The Timeliness of Keyboarding Instruction as Perceived by
Middle School Business Instructors in an Urban School District

by
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Approval Page

This applied dissertation was submitted by Yvonne M. Ash under the direction of the persons listed below. It was submitted to the Fischler School of Education and Human Services and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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I thank God for allowing me to persevere in this life. Throughout my career, I have had an opportunity to work with wonderful parents and students. God gave me a vision to improve an aspect of the educational service delivery to children in an effort to prepare them for fulfillment of their life's goals and dreams. Being blessed with a career that I absolutely love has caused me to become a researcher in the classroom.
Abstract


This applied dissertation study was designed to investigate teachers' perceptions of students in Grade 6 who entered middle schools with little or no keyboarding skills. The researcher investigated whether Grade 6 was an appropriate level for initial keyboarding instruction. For educational leaders to successfully implement the national strategy of the infusion of technology into education, perceptions of school policies on the timeliness of keyboarding instruction to children had to be addressed and had to undergo periodic internal assessments.

A mixed-methods comparative analysis of both qualitative and quantitative data was used. The data that were collected from the keyboarding education survey, respondents' interviews, and teacher telephone interviews were triangulated to determine the perceptions of middle school business instructors about the timeliness of keyboarding instruction. The following five research questions were investigated: (a) What are the percentages of sixth graders entering middle school with little or no keyboarding skills the in local schools and district, (b) what are the perceptions of local middle school business teachers on the timeliness of keyboarding instruction, (c) how do the perceptions of the timely policy for teaching keyboarding to students by middle school teachers compare with the local district's policy on timeliness, (d) when literature is researched on the timeliness of keyboarding instructions to children, what will be the recommendation, and (e) how do the perceptions of business teachers compare with those of the writers of the reviewed literature regarding the timeliness of keyboarding instruction of children?

An analysis of the data indicated a broad array of opinions on the timeliest grade to initiate keyboarding instruction. The keyboarding experts in the middle schools of the target school district did not agree upon a single, specific grade. However, a majority of their responses did identify the third and fourth grades as the timeliest levels for the introduction of keyboarding to children. In the final analysis, though, there appeared to be no universal agreement on the timeliness of keyboarding instruction from the data tabulated for this study.
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Chapter 1: Introduction

For the purpose of this applied dissertation, the researcher perceived that a large percentage of students were entering the sixth grade at middle schools in the school district with little or no keyboarding skills. The problem investigated in this study was whether Grades 6 through 8 were appropriate grade levels for teaching basic keyboarding instruction.

Toppe (1991) stated, "Keyboarding is an essential and enabling skill for all students and all workers" (p. 22). Wiggs (1993) believed that the development of proper keyboarding techniques is extremely important for ensuring future efficiency and productivity. In 2006, these statements on the need for students to have competencies in keyboarding skills continue to be valid, as children more and more use computers in elementary and middle schools. Mote and Zahner (2004) found that keyboarding skills should be taught early:

Word processing is a skill that must be taught. There are many thoughts about when keyboarding instruction should begin. The objective of early keyboard education is to allow children to become more proficient in computer use and to avoid the necessity to re-teach keyboarding skills a later time. (p. 1)

Olinzock (1998) addressed keyboarding as a "complex psychomotor skill that requires proper training and considerable practicing to acquire a level of mastery" (p. 46).

Bialo and Sivin-Kachala (1996) revealed that more than 18.1 million computers are in the nation's 109,000 public and private schools and are being used by students from kindergarten through Grade 12. During the 1990s, educational leaders were directed nationally to increase the infusion of technology into education. That directive has led to an increased number of computers on school campuses. As the acquisition of technology hardware has increased, the question being asked is whether educational leaders have
incorporated the technical skill of keyboarding in the core curriculum.

Bartholome (1996) pointed out that more than 50% of the workforce use computers to perform daily job functions and that, throughout the United States, people have over 37 million personal computers in their homes. Students who are not literate in keyboarding will be at a disadvantage in a rapidly, ever changing technological society. Olinzock (1998) believed that it is imperative that students be taught keyboarding skills before applications that require keyboarding are taught and that kindergarten is an appropriate grade to introduce technology in a structured framework. Bunin (2003) contended that, with clear and attainable objectives, students as young as 5 and 6 years of age can learn basic technology concepts, terms, and skills. The business education instructors who participated in this applied dissertation and who taught keyboarding in the target school district believed that a large percentage of students in the public schools lacked keyboarding skills.

Statement and Primary Evidence of the Problem

A policy or instructional process was inappropriate that permitted students to enter the sixth grade at local schools with very little or no keyboarding skills. The target school district indicated that students were expected to enter the sixth grade with basic keyboarding skills. This policy was emphasized in the District Technology Plan for 2002-2007, part of which emphasized that mastering skills of basic word processing was a competency milestone for fifth graders. To master basic word processing, at a minimum, a student has to have basic keyboarding skills. From years of observation, the researcher estimated that 90% to 95% of the students in Grade 6 have had very little or no skills in keyboarding.

With the district's technology competency in place and the increase in the number
of computers in school and at home, one would assume that children 10 to 11 years of age would have had some keyboarding skills as they enter the sixth grade. The researcher hypothesized that this assumption was false. As a result, she saw the need to develop a body of evidence (a) to determine the keyboarding skill levels of sixth graders entering middle school in order to see whether the students in the target school district had achieved the keyboarding milestone, (b) to analyze teachers' perceptions on the timeliest grade level to initiate formal keyboarding skills, and (c) to understand teachers' perceived effectiveness in meeting the keyboarding milestone.

The intervention planned by this study was a review of policies and practices on keyboarding throughout the target school district. This focus and review on keyboarding instruction was vital to the implementation of the vision of integrating technology in education. Newburger (1999, 2000) indicated that keyboarding skills are the essential prerequisite skills for students to access computers. With this understanding, teachers perceived that incoming sixth graders had little or no keyboarding skills and that students in Grades 1 through 5 had not effectively used computers at school or at home.

These observations were measured by a keyboarding pretest administered to incoming sixth graders as a part of the district's curriculum framework in keyboarding strategies and instruction in keyboarding readiness. The pretest was administered every 9 to 18 weeks to a new class of sixth graders. Consistently, the researcher observed the need for teaching initial keyboarding skills to sixth graders. The pretests were conducted in urban and suburban middle schools throughout the target school district as part of the mandated business technology curriculum framework.

**Overview of the Problem Setting**

Too many middle school students were entering Grades 6 through 8 in the public
schools having little or no keyboarding skills, as noted by business teachers' observations. Though some students obviously have benefited from previous keyboarding instruction, the researcher perceived that only a low percentage of students have been proficient in keyboarding strategies, proper techniques, and instruction in keyboard readiness. In 2002, the district adopted a policy to correct this practice. The district was in the 4th year of its plan, and, still, a large percentage of students were entering middle schools with little or no keyboarding skills.

Working as a business technology instructor within the district where the research was conducted, the researcher had 29 years of experience in the district, including 25 years of experience in middle school classrooms. Keyboarding instruction was one of the researcher's specialties. With a significant number of years of experience in the classroom teaching keyboarding, the researcher had established verifiable competencies and exemplary credibility for conducting this study.

**Problem Definition and Evidence of Discrepancy**

Because students continued to enter middle school with little or no keyboarding skills, the following question was asked: Is sixth grade the appropriate level for basic keyboarding instruction to begin? According to the literature, the high percentage of computers in homes and schools means that more children have access to computers than ever before (Bartholome, 1996; Bialo & Sivin-Kachala, 1996). As a result, access to technology has not been the problem. Nevertheless, in the target school district, elementary school students in Grades 4 through 5 have had to wait until they were in Grades 6 through 8 to unlock the power of the computer. The District Technology Plan for 2002-2007 clearly indicated an implemented, proactive policy for proficiency in word processing for its students by the end of the fifth grade.
Why are keyboarding skills low among sixth graders entering middle schools? This practice points to an obvious answer: The students entering middle schools have not acquired the required keyboarding skills. In turn, this lack pointed to a discrepancy between the intent and the practice of the district's own policy. In light of today's fast-moving, superhighway-oriented society, the question is whether sixth grade is the timeliest grade level for initiating basic keyboarding instruction.

Because of the lack of keyboarding proficiency skills, incoming sixth graders have missed out on some of the benefits of using the computer as an educational tool. More specifically, Boyce (1997) noted that the benefits of acquiring keyboarding skills include the enhanced use of time and the effective use of computers. These benefits are more fully available to educators and students through educators teaching and students acquiring keyboarding skills.

