schools use reading and writing as a way to advance learning in all subjects (Bottoms, 1995).

While reading comprehension is in the educational spotlight currently, simply teaching students to be better readers will not solve the problems highlighted by today's employers. However, career and technical education excel at making academic subjects relevant and bringing them to life (Peckham, 2004). Literacy is one component of a nation's capacity to educate their people (Kazis, 2005). The same report identified advancing the mathematical skills of students' increases the probability of a stable, if not advancing, economic growth to challenge the global marketplace. Kazis' (2005) believes we must better educate students to meet the upcoming challenges. Vocational and academic disciplines are important; yet, their greatest potential for most communities lies in their unique interdisciplinary value for preparing citizens to live and work (Harmon, 2003). However, many, if not most career and technical education students graduate with insufficient skills in math, communications and problem solving to be successful in the emerging workplace or higher education (Stone, 2003).

## Legislation

Besides employers being concerned about high school graduates' basic skills, legislators are also concerned and have passed several legislative acts designed to improve students' basic skills. Three key pieces of legislation affect the secondary and post-secondary education system –the reauthorization of the 2001 Elementary and

Secondary Education Act (No Child Left Behind), the 1998 Higher Education Act (HEA), and the Individuals with Disabilities Education Act (IDEA). Failure to meet the requirements of these legislative acts can cause major consequences.

One reason for the current emphasis on reading and mathematics in secondary education programs is the No Child Left Behind Act of 2001. The goal of the No Child Left Behind Act is to equip every child with the knowledge and skills to become lifelong learners (Miller, 2002). No Child Left Behind has increased school district accountability in the area of student achievement. Those schools not meeting adequate yearly progress may forfeit federal funding or be labeled as failing. The legislative piece address' the condition of literacy and mathematics of the American school systems.

The main legislation affecting colleges and universities is the 1998 reauthorization of the Higher Education Act, requiring colleges and universities with teacher preparation programs to improve teacher achievement through better preparation and professional development. (Higher Education Act, 1965).

Components of the Higher Education Act (1965) include the evaluation of the characteristics of preservice teacher preparation and recommendations for changes in the content and structure of those preparation programs (Hammond & Sykes, 2003).This Act also aims to increase student achievement across curricular areas, improve methods courses, and improve introductory education courses. Because of the Higher Education Act, revisions have been made in mathematics and reading instruction in teacher education programs (Government Document 2003-8).

The Carl D. Perkins Vocational and Applied Technology Education Act of 1990, a leading source for vocational education funding, clearly prescribes a method to upgrade

vocational education by requiring an integration of academic and vocational curricula (Heaviside, Carey, Farris, Westat, Carpenter, 1994). The assessment process for Carl Perkins Act programs emphasizes the assessment of students' academic skills.

Reports published decades earlier, i.e. *A Nation at Risk* and the *Coleman* Report, continue to affect the emphasis on academic subjects. The highly visible *A Nation At Risk Report* called for a sound base of study in areas including English language development and writing along with computational and problem solving skills (US Department. of Education, 1983). The 1983 A Nation At Risk reported 41 percent of time in preservice teacher education programs is spent in coursework other than education methods courses preparing educators to teach mathematics in an integrated approach. The *Nation at Risk* report suggested America was riding a tide of mediocrity in educational attainment and likened it to a catastrophe destroying the entire American education system while the Coleman report took aim at the schools attended by minority pupils and their academic achievement (Coleman, 1966).

Historically, government reports and legislation attempt to address the ailments of academic deficiencies as seen by the political structure at the time and have assessment data and procedures designed to drive large gains in student progress (Rebora, 2004).

As college campuses across the country explore ways to strengthen interdisciplinary studies to meet the requirements of current legislation (NCLB, HEA, and IDEA), questions emerge about how to best integrate existing course offerings and majors, develop curricular rigor and agility, and strengthen administrative coordination.

Over the years, various legislative acts have placed emphasis on teaching basic skills including reading and math. As the professional literature indicates, with increasing

emphasis on testing students' academic abilities and punishing schools that do not make satisfactory improvements, more career and technical education courses must integrate basic skills. However, the literature does not indicate whether the career and technical education teachers are prepared to teach those skills or to what extent they actually integrate those basic skills.

## Research Methods

The research design used to address the problem of this research was the descriptive research design, a type of non-experimental quantitative research method. Survey methodology involving the design and administration of survey instruments was the research method used in this study. With the survey method, a researcher asks questions about behavior, attitudes, beliefs, and intentions concerning a given subject. Based on the data collected in a survey, a researcher can make inferences about the factors that underlie the behavior (Borders, 1988). Survey research was used in this study in order to identify the attitudes and perceptions of secondary education business teachers and college/university business teacher educators regarding the integration of reading and math instruction in business courses.

The items on the survey instrument were based on a review of literature and the research objectives of this study. The review of literature revealed no appropriate instruments were available so the researcher developed the survey instruments. Two survey instruments were designed: one to gather perceptions of secondary education business teachers and the other to gather perceptions of college/university business teacher educators. Appendix A presents the instrument used to collect data from business/computer teachers and Appendix B presents the instrument used to collect data from business teacher educators.

Internal validity was controlled through the use of clearly worded instructions and questions in the survey instrument and understandable directions in all related correspondence. During the survey development and pilot survey, sources of error can involve questions not being clearly stated leading to individual respondent interpretation,

ambiguous questions and unclear instructions. Those sources of error were minimized or eliminated during the survey development process and after receiving results of the pilot survey.