Possible Causes

During her career, the researcher has observed a high percentage of students entering the sixth grade with little or no keyboarding skills and has wondered whether her observations were synonymous with those of other middle school teachers. For this reason, she selected middle school business teachers on a voluntary basis to participate in this applied dissertation study to answer this question as well as the following ones: Could there be a district practice of teaching basic keyboarding at the sixth-grade level, could the introduction of formal keyboarding benefit instruction in the curriculum of earlier grades, and would this practice in keyboarding instruction be considered timely? The answers to these queries were essential to the establishment of a district policy that would define an appropriate grade level for the formal teaching of keyboarding as a technical skill.
The answers to these questions would also be an asset to any organization in establishing a uniform and enforced policy on keyboarding instruction. Usually, policies are not successful in implementation without a complementary practice. This district has a policy, yet sixth graders enter middle school with little or no keyboarding skills. Did that, in fact, mean that the policy was really a subjective practice? One of the objectives of this applied dissertation study was to collect and analyze data to answer this question. The supportiveness of administrators, availability of financial resources, and the needed revisions to the existing technology plan could be affected by this research study.

**Research Questions**

The following research questions were investigated:

1. What are the percentages of sixth graders entering middle school with little or no keyboarding skills the in local schools and district?

2. What are the perceptions of local middle school business teachers on the timeliness of keyboarding instruction?

3. How do the perceptions of the timely policy for teaching keyboarding to students by middle school teachers compare with the local district's policy on timeliness?

4. When literature is researched on the timeliness of keyboarding instructions to children, what will be the recommendation?

5. How do the perceptions of business teachers compare with those of the writers of the reviewed literature regarding the timeliness of keyboarding instruction of children?

**Measurable Data**

The researcher conducted an organizational analysis on the timeliness of the district's policy on keyboarding instruction. Actual practices were examined. The evaluation method chosen for this study was total quality management (TQM).
Fitzpatrick, Sanders, and Worthen (2004) explained that TQM is designed to improve organizational efficiency and productivity through examining suppliers, the work process itself, and customer satisfaction. Local middle school business instructors who teach keyboarding were the selected target group to participate in this study. The researcher considered the perceptions of the business instructors as part of the process evaluation on the timeliness of the district's keyboarding instructional policies. These perceptions could very well lead to changes in the district's existing policy design concerning the appropriate grade level for instruction of keyboarding.

The researcher used mixed-methods evaluation procedures and a triangulated TQM research design as the method for data collection and organizational data analysis. She compared the data and the district's keyboarding policy and provided stakeholders with both qualitative and quantitative results that were readily retrievable for an internal assessment. She also conducted a review of related literature concerning policies on keyboarding timeliness. This portion of the evaluation was considered a review of the work process. The research of trends and policy mandates on the timeliness of keyboarding instruction in related literature provided standards for comparisons in this study. The data collection, data analysis, and data comparisons were compiled in a final report.

Demographics and Organizational Characteristics

Sixth graders who enter middle school with little or no keyboarding skills represent all demographic categories. The target school district, located in South Florida, has a very diverse community. With residents moving into the district from other states and from other countries, the demographics of the community mirror those of the nation. The researcher's middle school has a student population of 1,485 that includes 710 girls
and 775 boys. The racial composite of the school is 41% White, 32% Black, 21% Hispanic, 4% Asian, and 2% other. By grade level, there are 538 sixth graders, 493 seventh graders, and 454 eighth graders. The socioeconomics of the community are considered middle to upper class and ethnically diverse. The business community is actively involved with local schools. Parental involvement is prevalent in school organizations, and volunteers are clearly visible on campuses.

This school district is the nation's fifth largest accredited district. The student population is comprised of more than 271,000 students from kindergarten through 12th grade and is multicultural and multiethnic. The students represent 159 countries and speak 52 languages. The district has 15,000 teachers with an average experience of approximately 13 years. Administrators and staff in the school district are diverse in ethnic backgrounds. There are 136 elementary and middle schools and 27 high schools. The district funds more than $113 million in projects. The strategic plan of the district, adopted in 2000, indicated that, by 2007, all schools would have equitable resources and all operations of the school system would demonstrate best business practices while supporting student achievement.

Culture of School System and Community

Sixth graders entering middle school with little or no keyboarding skills created barriers to school culture. These barriers surfaced during the process of integrating technology into education, and, as a result, the integration of technology into core curriculum was limited. Unfortunately, it appeared that the vision of integrating and infusing technology into education might continue for a prolonged period of time.

With the challenges of embracing diversity and the expectation of quality program delivery, district educational leaders have been held accountable for attaining
improved student achievement. To accomplish the task, these leaders have had to maintain an adaptive organizational approach, to establish community and business partnerships, and to encourage collaborative efforts to achieve shared goals for education.

The recent focus on the accountability for student achievement has dramatically increased throughout the state of Florida. State-administered assessment examinations, such as the Florida Comprehensive Achievement Test, have been prioritized state-wide as the central focus of every educational agenda. Administrators, teachers at the local middle schools, and district leaders have been expending an inordinate amount of time ensuring successful results on the state assessment exams. These state assessments have caused educational leaders to place high emphasis on increasing student achievement in reading, language arts, and math skills.

With educational leaders emphasizing results of student achievement on assessment exams, the advantages of using technology in education apparently have been deemphasized. Fineout (2006) outlined newly proposed legislation in Florida that has the following requirements: "Sixth-grade students [must] take a year-long course that offers 9 weeks in art, music, physical education and career and technical education" (p. B10). From the school district to the local school campus, this scenario described the culture of the professional educational community.

Some have perceived the infusion of technology into education to be a distraction from the main goal of passing assessment exams. A concern with providing professional development for teachers in the use of technology might have had a lower priority because of the emphasis on the state's assessment examinations and limited funding. Using technology in education could benefit the school district, teachers, and students. Its use could assist students to pass the controversial Florida Comprehensive Achievement
Test. Although, recently, the school district has been nationally recognized as one of the most advanced school systems for integrating technology into education, teachers' have continued to perceive that students in the district enter sixth grade with deficient keyboarding skills.

It is the researcher's belief that the research findings on the timeliness of keyboarding instruction could possibly have a profound impact on the infusion of technology into public school education. The goal to improve achievement on the Florida Comprehensive Achievement Test might be accomplished by placing deliberate emphasis on the significance of students acquiring basic keyboarding skills and proper techniques. Ironically, if visionaries were to emerge as new strategists and if new strategies on keyboarding instruction were to be considered for implementation, a dilemma in all likelihood would occur since the imposed policy emphasis would require direct teacher keyboarding instruction.
Chapter 2: Review of Related Literature

Understanding the timely instructional policy or practice of the school district for sixth graders entering middle school with little or no keyboarding skills was the focus of the researcher's review of literature. With integrating and infusing technology into education as a national mandate for local school districts, the researcher centered the review on the importance of keyboarding, on the studies on timeliness of keyboarding instruction, and on implemented keyboarding policies of local school districts and state educational agencies. The literature review provided diverse research data related to keyboarding instruction for school children.

Delimitations

The literature review indicated an obvious ambiguity in perceptions among professionals concerning the timeliness of keyboard instruction to students. Policies that school districts have adopted for grade levels to begin teaching keyboarding have been as diverse as the perceptions of business education instructors in the target school district. A plethora of literature was found on the subject of timeliness and policies of keyboarding.

Through a study of publications, the researcher found varied perceptions concerning the grade level at which to initiate keyboarding. The researcher discovered three common themes: (a) that computers will continue to grow in importance in education, society, and the workplace; (b) that the development of keyboarding skills is essential and vital to achieving the ultimate power of the computer in education; and (c) that a broad range of opinions have caused controversy over when the skill of keyboarding should be taught to children. The model for delimiting the literature reflected both qualitative and quantitative variables in a mixed-methods evaluation process.
Variables

**Topic 1: Perceptions on timely keyboarding instruction as the independent, qualitative variable.** Robinson, Erickson, Crawford, Beaumont, and Ownby (1979) asserted, "Keyboarding is a complex skill made up of finely discriminated movement patterns that depend upon interrelated sensory, perceptual, mental, and motor inputs and outputs which must occur close together in time" (p. 1). Supporters of this thought believed that children should be taught keyboarding skills before the habitual hunt-and-peck method becomes a difficult habit to overcome. For example, Prigge and Braathen (1993) reported that students should develop their keyboarding skills before they learn to hunt-and-peck. According to Wolf (2002), "The hunt-and-peck method gives students a false sense that they 'know how to keyboard'' (p. 1). Nieman (1996) demonstrated that children with keyboarding skills compose faster, produce documents with a neater appearance, have better motivation, and demonstrate improved language arts skills. In other words, she indicated that a digital divide exists between students with keyboarding skills and students without keyboarding skills. To master keyboarding skills proficiently, students' fingers must be able to flow freely (Waner, Behymer, & McCrary, 1992).

Various keyboarding experts have suggested that keyboard learning should be taught prior to using a computer, especially since students need formal instruction to acquire keyboarding skills (Nieman, 1996; Prigge & Braathen, 1993). These experts supported the statement of Fleming (2002) who indicated that keyboarding skills should be taught as soon as the child is introduced to the computer. Children are being introduced to computers more and more and at earlier ages, as evidenced by the fact that 65% of children in 2000 had access to a home computer compared with 32% in 1993 (Newburger, 1999, 2000). Students' use of computers at school also increased from 61%
in 1993 to 71% in 1997. In 2000, gaps existed across racial and ethnic groups and family-income levels with respect to computer ownership and Internet usage (Economics and Statistics Administration, 2000). Fleming's research revealed that keyboarding skills are essential whether the need is for personal use or for a school assignment.

Toppe (1991) suggested that keyboarding skills were once primarily taught to those who were interested in increasing proficiency in order to gain employment or to facilitate preparing academic papers while pursuing a college degree. This is no longer the case. Toppe stated, "Keyboarding is an essential and enabling skill for all students and all workers" (p. 22). Bartholome (1996) reported that the Policies Commission for Business and Economic Education indicated that students should be introduced to keyboarding in the elementary grades. According to Wronkovich (1998), fifth- and sixth-grade students possess the finger coordination needed to effectively use the touch method of typing. Robinson (1992) believed that children should learn to keyboard when they have a need to communicate.

A longitudinal study conducted by Rogers, Laehn, Lang, O'Leary, and Sommers (2003) concluded, "Third grade received the most responses in 2003 regarding when the formal introduction of the touch method of keyboarding was introduced, compared to fourth grade in 1996 and 1993" (p. 1). Gilberstad (2002) found that the teachers' perceptions of keyboarding skills are that the skills that are demonstrated by students entering Grade 5 range from none to excellent. The recommendation of Erthal (1998) that keyboarding instruction should begin after fifth grade was confirmed by the study of teachers' perceptions conducted by Gilberstad. This portion of the literature review reinforced the researcher's study of the perceptions of middle school business teachers in the target school district regarding the keyboarding competency skills of sixth graders.
Topic 2: Policy on timely keyboarding instruction as the dependent, quantitative variable. Jennings (2001) concluded that there are no national standards for teaching keyboarding. Despite the fact that keyboarding is a skill that benefits every student who graduates from high school, the writers of related literature revealed that only a few states require a keyboarding course at either the middle school or the high school. The most disturbing findings revealed that, in some states, keyboarding courses do not count as even an elective for fulfilling the requirements of the core curriculum.

It appeared that, from a practical standpoint, the efforts of the target school district to infuse technology into education would require lawmakers and administrative school personnel to locate additional funding by seeking the assistance of stakeholders such as public officials, parents, and corporate business leaders. With concerns regarding national school reform, educational leaders would have to address both students' needs and the needs of the global economy. If students were expected to withstand and to survive the competitive edges of global challenges, educational administrators would have to provide a quality education to all students from kindergarten through 12th grade to enhance each one's ability to access computer and technology skills and training.

This applied dissertation study was conducted after No Child Left Behind Act (2001) was introduced and has had significant impact on the direction of the use of educational technology in the learning environment. Leadership is the single most important factor affecting the successful integration of technology into the curriculum. It is interesting to note that, although this federal act was initially implemented nationally to impose an increase in technology into education, the federal government has continued to demand that no child should be left behind without providing significant funding.

Erthal (1998) pointed out that the states that have mandated the teaching of
keyboarding prior to the sixth grade include Georgia, Texas, Minnesota, New York, and Virginia. These states have mandated keyboarding classes beginning in the fifth grade, the amount of instructional time spent on keyboarding, and the specified standards for speed and accuracy. This instructional approach to keyboarding has prepared young students with measured skills to use the computer. Erthal advised that those who concurred with this thinking should urge school districts to consider their accountability for teaching keyboarding to elementary students.

Toppe (1991) aptly stated, "Keyboarding, no longer a skill reserved for secretaries, must be formally taught to and learned by all students" (p. 23). Olinzock (1998) confirmed Toppe's statement:

One need only walk into any classroom, home, or business to see the many impeded by the lack of keyboarding skills and the many others hampered by bad habits and improper technique developed over years of using the keyboard improperly. (p. 24)

Erthal (1998) suggested that children below the third grade typically "do not possess the dexterity and hand size to manipulate the keys effectively" (p. 37). She believed that students do not possess the necessary skills to keyboard at that age. Starr (2001) found that students in the third grade could learn to keyboard. Feutz (2001) reported that first graders and second graders are able to keyboard. MacIntyre (1990) concluded that formal keyboarding should not begin until fifth and sixth grade.

Rowe, program specialist for business and information technology at the Virginia Department of Education (as cited in Gruss, 2003) stated that, for 10 years, middle school educators have been encouraged to offer keyboarding classes. With such a policy in place, students should have benefited from the use of computers as they progressed in education. The study recommended that educators in elementary, middle, and high
schools use a cross-curriculum approach to developing student keyboarding skills.

Gruss (2003) pointed out that, although in Virginia keyboarding instruction in middle school is emphasized and even mandated for 5th graders, many students in Grades 9 through 12 must learn or refresh their skills because they have not been equipped with the keyboarding skills required to use advanced computer applications in high school. The prompt development of proper keyboarding techniques is extremely important for ensuring future efficiency and productivity (Wiggs, 1993).

Erthal (1998) commented that the best programs involve a partnership between elementary and business education instructors. Because of new technology and changes in the workplace environment (VanHuss, 1997), it is imperative that educators update curriculum and text materials accordingly. VanHuss contended that curriculum and text materials must meet a broad spectrum of needs within and across schools. He supported an integrated approach to prepare students for the workforce.

No one can question the importance of keyboarding in one's private and professional life (Highland, 1997). Indeed, people who lack keyboarding efficiencies are at a disadvantage. Olinzock (1998) stated, "Computers have made keyboarding a basic lifelong skill, keyboarding has nevertheless often been dropped from the curriculum at all levels, from elementary school to the university level" (p. 24). According to Olinzock, the several reasons have been given for removing keyboarding from the curriculum: keyboarding (a) is a simple skill that requires no instruction or learning, (b) is a basic skill not worthy of credit, (c) will soon become obsolete as an input skill, and (d) is a skill with no research or pedagogical base.

Keyboarding is a psychomotor skill that requires proper teaching by a qualified
instructor who is knowledgeable of research findings and appropriate methods of teaching (Olinzock, 1998). According to Robinson et al. (1979), several experts have agreed that the effective teaching of keyboarding requires that the instructor (a) be knowledgeable of the learning process, (b) possess skills in arranging the conditions of learning, and (c) exhibit skills in the process of interacting with students and manipulating human characteristics to achieve worthwhile ends.

In order to provide students with keyboarding skills, the five components of a keyboarding program must function together: the learner, the teacher(s), the curriculum, the resources, and the administration (Hoggatt, 1998). During the initial literature review, the researcher believed that the learning community should be a sixth component of a successful keyboarding program. Parents and community and business members, who are a part of the learning community, can assist students with acquiring the essential technical skills of keyboarding.

Schade (1999) found that some schools have no one teaching keyboarding, whereas other schools allow anyone to teach the skill. Yet, this skill has never been more vital to success in the workplace. Business educators must recognize keyboarding as a critical component of employment success, reclaim ownership of this discipline, and teach it with passion and precision. Schade commented that keyboarding requires the expertise of a certified business teacher.

Skean (1999) indicated that many students in keyboarding classes have little or incorrect keyboarding skills; however, he believed that skill development should receive major emphasis in a keyboarding class. Skean concluded, "The business education professional is faced with the task of carefully evaluating the uses of the computer keyboard and in determining the most appropriate methods for teaching the entire
keyboard, not just the traditional typewriter section" (p. 38).