Content and face validity were established using two experts chosen based on their knowledge and experience. The surveys were administered to a pilot group consisting of three high school business teachers and two university business teacher educators. Respondents indicated that it took less than five minutes to complete the instrument. Based on the pilot survey, changes were made to the order of the survey questions and minor additions were made to the content of two questions.

The subjects for this study included two populations: (1) secondary business teachers in Kansas and (2) college/university business teacher educators from across the United States. To increase the return rate from secondary business teachers, the Kansas secondary business teacher surveys were administered using two separate methods: (1) the survey instrument was administered to a convenient group of 90 secondary business teachers attending the Emporia State University Annual Computer and Business Teacher Conference and (2) the survey was mailed to a sample of 203 Kansas secondary business teacher names. The systematic sampling was completed by selecting every fourth high school business teacher from a comprehensive listing of 1,048 Kansas business teachers, compiled by Emporia State University. After the names of teachers who had already filled out the survey at the Annual Computer and Business Teacher Conference were excluded from the random sample, 203 surveys were mailed. The number of surveys completed at the Emporia State University Annual Computer and Business Teacher

Conference was 90; the number of returns from the mail-out surveys was 86 (42 %). A total responses of 176 secondary business teachers filled out the survey.

The second population surveyed in this study was college/university business teacher educators. The population of college/university's offering bachelor's degrees in business education was obtained from the National Business Education Association ("Institutions Offerings Degrees," 2005). One business teacher educator from each of the 85 colleges/universities that offer bachelor's degrees in business education was sent a cover letter, the survey instrument, and a self-addressed, stamped envelope. Of the 85 surveys mailed to business teacher educators, 41 (48.24%) were returned and usable.

For the purposes of this study, secondary business teachers include both business and computer teachers.

The researcher recognized a lower-return rate than expected for both the surveys of secondary business teachers and business teacher educators; however, due to time limitations on this project a follow-up survey was not possible. It is recognized teachers attending a professional development conference might have different behaviors and perceptions than those who were randomly sampled from a population of all Kansas high school business teachers.

Data were analyzed in terms of the number and percent of secondary business teacher and college/university business teacher educator responses to the questions on the two surveys.

## Results

The purpose of this study was to determine the type and amount of preparation secondary education business teachers have to teach reading and math skills, to determine the scope of reading and math integration in business courses, and to determine the importance of reading and mathematics instruction at various grade levels.

Two survey instruments were used. One instrument was administered to a sample of secondary business teachers in Kansas. A convenient population of 90 secondary Kansas business teachers attending a conference filled out that survey. Additionally, 203 secondary education business teachers in Kansas were randomly selected for a mail-out survey. Of those secondary business teachers, 86 filled out and returned the survey for a response rate of 42 percent. A second survey instrument was sent to 85 business teacher educators at colleges and universities across the United States with a response of 41 (48.24 %).

Research Question 1: Do business teachers and business teacher educators have adequate preparation to integrate reading and math skills in business courses?

The data collected in this study show a majority of business teachers, 97 or 55.11%, indicated they did not have "adequate training" to integrate reading in business courses while 72 or 40.90% perceive they did have "adequate training". When asked on the perception of preparation to integrate mathematics; the majority of respondents, 105 or 59.66% indicated they did not have adequate training while 65 or 36.93% felt they did have adequate training. See table 1.

A majority of business teacher educators, 27 or 65.85% indicated they did have adequate training to teach the integration of mathematics while 14 or 34.15% indicated

they did not have adequate training to teach the integration of mathematics. Their perception on their preparation to teach integrated reading found 27 or 65.85% felt they did have adequate training, while 14 or 34.15% felt they did not have adequate training. See Table 1.

Table 1

Perception of Adequacy of Preparation to Integrate Reading and Math Instruction in Business Courses Given in Percents

| | Adequate Preparation To Teach Reading | | Adequate Preparation To Teach Math | |
|---|---|---|---|---|
| | % Yes | % No | % Yes | % No |
| Secondary Business Teachers * | 40.90 | 55.11 | 36.93 | 59.66 |
| Business Teacher Educators | 65.85 | 34.15 | 65.85 | 34.15 |

Note. n= 176 Secondary Teachers and n=41 Business Teacher Educators
* Seven secondary business teachers did not respond to this question so the percents do not equal 100%.

Research Question 2: Do business teachers and business teacher educators believe it is important to teach reading and math skills in high school business courses?

The data collected in this study show a majority of secondary business teachers, 100 or 56.82 percent, perceive it is "very important" to teach reading skills in secondary school business courses while 27.27 percent of the teachers perceive it is somewhat important. Under 3 percent of the teachers perceive it to be "somewhat unimportant" or "not important" to teach reading in business courses. About 8.5 percent of the respondents were neutral in their response to this question. See Table 2.

A majority, 96 or 55 percent, of the secondary business teachers surveyed, perceive it is "very important" to teach math skills in secondary school business courses while 48 or 27.27 percent of the teachers perceive it is somewhat important to teach math in business courses. Less than 3 percent of the teachers perceive it to be "somewhat unimportant" or "not important" to teach math in business courses, and about 5 percent of the respondents were neutral on the importance of teaching math in business courses. See Table 2.

As shown in Table 2, business teacher educators' perception of the importance of teaching reading and math in secondary business courses is quite high with over 78 percent of them indicating it is "very important" to teach math and reading.

Table 2
Business Teachers' and Teacher Educators' Perception of the Importance of Integrating Math and Reading in Business Courses

| | Secondary Business Teachers | | | | Bus. Teacher Educators | | | |
|---|---|---|---|---|---|---|---|---|
| | Reading | | Math | | Reading | | Math | |
| | No. | % | No. | % | No. | % | No. | % |
| Very Important | 100 | 56.82 | 96 | 54.55 | 35 | 82.37 | 32 | 78.05 |
| Somewhat Important | 48 | 27.27 | 58 | 32.95 | 5 | 12.20 | 7 | 17.07 |
| Neutral | 15 | 8.52 | 8 | 4.55 | - | - | 2 | 4.88 |
| Somewhat Important | 3 | 1.70 | 3 | 1.70 | 1 | 2.44 | - | - |
| Not Important | 1 | 0.57 | 2 | 1.14 | - | - | - | - |
| No response | 9 | 5.10 | 9 | 5.10 | 1 | 2.44 | 1 | 2.44 |

Note. n=176 Secondary Business Teachers and n=41 Business Teacher Educators

Research Question 3: Who do secondary business teachers believe is responsible for teaching reading and math skills at the secondary school level?

Respondents could choose more than one answer to this survey question, a question providing choices of reading specialists, English teachers, math teachers, all academic and vocational/technical teachers, and joint responsibility of all the previously stated individuals and groups. Of the 176 secondary business teachers responding to the survey, 118 or 67.05 percent believe teaching reading is the joint responsibility of all teachers and 115 or 65.34 percent believe teaching math is the joint responsibility of reading specialists, English and math teachers, all academic teachers and vocational/technical teachers. See Table 3. However, 35 or 19.89 percent of the respondents indicated that teaching reading is a responsibility of reading specialists at the secondary school level, 62 or 35.23 percent indicated that reading is a responsibility of English teachers, and 41 or 23.30 percent indicated that teaching math is the responsibility of math teachers.

Table 3

Secondary Business Teachers Perception of Who is Responsible for Teaching Reading and Math at the Secondary School Level *

| | Teaching Reading | Teaching Mathematics |
|---|---|---|
| | % | % |
| Reading Specialist | 35 | - |
| All Academic and Vocational/ Technical Teachers | 38 | 43 |
| Mathematics Teacher | - | 41 |
| English Teacher | 62 | - |
| Joint Responsibility of All the Above Individuals | 118 | 115 |

Note: n= 176

* More than one response was possible.

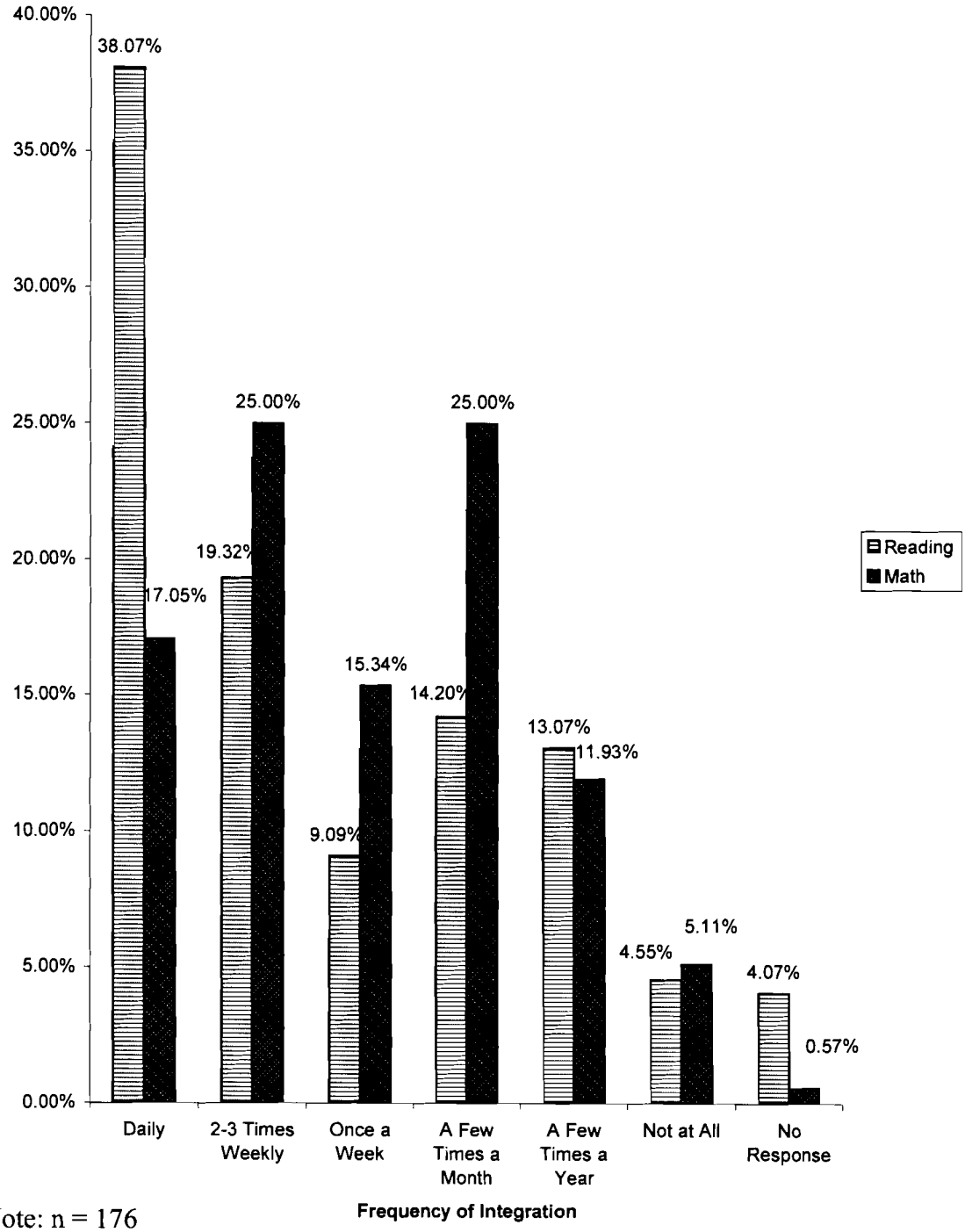
Research Question 4: How frequently do business teachers and teacher educators integrate reading and math instruction?