Some experts in the related literature believed that, in the near future, speech recognition will replace keyboarding. The development of speech recognition software is part of the rapid advancements in computer technology. Today, speech recognition is being taught in some schools in the nation. Reading, enunciating, and voice writing at 110 to 160 words per minute are the new essential skills according to some research. Barksdale (2002) reported that, even though voice recognition (also known as speech recognition) technology is being used by hundreds of thousands of people, it does not eliminate the need for people to be able to efficiently use the keyboard. In the judgment of this researcher, until speech recognition is integrated throughout society, keyboarding will remain a necessary skill needed by all students.

**Topic 3: Triangulation of qualitative and quantitative variables as the independent relationship between variables.** Increasingly, in the late 20th century and early 21st century, students have entered middle and secondary schools having little or no formal keyboarding instruction. Because teachers continue to cite the inadequacy of keyboarding skills for students at Grades 6 and 7, school leaders should give serious consideration to mandating an elementary keyboarding curriculum (Gilberstad, 2002). The target district provided introduction for keyboarding courses for students in the sixth grade.

Hoggatt (1998) contended, "Keyboarding is a basic literacy skill" (p. 35). Keyboarding is an important foundation block around which other academic skills are built (Wolf, 2002). Davidson and Kochmann (1996) emphasized that, if correct techniques are taught with initial computer use and progressively reinforced each year, the level of keyboarding ability is continually strengthened. A continuous development
plan of keyboarding skills needs to be in place to assure success after initial keyboarding instruction (Sormunen, 1991).

Those following these beliefs urge school district administrators to consider their accountability in including keyboarding instruction for elementary students. Researchers have shown that poorly developed techniques severely limit individual achievement and impede future accuracy in keyboarding (Erthal, 1998; Hoggart, 1998; Olinzock, 1998). In the opinion of the researcher, proper technique is the first skill to be developed in keyboarding instruction. Further, proper technique must be adequately introduced and monitored on an ongoing basis by highly qualified business education teachers. The attainment of speed could become extremely difficult for students to acquire without the command of proper keyboarding techniques. Finally, bad habits attained through the use of improper keyboarding techniques prove difficult and, in many instances, impossible to correct.

Zamudio (2006) determined that, when students are taught appropriate keyboarding skills, they become more productive and proficient with the keyboard and their ability to learn other computer-based technologies is enhanced. Business professionals who have keyboarding skills believe that these skills make them more productive. Further, business professionals without keyboarding skills believe their productivity would substantially increase if they acquired keyboarding skills (Wiggs, 1993).

With a number of states mandating keyboarding instruction at the elementary level, districts need to become responsible for teaching the complex psychomotor skill to students. Depending on a district's standards and benchmarks for keyboarding, the leaders of each school must review related literature to make an informed choice for the district
Hoggatt (1998) asserted, "Keyboarding programs must embrace the opportunity to change as well. Successful keyboarding instructors take charge of change (and their future) by planning--they create a master plan for the keyboarding program" (p. 34). Further, he explained that a successful keyboarding program provides students with the skills and the knowledge needed to function effectively in today's business environment and in a complex and rapidly changing technological world.

The researcher reviewed the literature for a mixed-methods evaluation approach to investigate the perceptions of middle school business teachers in the target school district on the timeliness of keyboarding skills. The researcher found that the TQM method fit well with an internal organizational investigation and a mixed-methods evaluation approach. The TQM evaluation method is primarily used by the corporate world. Defining customers in the public setting becomes a little more difficult (Fitzpatrick et al., 2004). For the purpose of this study, the researcher defined customers as the district's policy for implementing of timely keyboarding instruction. TQM provided the researcher with a method for triangulating the analysis of qualitative data (perceptions on keyboarding timeliness) and quantitative data (identified keyboarding policies) to measure the target school district's implementation of a timely keyboarding policy. The TQM method was used to study the efficiency and the production levels of the district's mandates on the timeliness of keyboarding instruction.

This study was an internal evaluation conducted by the researcher for the purpose of establishing suggestions for organizational efficiency and increased productivity. After the analysis of the detailed data collected, the production of the final report, and the review by the local school principals and district leaders, the researcher hypothesized that changes would be needed in the design of the target school district's existing policy.
relative to the timely introduction of keyboarding instruction. Further, the researcher believed that the organizational culture pertaining to keyboarding instruction would be altered. The most specific change anticipated by the researcher was that keyboarding instruction would become a mandated part of core curriculums in schools prior to Grade 6. The infusion of technology into education was a critical imperative. It was the expectation of the researcher that, in a school district rated as a national leader for integrating technology into education, changes would be implemented that would effectively incorporate technology into every classroom in kindergarten through 12th grade.
Chapter 3: Research Methodology

Overview of Methods

The internal investigation of the target school district's policy on the timeliness of keyboarding required an evaluation method designed for the purposes of improved organizational efficiency and increased productivity. Several evaluative methods were reviewed. After a thorough analysis, the researcher selected the TQM approach as the evaluation method to be explored and used for this applied dissertation study.

TQM involves a review of internal organizations and uses elements of input, process, and output functions with a focus on service. Fitzpatrick et al. (2004) explained the TQM methodology as follows:

These are the components TQM examines or studies, but TQM has two critical characteristics that link it to evaluation today. First, being a statistician, Deming (1986) urged that these components be studied through systematic collection of data. Data, through interviews, monitoring, or existing information, are collected to examine current operations or problem areas. Results of this data-collection process are reviewed and new systems are proposed. These systems are then pilot-tested and new information is collected. Processes are revised or replaced, based on these pilot tests. TQM envisions the organization in a constant process of testing and examination. Employees are asked to question standard operating procedures (SOPs) and to change continually to achieve quality. . . . Second, TQM is not conducted by methodological experts, though they can serve as facilitators, but by worker teams. This attribute is critical to the success of TQM. Deming (1986) believed the workers closest to the job knew the most about the work process and, hence, were in the best place to identify problems and recommend improvements. TQM gives those workers the opportunity to question processes and make changes while encouraging them to define their goals in relation to quality products and customer needs. (p. 499)

Fitzpatrick et al. (2004) stated, "The TQM approach of organizational analysis examines the supplier, work process and customer satisfaction" (p. 498). TQM provided the researcher with a research process that incorporated both validity and reliability. It was the researcher's belief that the selected TQM approach would be the most effective evaluation method for this applied dissertation study in its investigation of the timeliness
of keyboarding instruction within the target school district.

For the purpose of this research, the suppliers were middle school business instructors who taught keyboarding skills. The work processes included reviewing the policy of the public schools in the target school district and related literature to learn about the timeliness of keyboarding instruction. Customer satisfaction was the district's implementation of its timely keyboarding instructional policy that was designed to maximize the use of computers in education.

For this research, middle school business instructors were selected as the suppliers of keyboarding instruction because of their direct contact with students. It was the researcher's opinion that business teachers who gave instruction on keyboarding were in the best position (a) to assess and to evaluate their students' skills or lack of skills and the level of students' keyboarding competencies and (b) to confirm the policies and practices of the target school district with respect to timely keyboarding instruction.

The validity of the input from the business teachers was measured by each one's teaching experience and the number of years in teaching keyboarding in the classroom. The majority of the middle school business teachers had a minimum of 5 years of experience in each category. These combined experiences provided the study with a basis for determining the quality of respondents selected as prospective suppliers. The internal organizational standard used for the customer in the TQM model for this dissertation was the target school district's policy that was implemented through its District Technology Plan for 2002-2007. From this plan, the researcher elected to reference the Curriculum and Technology Integration Milestone policy for use in this study. Specifically, the research focused on the technology competency milestone that required that students would achieve competency in beginning skill levels in word processing by fifth grade.
This milestone represented the customer for the TQM approach.

The target school district's progress, effectiveness, or the possibility of any ineffectiveness related to the implementation of its own policy on the timeliness of keyboarding instruction were both qualitatively and quantitatively measured by the researcher. Measuring the district's implementation of the timely keyboarding milestone caused the researcher to measure the perceptions of business instructors to determine the levels of their customer satisfaction. The significance of these measurements allowed the researcher to review the district's implementation efficiency pattern for its policy of initiating timely keyboarding instruction.

The review of literature on the timeliness of keyboarding instruction along with a review of the target school district's policies (the work processes) provided the researcher with a diverse overview of keyboarding curriculums and practices. With evidence of the existence of the district's keyboard policy, the researcher concentrated on a thorough review of literature to explore trends in national technology standards for keyboarding that emphasized documented successes on the timeliness of keyboarding instruction. It was the researcher's belief that the comparatively analyzed data retrieved through use of TQM and triangulated, mixed-methods approaches would establish whether or not the implementation of district's policy on the timeliness of keyboarding instruction required increased productivity.