Of the secondary business teachers who responded to the survey, 67 or 38.07 percent indicated they integrate reading in their business courses on a "daily basis". However, 55% of secondary business teachers integrated reading less frequently, i.e., "2-3 times a week," "once a week," a "few times a month," or "a few times a year."

Fewer high school business teachers, 17 percent, integrate math on a daily basis than integrate reading, 38 percent. In fact, about one-fourth of the secondary business teachers integrate math "2-3 times a week" and another one-fourth of the secondary business teachers surveyed integrate math "a few times a month". Only about 5 percent of the secondary business teachers do not integrate reading or math instruction in business courses. See Figure 1.

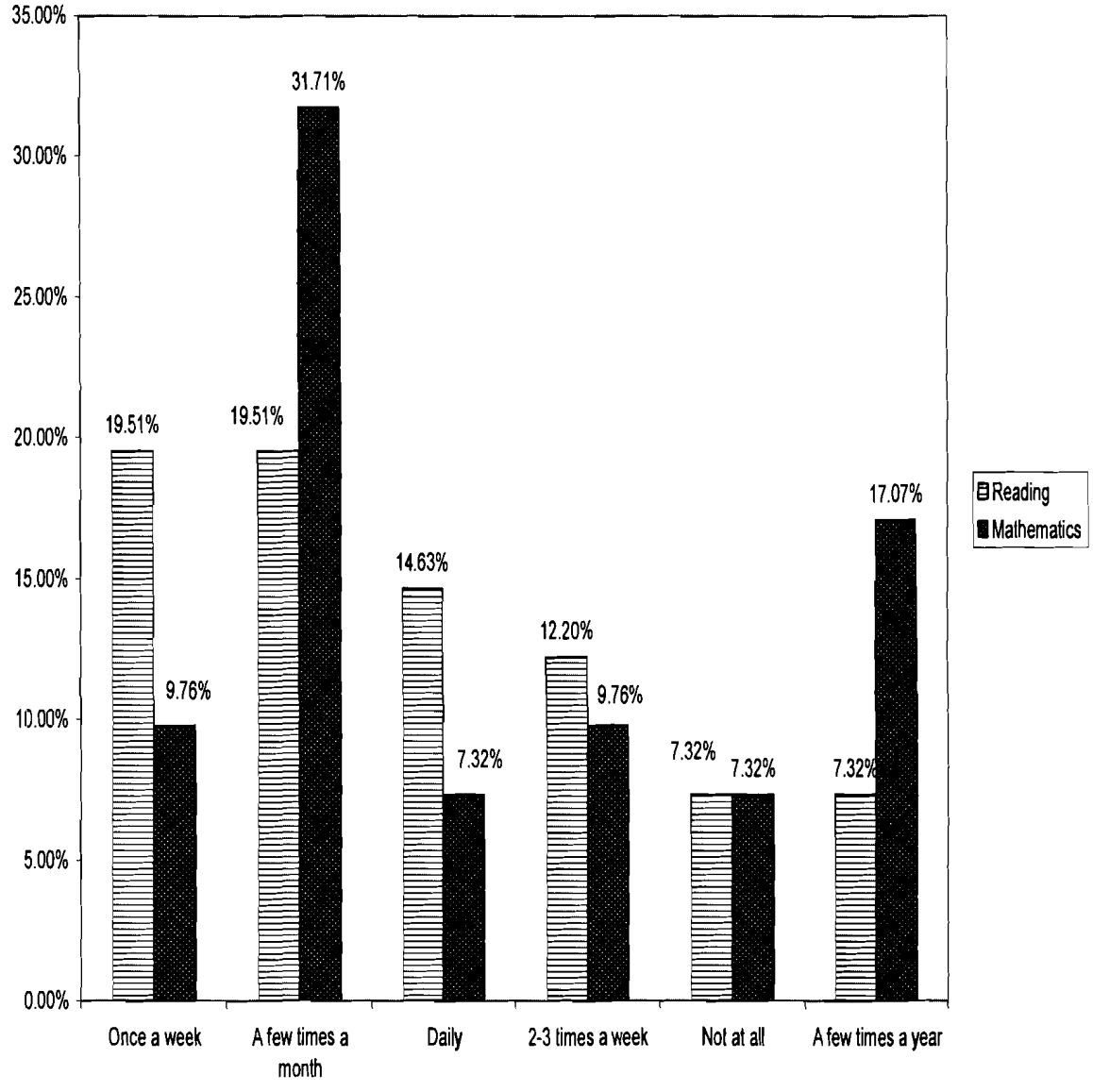
Only 15% of business teacher educators indicated that reading instruction is integrated on a daily basis in business courses; a larger percent (20 percent) indicated reading integration once a week. Math skills were integrated in college/university business teacher education courses even less frequently than reading with math skills being integrated a few times a month by 32 percent of the respondents. Less than 8 percent of business teacher educators reported they did not integrate reading or math. See figure 2.

Figure 1. Frequency of Integrating Mathematics and Reading in Business Courses by Secondary Business Teachers.




Note: n = 176

Figure 2. Frequency of Integrating Mathematics and Reading in Business Courses by Business Teacher Educators.




Note: n = 41

Research Question 5: What instructional methodologies do business teachers and business teacher educators use to teach reading and math?

Table 4 shows the instructional reading methods used by secondary business teachers and taught to pre-service business teachers by college/university business teacher educators. The business teacher educators were asked to identify the specific reading methods and types of math problems covered in their entire business teacher education program including general education, business content, teaching methods, and professional education courses.

"Summarizing" and "note taking" were tied (46 percent) as being the reading methods used most frequently by secondary business teachers. The reading method used most frequently within pre-service business teacher education programs was "note taking," used by 27 or 65.85 percent of the respondents followed by "journalizing" with 26 or 63.41 percent. See Table 4.

Table 4

Instructionall Reading Methods Used by Secondary Business Teachers and Taught by Business Teacher Educators

| Methods used | Secondary Bus. Teachers | | Bus Teacher Educators | |
|---|---|---|---|---|
| | No. * | % | No. * | % |
| Note-taking | 46 | 26.14 | 27 | 65.85 |
| Summarizing | 46 | 26.14 | 24 | 58.54 |
| Reading aloud | 43 | 24.43 | 19 | 46.34 |
| Graphic organizers | 39 | 22.16 | 19 | 46.34 |
| Compare and Contrast | 26 | 14.77 | 24 | 58.54 |
| 6-trait reading | 26 | 14.77 | 5 | 12.20 |
| Reading guide | 20 | 11.36 | 12 | 29.27 |
| Journalizing | 11 | 6.25 | 26 | 63.41 |
| Pair-sharing | 9 | 5.11 | 18 | 43.90 |
| Word maps | 8 | 4.55 | 10 | 24.39 |
| Web maps | 5 | 2.84 | 14 | 34.15 |
| Don't know | 12 | 6.82 | 5 | 12.20 |
| Other | 38 | 61.59 | - | - |

Note: n= 176 secondary business teachers n=41business teacher educators.
* More than one response was possible.

Table 5 shows the types of math problems taught by secondary business teachers in high school business courses and taught within business teacher education licensure/certification programs by business teacher educators. The types of math problems taught most frequently by secondary business teachers were addition and subtraction. The math problems taught most frequently within business teacher education licensure/certification programs at the college/university level were "multiplication" and "division". The math skills taught least frequently by secondary business teachers were "fractions" and "statistics" and the skill taught least frequently by business teacher educators was "formulas."

Table 5

Types of Mathematical Problems Covered in Business Courses

| Mathematical Problems | Sec Bus. Teachers | | Bus. Teacher Educators | |
|---|---|---|---|---|
| | No. * | % | No. * | % |
| Addition | 64 | 36.36 | 26 | 63.41 |
| Subtraction | 63 | 35.80 | 26 | 63.41 |
| Multiplication | 62 | 35.23 | 27 | 65.85 |
| Division | 61 | 34.66 | 27 | 65.85 |
| Formulas | 60 | 34.09 | 15 | 36.59 |
| Word Problems | 49 | 27.84 | 19 | 46.34 |
| Statistics | 34 | 19.32 | 18 | 43.90 |
| Fractions | 32 | 18.18 | 18 | 43.90 |

Note: n = 176 business teachers n = 41 business teacher educators
* More than one response was possible.

Research Question 6: When do pre-service and in-service business teachers receive instruction on how to integrate reading and math instruction in business courses?

The perception of current in-service secondary business teachers is that they learned reading integration teaching methods after becoming a teacher (48 %) and primarily through secondary school in-service teacher training seminars. Only 27 percent of the secondary business teachers received this type of instruction prior to receiving their teaching certificate/license. Almost one/fifth of the secondary business teachers (18 %) have not received any instruction on how to integrate reading into their business courses. Of those who did receive pre-service training on reading integration, most of them reported receiving such instruction in a separate reading course.

Forty-five percent of the secondary business teachers learned methods of integrating mathematics after they became teachers through in-service teacher training seminars, as shown in Table 6. Only 13 percent of the secondary business teachers learned how to integrate math into business courses prior to receiving their teaching certificate/license. Additionally, a larger percent of secondary business teachers (30%) indicated that they received no instruction on how to integrate mathematics into business courses as compared to those (18 %) who had received no instruction on how to integrate reading.

A majority of business teacher educators, 22 or 53.66 percent indicates pre-service business teacher education students receive training to integrate reading "prior to receiving a teaching certificate/license as compared to receiving "no instruction." The majority of business teacher educators, 27 or 65.85 percent indicate teachers receive integrated reading methods training in "a professional education course" as compared to a

business teaching methods course ( 23 or 56.10 percent) or " in a separate course on reading" (16 or 39.02 percent). Less than 10 percent of business teacher educators report their students "receive no instruction." See table 6.