The researcher's reason for selecting triangulation mixed-methods design was that it would increase construct validity in the study. Brinkerhoff (as cited in Fitzpatrick et al., 2004) suggested that instilling evaluative thinking into an organization would help the organization to deliver a better product. Fitzpatrick et al. noted that quality control and quality assurance focus chiefly on process. The TQM approach has provisions that
allowed the researcher to collect data from several sources by using both qualitative and quantitative methods. Extensive use was made of interviews, customer-satisfaction surveys, checklists for monitoring purposes, and other TQM evaluative measures throughout the research process. The researcher had accumulated nearly 30 years of personal observations in business education classrooms and was highly qualified to engage in internal research. From the results of the applied dissertation study, the researcher was to provide feedback for the improvement of the target school district's vision of its future direction for continued infusion of technology in local schools.

Methodology Phases

**Phase 1, Objective 1: Establishing the target group.** The researcher established a target group comprised of middle school business teachers who were responsible for keyboarding instruction. According to the district's alphabetical list of schools and centers for 2005-2006, the district had a total of 41 middle schools. Following protocol, a research approval packet and letter was sent to all middle school principals in the district to request approval to conduct the applied dissertation research study with the business teachers at their respective site locations. Principals who offered a keyboarding curriculum at their school site and who gave approval for the research were identified as sources for selecting the target group participants. These steps provided the catalyst required for initiating the retrieval of (a) quantitative data from assessments of students in Grades 6 through 8 who had been in keyboarding classes and (b) qualitative data related to the target school district's policy on the timeliness of keyboarding instruction.

**Phase 1, Objective 2: Obtaining approval of target group members.** The researcher contacted the business teacher(s) at each school after receipt of the principals' approval. The second contact by the researcher was made to obtain the approval of the
individual teachers to participate in the study. She contacted them via telephone, interoffice memo, and e-mail. The researcher explained to the participants their expected role in the study and the low risk involved in their participation. The participants were aware that their involvement in this study was solely on a volunteer basis and that they could decline to participate at any time. All of the teachers who initially agreed to participate in the study remained involved throughout the research project. In an effort to protect the confidentiality of information provided, an anonymous colleague of the researcher assigned a numeric code to each member of the target group. The researcher guaranteed the anonymity of the subjects for participation in the study.

*Phase 2, Objective 1: Gathering quantitative data.* The researcher created a system of three surveys. From the responses to the instruments, the researcher could analyze and numerically measure the perceptions of middle school business teachers of their students' keyboarding performance skills, related timely keyboarding topics, and the target school district's policy on timely instruction of keyboarding. The participants represented 24 of the 27 middle school keyboarding instructors in the target school district. The high percentage of keyboarding instructors who participated in the study provided the study with a real-time view of the implementation of the district's policy on the timeliness of keyboarding. Instead of conducting the study with a convenience sample of the instructional population, the researcher conducted it with a nonrandom population. The researcher believed that this target group of participants, treated as a single unit, would prove more beneficial and significant to the district than a sampling or stratification of the district's entire teaching population. Descriptive statistics were used to analyze data from this target group, and frequencies and percentages were used to interpret the responses.
Specifically, the survey instruments developed for this research included three types: the Keyboarding Education Survey, Respondents' Interview Survey, and the Teachers' Telephone Interview Questions (see Appendix A, B, C, respectively). The researcher developed these instruments in an effort to collect, evaluate, and analyze data for the study; they were only used during the research period. The Keyboarding Education Survey and the Respondents' Interview Survey were self-administered. The researcher conducted the Teachers' Telephone Interview Questions with each individual participant in the study.

The use of multiple surveys allowed the researcher to form questions designed to provide answers in full context and would allow her to collect and analyze required data on the implementation of timely keyboarding instruction. Further, the multiple surveys enabled the researcher to present core topics in triangulated variations. This variety of approaches on core topics for content purposes involved different types of triangulated measuring scales. The scale used in the Keyboarding Education Survey was the 5-point Likert-type scale with the following ratings: strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree.

With the exact content and the same variables listed, the researcher asked each respondent on the Keyboarding Education Survey, At what grade level do you think formal keyboarding instruction should be introduced to students? In responding to this content question, respondents were asked to choose only one level. The responses to this question were measured on a categorical scale. To cross-reference the answers to these questions in an effort to identify bias, if any, the researcher conducted telephone interviews with each participant. Respondents were asked, How important is it for students to learn keyboarding by sixth grade? With the response to this open-ended
question, the researcher used the measurement of frequency distribution as it related to the actual occurrences described in the telephone interview discussions, or consideration was given to intuitive reasoning in a subjective effort to confirm individual responses of each participant.

The researcher developed the Keyboarding Education Survey (see Appendix A) that included 10 questions. The content topics of these questions were in such areas as keyboarding courses as electives or required core curriculum, the grade when initial keyboarding instruction is introduced, and the identity of the district's policy on timely keyboarding instruction.

The researcher developed the Respondents' Interview Survey (see Appendix B), that included 14 items. Some of the items were qualitative in nature and established the teaching experiences of the participants, the number of classes taught daily, and the perceived proficiencies of students. Some of the items were quantitative in nature and established the average number of students per class, length of keyboarding classes, and other related numeric data.

The Teachers' Telephone Interview Questions (see Appendix C) included 7 open-ended questions developed to encourage each participant to share thoughts, insights, statements, feelings, and recommendations on the timeliness of keyboarding instruction. Topic frequencies were noted during the interviews and were used statistically to confirm the recorded survey responses of each participant (see Appendix D). Bernhardt (2000) found that perception data were useful for evaluative research:

Perceptions data help us understand what students, parents, teachers, and others think about the learning environment. Perceptions are important since people act based on what they believe. It is important to know how students, teachers and parents think about school, what relations have been like in the past and what expectations they have for the future. Perception data can be gathered in a variety
of ways, such as questionnaires, interviews, and observations. (p. 1)

During the telephone interviews, the researcher recorded conversations to ensure the accuracy of data that were collected and analyzed (see chapters 4 and 5). The instructors provided invaluable insight into their experiences in training their sixth graders who had no keyboarding skills in a society where technology is being integrated in every aspect of literacy. Identifying teachers' perceptions was extremely important because the participating teachers were on the frontline providing and developing keyboarding opportunities to teach students (a) to use technology in the workplace, (b) to access global information, and (c) to enhance knowledge and skills related to technology use in education. It was imperative for the students to become proficient in keyboarding prior to sixth grade.

As expected, the researcher found that the designed surveys and interviews revealed that the teachers' expertise and perceptions would be beneficial to the target school district. The reported data were designed to reveal the district's existing technology competency mandates in comparison with the teachers' perceptions of the timeliest grade level for initiating formal keyboarding instruction to students. As a result of the data collected, the researcher would discover whether or not the district's mandates would need to be revised. The researcher sought both quantitative data through the surveys and qualitative data through the interviews to make inferences concerning the timeliness of keyboarding in the district. The efforts by the researcher to cross-reference the responses by the participants provided the study with reliable sources of data that were collected by using triangulated and mixed-methods approaches. The results of the Keyboarding Education Survey are found in Appendix E.

All forms of data were retrieved, analyzed, and discussed to determine teachers'
perceptions of students' keyboarding skills and the grade level at which keyboarding skills were perceived to be most effectively introduced. Each participant responded to a Keyboarding Education Survey that included 10 questions, a Respondents' Interview Survey that included 14 questions, and Teachers' Telephone Interview Questions that included 7 questions. Each of the 24 participants answered all 31 survey questions. Upon completion of the written surveys, the participants returned them to the researcher through the district's interdepartmental mail service.

**Phase 2, Objective 2: Gathering qualitative data.** The survey questionnaires consisted of both closed-ended and open-ended questions. The Keyboarding Education Survey, the Respondents' Interview Survey, and the Teachers' Telephone Interview Questions were designed with questions that allowed the researcher to conduct in-depth personal interviews with each participant (see Appendixes A, B, and C, respectively). The Teachers' Telephone Interview Questions were designed to provide statistical data from (a) respondents' identity of the readiness of their students to learn keyboarding skills, (b) their personal views on related keyboarding subjects, and (c) their opinions on the district's keyboarding policy. The responses to open-ended and closed-ended interview questions were analyzed by organizing the data into qualitative and quantitative categories relevant to the study (see Appendix D). The researcher developed a narrative summary of the results of the teachers' telephone interviews (see Appendix F). The researcher extrapolated qualitative data that (a) gave explicit teachers' perceptions concerning students' acquisition of keyboarding skills prior to entering sixth grade and (b) were pertinent to improved organizational efficiency and increased productivity in the target school district.