Table 6

Time and Location of Pre-service and In-service Training in Reading and Math Integration as Perceived by Secondary Business Teachers and Business Teacher Educators Expressed in Percentages

| | Sec. Bus Teachers | | Bus. Teacher Educators | |
|---|---|---|---|---|
| | Reading % | Math % | Reading % | Math % |
| Prior to receiving a teaching Certificate/license | 27.27 | 13.07 | 53.66 | 41.46 |
| In a separate course on reading Or math education | 19.32 | 3.98 | 9.09 | 21.95 |
| In a professional education course | 10.80 | 6.25 | 15.34 | 43.90 |
| In a business teaching methods course | 13.64 | 10.23 | 13.07 | 58.54 |
| After becoming a teacher | 48.30 | 39.20 | - | - |
| In an in-service training seminar | 53.98 | 44.89 | - | - |
| In graduate course work | 10.23 | 4.55 | - | - |
| Other | 7.95 | - | 24.40 | 2.44 |
| Received no instruction | 18.18 | 30.11 | 7.32 | 12.20 |

Note: n = 176 business teachers n = 41 business teacher educators
* More than one response was possible.

## Conclusions and Recommendations

Research Question 1. Do business teachers have adequate preparation to teach reading and math skills? Results indicate that the majority of secondary business teachers perceive they are not adequately prepared to integrate reading and/or math instruction in their business classes. More of them perceive they are not adequately prepared to integrate math in business courses than to integrate reading in business courses. The majority of the business teacher educators, 65.85 percent, perceive they are adequately prepared to teach reading and the same percent, 65.85 percent, perceive they are adequately prepared to teach math.

Research Question 2. Do business teachers believe it is important to teach reading and math skills in business courses? Secondary business teachers believe it is quite important to integrate both mathematics and reading instruction in business courses at the high school level. The survey results show that over 86 percent of the secondary business teachers perceive it is either somewhat or very important to integrate math instruction and about 84 percent perceive it is somewhat important or very important to integrate reading instruction in high school business courses. Likewise, over 78 percent of business teacher educators perceive it is somewhat important or very important to integrate both reading and math instruction in business courses.

Research Question 3. Whose responsibility is it to teach reading and math skills? Secondary business teachers perceive that it is the responsibility of reading specialists, all academic teachers, and all vocational technical teachers to teach reading and math at the secondary school level. In fact, over 65% of the secondary business teachers indicated that it is the joint responsibility of all of those individuals to teach reading and math.

Research Question 4. How frequently do business teachers integrate reading and math instruction in their business courses? Based on the survey results from the secondary business teachers, reading is integrated into the secondary business courses on a daily basis more frequently than math. A majority of the secondary business teachers, about 57 percent, integrate reading instruction in their business courses either on a daily basis or 2-3 times a week. Only a small number of secondary business teachers, approximately 5 percent, indicated they do not integrate reading or math instruction in business courses.

Fewer secondary business teachers integrate math instruction daily or 2-3 times a week than integrate reading instruction that frequently. About 42 percent of the secondary business teachers integrate math instruction daily or 2-3 times a week, but nearly as many integrate math (37 percent) only a few times a month or a few times a year. A very small number of secondary business teachers, approximately 5 percent, do not integrate math instruction in business courses.

At the college/university level, reading instruction and math problems are integrated less frequently in business courses than at the secondary school level. Only about 15 percent of the business teacher educators integrated reading instruction on a daily basis as compared to 38 percent of secondary business teachers. Only 7 percent of the business teacher educators indicated math is integrated daily; this compares unfavorably to the 17 percent of secondary business teachers who integrate math daily.

Research Question 5. What instructional methodologies do business teachers use to teach reading and math? Differences exist between the reading methods used by secondary business teachers and those taught in college/university business teacher

education pre-service programs. Summarizing and note-taking were the specific instructional reading methods used most frequently by secondary business teachers but note-taking and journalizing were the reading methods used most often at the college/university level. Web maps and word maps were the methods used least frequently by secondary business teachers while 6-trait reading method taught least frequently in college/university business teacher education programs.

In general, low-level math problems were taught at both the secondary school level and in college/university business teacher education programs. Addition, subtraction, multiplication, and division were the types of math problems covered most frequently by secondary business teachers. Fractions and statistics were taught least frequently by secondary business teachers. Multiplication and division were the two types of math problems covered most frequently within business teacher education programs; formulas were covered least frequently in those programs.

Research Question 6. When do pre-service and in-service business teacher education students receive instruction on how to integrate reading and math in business courses? The primary time when secondary business teachers learned how to integrate reading and math skills within business courses was after becoming a teacher through in-service teacher training. One possible explanation is that many secondary business teachers receive their teaching certificates/licenses before the emphasis on high stakes testing in secondary schools occurred. Yet, almost one-third of the secondary teachers received no training in how to integrate math in business courses and about twenty percent received no training in how to integrate reading in business courses.

Business teacher educators perceive they are teaching pre-service business teachers to integrate reading and math instruction prior to the pre-service business teacher receiving a teaching certificate/license with a minimal number of business teacher education students receiving no methods of integrated instruction during their teacher certificate/license preparation.

Overall, both secondary business teachers and business teacher educators appear to believe that teaching reading and math skills within business courses is quite important. Secondary business teachers have primarily received training on how to integrate reading and math skills in their business courses after receiving their teaching degree and through in-service teacher training seminars. Since the basic skills integration movement occurred after many business teachers received their degrees, it is understandable that many of them received their instruction through in-service training.

This research study indicates that secondary business teachers are integrating reading and math instruction in business courses, an approach recommended by Dupuis and Merchant (1993), Norwich Free Academy (1991), and Meyer (1991).

Overwhelming, secondary business teachers believe that teaching reading and math is the joint responsibility of all teachers and reading specialists to teach reading and math at the secondary level, a philosophy espoused by Meltzer (2002).

While only 19 percent of vocational teachers feel prepared to teach mathematics according to Heaviside, Carey, Farris, Westat, Carpenter (1994), 37 percent of the secondary business teachers responding to this survey indicated they are adequately prepared to teach math. However, one should still be concerned with the integration of math in business courses as it is not integrated by secondary business teachers as

frequently as reading. Since only 37 percent of 12th grade students perform at a basic level on the math part of standardized tests (Stone, Alfeld, Pearson, Lewis & Jensen, 2005), more time and effort should be spent on math instruction in secondary business courses.

In future surveys, it is recommended the definition of integration be defined clearly. Although many secondary business teachers integrate reading on a daily basis, it is unclear as to whether they actually "teach reading skills" on a daily basis or merely have students read from a textbook, printed document or the Internet. Future surveys should include an option of "other" when teachers are asked when they received instruction on integration after they had become a teacher.

Further research that expands the study to include the integration of written English skills is recommended.

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# Appendices

## Appendix A: High School Business Teacher Survey

### Integration of Reading and Math Instruction in Business & Computer Courses

1. When did you receive instruction on how to integrate reading and math instruction in business/computer courses? (Check all that apply.)

| Reading | Math | |
|---|---|---|
| _____ | _____ | Prior to receiving my teaching certificate/license: |
| _____ | _____ | In a separate course on reading or math education |
| _____ | _____ | In a professional education course |
| _____ | _____ | In a business teaching methods course |
| _____ | _____ | After becoming a teacher: |
| _____ | _____ | In in-service training seminars |
| _____ | _____ | In graduate course work |
| _____ | _____ | Other (describe it) _____ |
| _____ | _____ | Received no instruction on integration |

2. Have you had adequate training to integrate reading and math instruction in business/computer courses?

___ Yes ___ No Reading instruction
___ Yes ___ No Math instruction

3. How frequently do you integrate reading and math instruction in the courses that you teach?

| Reading | Math |
|---|---|
| ___ Daily | ___ Daily |
| ___ 2-3 times a week | ___ 2-3 times a week |
| ___ Once a week | ___ Once a week |
| ___ A few times a month | ___ A few times a month |
| ___ A few times a year | ___ A few times a year |
| ___ Not at all | ___ Not at all |

4. Whose responsibility is it to teach reading and math at the secondary school level? (Use check marks)

| Reading | Math | |
|---|---|---|
| _____ | _____ | Reading specialists |
| _____ | _____ | English teachers |
| _____ | _____ | Mathematics teachers |
| _____ | _____ | All academic and vocational/technical teachers |
| _____ | _____ | Joint responsibility of all the above individuals |

5. How important is it for high school business teachers to integrate reading and math skills in business courses? (Circle the appropriate numbers.)

| | Not Important | Somewhat Unimportant | Neutral | Somewhat Important | Very Important |
|---|---|---|---|---|---|
| Reading | 1 | 2 | 3 | 4 | 5 |
| Math | 1 | 2 | 3 | 4 | 5 |

6. What specific instructional reading methods do you use?

| | | | | | |
|---|---|---|---|---|---|
| ____ | Reading Aloud | ____ | Word Maps | _____ | Web Maps |
| ____ | Reading Guide | ____ | Pair-Sharing | _____ | Graphic Organizers |
| ____ | Journaling | ____ | Note-taking | _____ | 6-Trait reading |
| ____ | Summarizing | ____ | Compare and Contrast | | |

7. What types of mathematical problems do you cover in your business courses?

| | | | |
|---|---|---|---|
| _____ | Addition | _____ | Fractions |
| _____ | Subtraction | _____ | Statistics |
| _____ | Multiplication | _____ | Word problems |
| _____ | Division | _____ | Formulas |
| _____ | Other (describe)_____ | | |

Thank you for filling out the survey!

Appendix B: Business Teacher Educator Survey

# Integration of Basic Skills in Business Teacher Education Programs

1. At what point do business teacher education students at your college/university receive instruction on how to integrate reading, writing, and mathematics instruction in business courses? (Check all that apply.)

| Reading | Writing | Math | |
|---|---|---|---|
| _____ | _____ | _____ | Prior to receiving a teaching certificate/license |
| _____ | _____ | _____ | In a separate course on reading or math education |
| _____ | _____ | _____ | In a professional education course |
| _____ | _____ | _____ | In a business teaching methods course |
| _____ | _____ | _____ | Other (describe it) _____ |
| _____ | _____ | _____ | Receive no instruction |

2. In your opinion, how important is it for high school business teachers to integrate reading, writing, and math skills in business courses? (Circle the appropriate numbers.)

| | Not Important | Somewhat Unimportant | Neutral | Somewhat Important | Very Important |
|---|---|---|---|---|---|
| Reading | 1 | 2 | 3 | 4 | 5 |
| Writing | 1 | 2 | 3 | 4 | 5 |
| Math | 1 | 2 | 3 | 4 | 5 |

3. Have you had adequate preparation to teach the integration of reading, writing, and math instruction in business/computer courses?