The researcher was persistent in acquiring data from each of the identified schools
and contacted participants to schedule personal interviews. Each participant contacted the researcher through e-mail, telephone, or written correspondence with a date and time convenient for the interviewee. In consideration of the participants' time and responsibilities and in an effort to expedite the data-collection process, the researcher conducted interviews over the telephone with each participant. The teachers were not given the interview questions ahead of the scheduled appointment because the researcher believed that this would provide spontaneous responses from the participants and an accurate revelation of the perceptions of each participant in relation to all questions asked. The interviews conducted between the researcher and the participants averaged 30 minutes in length.

During the interviews, the researcher created a communication environment that fostered a low-key, informal conversational exchange. The researcher used a confirmatory approach during the interview to obtain accurate recordings of each teacher's comments. Participants were asked to repeat statements as needed. This procedure allowed the keyboarding instructors accurately to relate (and the interviewer to record) their classroom observances related to individual students' keyboarding abilities. This approach necessitated detailed and constant note taking.

The researcher used individual participants' frequency of responses to determine common themes and patterns concerning the timeliness of keyboarding. Examples of these common themes included required keyboarding courses, keyboarding instruction for elementary grades, sixth graders with no keyboarding skills, promotion of keyboarding skill development, and barriers to timely keyboarding instruction.

Phase 2, Objective 3: Collection of data. The researcher undertook an extensive review of related literature that referenced the timeliness of keyboarding instruction.
Additional literature was reviewed to enhance the researcher's further understanding of the varied opinions and perceptions of published keyboarding experts in the field. Trends and relevant standards were explored in the literature to assess the depth of recorded perceptions that suggested when a child is ready to begin to keyboard. Research into perceivable benchmarks, such as the grade when keyboarding instruction should begin in schools, was essential. Moreover, the writers of the related literature described, identified, and determined the perceived best strategies that could be developed and that would empower students to become successful in a technologically global society (see chapter 2).

*Phase 3: Data analysis.* The data were collected and analyzed during a 5-month period from August 2005 through December 2005. All surveys were completed by all of the respondents and returned, and all interviews were conducted during this period. The researcher analyzed the recorded data using a software data analysis program (Levesque & SPSS, 2006). Frequency counts and percentages were used to organize, analyze, and summarize the data collected. A surplus of descriptive statistics was retrieved and tabulated by the researcher during the software data analysis. Computations for frequency distributions and relevant percentages were used to interpret the analyzed results.

*Researcher's Role*

The researcher's role in the applied dissertation study involved (a) reviewing related literature, (b) selecting appropriate evaluative methods and procedures required to be able to properly collect and interpret data, (c) adequately reporting analytical results, and (d) clearly and succinctly discussing the in-depth implications of the results. More important, teaching keyboarding in the target school district's middle school for over 25 years has provided the researcher with an internal and personal view of the target school
district's policy on timely keyboarding. As a result of this experience, the researcher perceived that the school district's implementation efforts to provide timely keyboarding instruction lacked maximization.

Keyboarding skills have proven to be an essential component to ensure increased student achievement in education and in preparation for computer literacy in a technologically advanced workplace. The researcher was an advocate for the increased use of computers and integration of technology in education within the target school district and was an active participant on committees for the infusion of technology into the classroom. This advocacy included collaborating with the Technology Committee of the School Improvement Team and serving as chair of the Unified Arts Department. These leadership activities provided the researcher with opportunities for inclusive participation in planning computer usage and the direct involvement in the implementation process of integrating technology in education. The researcher, who is considered to be a middle school keyboarding expert, conducted this study to benefit the target school district in its policy of timely integration of computers into the classroom.

The researcher observed the frustration of middle school teachers because sixth graders lacked keyboarding proficiency and because their lack of keyboarding competencies made it impossible for teachers to introduce them to computer applications required in sixth-grade curriculum. From these observations the researcher assumed that too many students were entering middle schools with little or no keyboarding skills for the timely infusion of computers and technology into education by the target school district. This assumption became the basis for this dissertation. The researcher anticipated that this research would provide support for the development of a clearly defined vision for the empowerment of the target school district's future direction. The infusion of
The researcher believed that any consideration that the target school district could give to the initiation of keyboarding in kindergarten through Grade 5 would certainly give middle school business education teachers an opportunity to expose students in Grades 6 through 8 to more advanced levels of keyboarding instruction and computer applications in order to enhance each student's skills capacity. Implementation of a new and revised keyboarding applications program would afford the district an opportunity to be on the cutting edge in the infusion of technology into education. The district, through self-examination, could fulfill the intent of its technology competency milestone that is required to qualify its students in word processing proficiency by the end of Grade 5.

Implementation Design: Action Plan

The TQM approach used in this study required the researcher to perform initial data collection that included surveys, interviews, and a thorough review of related literature. The researcher was prepared to determine the target school district's policy and practice on the timeliness of basic keyboarding instruction. The researcher was persistent in acquiring the data from each of the identified schools. This persistence paid off in that all responses were received and tabulated from each school. Measuring teachers' perceptions and awareness of existing district-wide policy and practice on the timeliness of basic keyboarding instruction required the design of triangulated evaluation methods using both quantitative and qualitative data.

The TQM mixed-method approach of comparative analysis and the triangulation method required verification of all data findings. The data were extrapolated and tabulated in entirety to determine the timeliness of keyboarding instruction as perceived by middle school business education instructors who taught keyboarding techniques. The
researcher triangulated the quantitative data from Likert-type questions and tabulated qualitative responses that were gathered by means of open-ended questions. The researcher anticipated receiving at least a 90% response from the participating target group.

**Evaluation and Questions**

The researcher assumed that 90% to 95% of students in Grade 6 were entering middle school with no keyboarding skills. Data collected and analyzed confirmed this assumption. Then, the researcher raised another question on how the performance of the target school district's policy on the timeliness of keyboarding instruction could be affected in comparison to the anticipated data analysis. The researcher focused on middle school business teachers and their perceptions of students' proficiency in keyboarding. This question caused a district-wide investigation, and research implications were explored to determine teachers' perceptions on students' competencies in keyboarding skills and teachers' perceptions related to the District Technology Plan for 2002-2007, that contained a technology competency milestone that emphasized that fifth graders would master skills of basic word processing.

The combination of students with timely keyboarding skills (customer satisfaction), the middle school business teachers (suppliers), and target school district's policy and the review of literature (work processes) were the required elements for the design of the TQM methodological approach. The TQM method was used to investigate the perceptions of middle school instructors in conducting this internal organizational analysis. This evaluation method significantly measured the data required to respond to the question that prompted the researcher to initiate this study.

The researcher's initial research question was expanded to survey the timeliness of
keyboarding instruction as perceived by middle school business teachers in an urban school district. All business teachers answered the same questionnaires. The research instruments were carefully designed to generate ideas that were extrapolated from the response data obtained from the participating teachers. The instructors reported their perceptions of their entering sixth graders' keyboarding abilities. McKinnon and Nolan (1990) stated, "The early mastery of the keyboard will help make the computer as transparent as pencil and paper in achieving educational goals, thus helping students and teachers realise the real power of the computer as an educational tool" (p. 2). If students do well in a sixth grade introductory keyboarding course (dependent variable), that may be due to (a) their early introduction to keyboarding (independent variable) or (b) their exposure to keyboarding in preceding academic years (intervening variable) that influenced their keyboarding competency and skill level.

In the past 20 years, educational policymakers have yet to emphasize and prioritize the importance of teaching keyboarding. The target school district has had a policy on the timeliness of keyboarding instruction since 2002 but it has not been effectively enforced. In other words, educators have not been able to use effectively the computer as an educational tool because 90% of students enter the sixth grade with no keyboarding skills. By researching the timeliness of keyboarding in the target school district, the researcher believed that the paradigm could shift toward a unified curriculum and the provision of district-wide quality keyboarding instruction. The district would be provided an opportunity through this research to initiate efforts to use innovative methods to improve the teaching and technology learning environment.