Reading instruction ___ Yes ___ No
Writing instruction ___ Yes ___ No
Math instruction ___ Yes ___ No

4. Of the courses taught in your preservice business teacher educator program, how many different ones involve the integration of reading, writing and math teaching methodologies? (Circle the appropriate numbers.)

# of Courses
0 1 2 3 4 Include integration of reading instruction
0 1 2 3 4 Include integration of writing instruction
0 1 2 3 4 Include integration of math instruction

Note: If you circled 0 for all parts of question 4, you may skip questions 5-7.

5. How frequently do you integrate reading, writing and math teaching methods in the courses in your business teacher educator program?

| Reading | Math | Writing |
|---|---|---|
| ___ Daily | ___ Daily | ___ Daily |
| ___ 2-3 times a week | ___ 2-3 times a week | ___ 2-3 times a week |
| ___ Once a week | ___ Once a week | ___ Once a week |
| ___ A few times a month | ___ A few times a month | ___ A few times a month |
| ___ A few times a year | ___ A few times a year | ___ A few times a year |
| ___ Not at all | ___ Not at all | ___ Not at all |

6. What specific instructional reading methods are covered in the business teacher education program (including general education, business content courses, and teacher education)?

| | | |
|---|---|---|
| ____ Reading Aloud | ____ Word Maps | _____ Web Maps |
| ____ Reading Guide | ____ Pair-Sharing | _____ Graphic Organizers |
| ____ Journaling | ____ Note-taking | _____ 6-Trait reading |

____ Summarizing ____ Compare and Contrast _____ Don't know

7. What types of math problems are covered in the business teacher education program?

_____ Addition
_____ Subtraction
_____ Multiplication
_____ Division
_____ Other (describe) _____

_____ Fractions
_____ Statistics
_____ Word problems
_____ Formulas

(OVER)

8. What English writing skills are covered in your business teacher education program?

____ Grammar
____ Spelling
____ Punctuation
____ Writing letters
____ Writing reports
_____
____ Writing emails
____ Writing term papers

____ Constructing paragraphs
____ Writing clearly
____ Writing concisely
____ Creating PowerPoint presentations
____ Other (describe)

Please return this survey by April 4, 2006!

Appendix C: Business Teacher Survey Introduction Letter

Frederick W. Polkinghorne
505 W. Cherry Street ♦ Winfield, MO 63389 ♦ 636-328-2248

May 11, 2006

Dear Business/Computer Teacher:

First and foremost, thank you for participating in the enclosed survey: *Integrating Mathematics and Reading in Business/Computer Courses.*

The implementation of No Child Left Behind legislation has created pressure on all schools, elementary through high school, to assure that every child has reached a proficient level in reading and math at graduation.

Conventional thinking and teaching methods are changing; some believe that it is no longer the English and Math departments' sole responsibility to instruct students in these core areas; it is a partnership with all teachers across all disciplines to integrate reading and math instruction into their classroom instruction. As a result of this paradigm shift, some business teachers are being asked to not only teach business content, but also become reading and math teachers.

As a student in the Master of Science in Business Education program at Emporia State University, I am requesting your assistance. By filling out the enclosed survey, you will help me identify the education/training you have had to teach reading and math and the extent to which you teach those skills.

Thank you in advance for returning this survey by March, 24 2006 in the enclosed postage paid envelope.

Cordially,

Frederick W. Polkinghorne
Graduate Student – Emporia State University

Appendix D: Business Teacher Educator Survey Letter

Frederick W. Polkinghorne
505 W. Cherry Street ♦ Winfield, MO 63389 ♦ (636) 328-2248

March 15, 2006

Dear

Implementation of the No Child Left Behind legislation has created pressure on all teachers to prepare students to be proficient in basic skills prior to graduation. The logical question for business teacher educators is "Do students in business teacher licensure/certification programs receive adequate course work to prepare them to integrate basic skills, such as reading and mathematics, in business courses that they will teach at the secondary school level?"

As a student completing my thesis for the Master of Science in Business Education program at Emporia State University in Emporia, Kansas, I am asking your assistance in gathering data concerning the amount and type of reading and mathematics course work that business teacher education students at your college/university receive.

Would you be willing to take approximately five minutes to fill out the enclosed survey and provide information that ultimately could help all business teacher educators across the country?

Please fill out the enclosed survey and return it to me in the postage paid envelope by April 5, 2006. Your assistance is greatly appreciated.

Sincerely,

Frederick W. Polkinghorne
Graduate Student
Emporia State University

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I, Frederick William Polkinghorne, hereby submit this thesis/report to Emporia State University as partial fulfillment of the requirements for an advanced degree. I agree that the Library of the University may make it available to use in accordance with its regulations governing materials of this type. I further agree that quoting; photocopying, or other reproduction of this document is allowed for private study, scholarship (including teaching) and research purposes of a nonprofit nature. No copying, which involves potential financial gain, will be allowed without written permission of the author.

Frederick W. Polkinghorne
Signature of Author

April 19, 2006
Date

Integration of Reading & Math
Title of Thesis

Signature of Graduate Office Staff

5-12-06
Date Received