The researcher found that students with keyboarding skills could readily develop an increased use of technologies for the production of higher achievement. Further, as a
result of the initial informal perceptions and experiences of the business teachers, the researcher designed this investigative study. The researcher attempted to answer specific research questions that would be necessary to determine the target school district's policy on the timeliness of keyboarding instruction. A mixed-methods approach to the data analysis was selected as a result of the triangulated designed survey and interview questions. The participants' responses provided both quantitative and qualitative data to answer the research questions.

Methods Used to Measure Research Questions

The purpose of this applied dissertation was to measure the teachers' perceptions of the timeliness of keyboarding instruction in the district as well as the effectiveness of the district's keyboarding policy. Five research questions were developed as a foundation for the applied dissertation research study concerning teachers' perceptions and the effectiveness of the district's keyboarding policy. This researcher recorded and measured the input, intuitive response, and subjective perceptions of the target group of participants during the data gathering and evaluation process. The qualitative and quantitative data were used to respond to each of the research questions.

Research Question 1 asked, What are the percentages of sixth graders entering middle school with little or no keyboarding skills in the local schools and district? This question was developed to establish a means of collecting data to measure the perceptions of business teachers on keyboarding competencies of sixth graders. Depending upon the magnitude of the retrievable data, the probability might exist to indicate low keyboarding competencies of sixth graders. Quantitative measures were determined by the responses to this question that provided the researcher with the following measurable perceptions: perceived timeliest grade level for initiating keyboarding instruction and total number of
teachers who perceived a high percentage of entering sixth graders with no keyboarding skills. Qualitative data measured perceived recommendations of teachers and provided responsive data related to the timeliest grade for initial keyboarding instruction to begin and for instructors' perceptions on promoting awareness and the availability of keyboarding classes to students.

Research Question 2 asked, What are the perceptions of local middle school business teachers on the timeliness of keyboarding instruction? This question measured perceptions, recorded opinions, and ideas of middle school business teachers on the timeliness of keyboarding instruction to children. Quantitative data measured (a) the suggested grade levels for initial keyboarding instruction that were considered to be best for effective instruction, (b) the total number of teachers who administered a keyboarding pretest, and (c) the number of teachers who believed students should be required to take keyboarding instruction. By use of qualitative data, the researcher assessed barriers to mandatory keyboarding classes, the importance of keyboarding instruction by the sixth grade, and offerings of keyboarding curriculums in the district.

Research Question 3 asked, How do the perceptions of the timely policy for teaching keyboarding to students by middle school teachers compare with the local district's policy on timeliness? First, the researcher measured the effectiveness of the implementation of the target school district's existing policy. Second, the researcher performed a comparative analysis of the district's policy and the perceptions of middle school business teachers. Quantitative data measured the number of teachers who were aware or unaware of the district's timely policy on keyboarding; the number of teachers who selected specific grades for initial keyboarding instruction; and the grade level that teachers perceived that keyboarding should be introduced. Qualitative data included
recommendations that indicated instructors' perceptions for the timeliest grade for initial keyboarding and teachers' perceptions of the district's policy on timely keyboarding instruction.

Research Question 4 asked, When literature is researched on the timeliness of keyboarding instruction to children, will there be a recommendation? A thorough and careful review of related literature was conducted. The researcher explored and collected data that revealed expert responses from publications by professionals in the controversial and obviously expanding field of keyboarding instruction. The findings of the writers of the literature assisted her in establishing a basis for comparisons for this study. She used data from quantitative measures to analyze grades for initial keyboarding instruction, to consider mandatory keyboarding instruction, to compare keyboarding core curriculum and elective curriculum, to compare the district's keyboarding policy to established standards cited in the literature review, and to develop recommendations for the timeliest grade for initial keyboarding instruction. Qualitative data measured the teachers' perceptions regarding keyboarding as a mandatory core curriculum requirement and compared teachers' recommendations on the timeliness of keyboarding instruction with those varied responses found in the review of literature.

Research Question 5 asked, How do the perceptions of business teachers compare with those of the writers of the reviewed literature regarding the timeliness of keyboarding instruction of children? The perceptions of business teachers (suppliers) were compared with findings and perceptions of the writers of the reviewed literature (the process) on identified elements and standards to measure the impact on implementation and perceived quality control of the organizational efficiency. Quantitative data were used to measure teachers' thoughts on the initial grade for keyboarding instruction to be
taught, the number of teachers who thought keyboarding should be taught to students, the
total number of teachers who believed keyboarding was important in the future, the total
number of teachers aware of alternative technology input devices, and the total number of
teachers certified to teach alternative technologies, if any. Qualitative data were used to
compare recommendations to promote students’ awareness of keyboarding skills, to
identify barriers to incorporating mandatory keyboarding classes into the core
curriculum, and to provide future recommendations for further research.

The researcher anticipated that middle school business education teachers in the
district would have different views on the timely introduction of keyboarding instruction
and that the teachers’ perceptions of the timeliness of keyboarding instruction compared
to the district’s policy and the implementation of the policy would disclose discrepancies.
More importantly, the researcher believed that the perceptions of a minimum of 60% of
middle school business teachers surveyed would be that approximately 90% to 95% of
the entering sixth graders had little to no keyboarding skills. When keyboarding
competencies skills were not met in earlier grades, the students entered Grade 6 without
the necessary skills to learn computer applications.
Chapter 4: Results

The researcher of this applied dissertation study asked the following general question: Is middle school the appropriate grade level for basic keyboarding instruction to begin? The TQM method of internal organizational analysis was used for its relevancy for developing ongoing methods for deciding the timeliness of keyboarding instruction prior to sixth grade. Specific findings and identified implications were revealed through a complete data analysis of instructors' responses to the survey and interview instruments. The qualitative and quantitative data were retrieved and compared with other pertinent data collected, and the studies of writers of related literature were explored in order to formulate conclusions and recommendations on the timeliness of keyboarding.

The mixed-methods approach was used for a comparative data analysis that were produced from the results derived from a triangulated methods approach. The latter was employed as a means to provide some insights into teachers' awareness of the district's policy on keyboarding. Perhaps the most important message from this study involved issue of a district policy that required proficiency in word processing by fifth graders and the discrepancy revealed by both the qualitative and quantitative data, indicating that students entered sixth grade with little or no keyboarding skills.

Moreover, it was essential for school administrators to realize that involving its business education teachers in the target school district's plans for the infusion of technology into education was essential for teachers to fully realize their total worth. The district needed to ensure that it communicated clearly that teachers' expertise, time, and efforts are valued and necessary for the proficient development of keyboarding competencies in all students from kindergarten through Grade 12.
District's Middle School Keyboarding Course Offerings

A research approval packet, survey instruments, and a letter were sent to 41 middle school principals. Several follow-up calls were made by the researcher to principals of middle schools that were identified by the district. The validity design of the methodology of the applied dissertation study required participation of middle school business instructors who taught keyboarding. Using the design criteria, the researcher found that 27 middle schools in the target school district offered keyboarding instruction as an elective or as part of the core curriculum. All 27 principals at each of the schools that met the criteria gave their approval to the researcher for the study. For the purpose of this dissertation, the sample population was 65.8% of middle schools in the district.

The middle school sample population provided the researcher with a potential target group of 27 keyboarding teachers. Three middle school instructors declined to participate in the study. The researcher investigated the timeliness of keyboarding with 88.8% of all the middle school business teachers in the district. The Keyboarding Education Survey (see Appendix A) had statements regarding such topics as the timeliness of keyboarding instruction and the subject being an elective or an integral part of the district's mandatory core curriculum.

Credibility of the Target Group

The credibility of the target group of participants was essential to the reliability and analysis of the data. The members in this target group participated throughout the study. The responses to the Respondents' Interview Surveys (see Appendix D) indicated that 11 members, or 45.8%, of this group had taught in the classroom for more than 11 years, and 54.2% of its members had 5 or more years of experience teaching
keyboarding. Of the 24 participants, 13 members, or 54.2%, of the target group had the responsibility for teaching five to seven classes in keyboarding on a daily basis, and the remaining 11 members, or 45.8%, taught two to three classes of keyboarding daily.

The overwhelming majority of respondents (19 respondents, or 79.2%) had taught at least 20 years. The total years of teaching experiences ranged from 1 to 33 years. The statistical outliers of this measure involved 4 teachers, or 20.8%, indicating more than 30 years of classroom teaching experience; 8 teachers, or 33.3%, had 10 years of experience. The composition of teachers by actual number of years teaching keyboarding was significantly higher for teachers with 10 years or less teaching experience (79.1%) and only 5 teachers, or 20.9%, had experience teaching keyboarding ranging from 11 to over 16 years. Less than half, or 45.8%, had taught daily keyboarding classes for 5 years or less. The participants included 70.8% females and 29.2% males. The ethnic background of the participating teachers was 62.5% African American and 37.5% White. The ethnic background and gender were not major factors in this study but were included on the Respondents' Interview Survey (see appendix B). The study group of participants reflected the culture diversity within the schools in the target school district.

The researcher collected the data in the responses to Teachers' Telephone Interview Questions and used the information to measure each individual's perceptions concerning keyboarding and its significance (see Appendix E). On the question that asked whether or not teachers believed that keyboarding should be required for all students, 95.8% of the participants responded that students should be required to take keyboarding. When asked how teachers perceived the future of keyboarding, 16 participants, or 66.7%, believed in a growing future for keyboarding instruction; 8 respondents, or 33.3%, indicated the future of keyboarding was declining; and none of
the teachers perceived that keyboarding was becoming obsolete. The teachers in the study concurred with the writers of the related literature that students need keyboarding skills in the 21st century to prepare them for the technological changes in society.

From the results of Teachers' Telephone Interview Questions, an overwhelming majority of the participants believed that keyboarding was the foundation needed for students to apply other computer application skills (see Appendix F). A small minority of members believed that learning keyboarding by the sixth grade was not a priority but that it was important for students to learn keyboarding before high school. The overall perceptions of respondents acknowledged that students needed to be proficient in keyboarding with skills reinforced in other grades.

**Keyboarding Environment in the District**

The researcher analyzed the responses to the interviews (see Appendix D). The target group of participants was asked whether keyboarding instruction courses were offered at their school as an elective or a core course. The respondents perceived that 95% of the keyboarding courses were offered as an elective. When interviewed, 95% of the interviewees believed that keyboarding should be a mandatory core curriculum course. Concerning the length of the keyboarding classes offered, 54.2% of the teachers taught keyboarding courses for a period of 9 weeks during the school year; 33.3% of the teachers taught for 18 weeks; and 1 respondent, or 4.2%, taught several yearlong keyboarding courses. Approximately half of the teachers, or 41.7%, taught five keyboarding classes per day. When asked about the number of students per keyboarding class, 87% of the participants reported an average class size of 26-35 students, and 13% of teachers reported their average class size was 20-25 students. Concerning students' keyboarding efficiency, the respondents were asked whether or not a keyboarding pretest
was administered prior to initial instruction. More than 50% of the respondents answered that no pretest was administered prior to instruction. The researcher asked the participants to identify the percentage of students in their classes who achieved 35 words per minute in their keyboarding speed. Approximately 72% of the respondents recorded that less than 50% of their students achieved keyboarding at 35 words per minute (see Figure 1).

![Bar graph showing the perceived percentages of students achieving 35 words per minute.]

Figure 1. Percentage of sixth graders averaging 35 words per minute.

**Teachers' Perceptions of the Timeliness of Keyboarding**

The target school district adopted its 5-year technology plan to infuse technology into the schools curriculum in 2002. One of the technology goals was to have students proficient in word processing by the fifth grade. Teachers in 2006 perceived that students were entering middle schools with little or no keyboarding skills. Results from the teachers' surveys and interviews are discussed for each research questions in further detail in the following sections.
Research Question 1. What are the percentages of sixth graders entering middle school with little or no keyboarding skills in the local schools and district? The target group answered this question with responses that provided a variety of perceptions. Concerning their perceptions of the percentages of students entering keyboarding classes with little or no keyboarding skills, 45.7% of the teachers believed that 90% to 100% of their students had little or no keyboarding skills prior to initial instruction, and 75% of the teachers perceived that 80% of the students entering middle school had little or no keyboarding skills (see Figure 2). Erthal (1998) commented that students need keyboarding skills to communicate, extract, and disseminate information that is no longer vocational in nature, but necessary. Therefore, it is critical for children to acquire keyboarding skills early.

![Figure 2. Percentage of sixth graders with little or no keyboarding skills.](image)

Concerning the participating teachers' perceptions of children aged 10 and 11 entering the sixth grade with little or no keyboarding skills (see Appendix E), more than...
90% of the respondents strongly agreed or agreed that children aged 10 and 11 entered the sixth grade with little or no keyboarding skills, only 20.8% of the group strongly disagreed or disagreed with the question, and 16.7% did not have an opinion. Himowitz (2003) maintained that the most critical computer skill a child can learn today is keyboarding. Schools can no longer prepare students for the workplace of the future without providing them with skills necessary for using computers competently (Starr, 2001). The researcher concurred with these experts on the critical need for the development of individual keyboarding skills, especially for children.

Research Question 2. What are the perceptions of local middle school business teachers on the timeliness of keyboarding instruction? Concerning the question about the grade initial keyboarding instruction should be given, 91.7% of respondents believed the sixth grade was an appropriate grade (see Appendix E). The importance of students learning keyboarding by the sixth grade was discussed with the target group members during their interviews. A majority of the members agreed that it was extremely important for students to learn the skill of keyboarding by the sixth grade. A minority of the members believed that learning keyboarding by the sixth grade was not a priority. Some of the respondents believed that the earlier a student learned keyboarding, the more successful they would be in school.

Research Question 3. How do the perceptions of the timely policy for teaching keyboarding to students by middle school teachers compare with the local district's policy on timeliness? When the teachers of the target group were asked by the researcher, what grade level they thought that formal keyboarding instruction should be introduced to students, 45.8% of the teachers selected the sixth grade, 25% selected third grade, 16.7% chose fifth grade, 8.3% chose fourth grade, and 4.2% selected second grade. There were
no responses for any grades higher than the sixth (see Figure 3).

![Bar chart showing number of respondents per grade level]

Figure 3. Teachers' perceptions of timeliest grade to initiate keyboarding instruction.

The majority of teachers believed sixth grade was an appropriate grade to learn the skill. The higher percentages of the responses of sixth grade as the earliest time to initiate keyboarding (91.7%) and perceptions of the local district's policy on timeliness of instruction in the fifth grade (45.8%) seemed to demonstrate a qualitative rather than a quantitative difference in teachers' perceptions on the timeliness of keyboarding skills.

Multiple variables were measured in order to determine their effects on the instructors' recall of their individual awareness of the district's policy and the perceptual performance of students entering sixth grade with little or no keyboarding skills. Perceptions of the target group members on the importance of students learning keyboarding by the sixth grade indicated that a majority of the respondents were in agreement. Keyboarding was perceived as extremely important for students to learn by the sixth grade.
Interestingly, when the teachers were asked the grade required by the district's policy for initial keyboarding instruction, 10 participants, or 41.7%, reported the sixth grade; 9 participants, or 37.5%, did not know the policy; 3 participants, or 12.6%, chose prekindergarten to third grade; and 2 participants, or 8.3%, responded high school. There were no responses given for the fourth or fifth grades (see Figure 4).

![Figure 4. Teachers' perceptions of district's timely keyboarding policy.](image)

Research Question 4. When literature is researched on the timeliness of keyboarding instruction to children, will there be a recommendation? A plethora of information and diverse opinions on the timeliness of keyboarding were found during the review of related literature. According to Khan and Freyd (1990a, 1990b), keyboarding instruction is necessary despite the belief of some writers. The most frequently asked question, the earliest age at which keyboarding can reasonably be introduced, was addressed. One researcher, Britten (1988), suggested that, with consistent drill and
practice, 7-year-old students can learn to use the keyboard. Others have taken a more moderate stance, suggesting that instruction during the middle to late elementary years is appropriate (Cuffaro, 1984; Hoot, 1986; Jackson & Berg, 1986; Wetzel, 1985; Wronkovich, 1998).

Research Question 5. How do the perceptions of business teachers compare with those of the writers of the reviewed literature regarding the timeliness of keyboarding instruction of children? According to the study findings and results of the Keyboarding Education Survey in which the participants were asked to respond to the question, most respondents believed students should learn formal keyboarding skills in the sixth grade. The results revealed that 11 respondents, or 45.8%, indicated sixth grade; 4 respondents, or 16.7%, indicated fifth grade; 2 respondents, or 8.3%, indicated fourth grade; 6 respondents, or 25%, indicated third grade; and 1 respondent, or 4.2%, indicated second grade. The earliest grade level, according to participants of this study, was second grade. The perceptions of the participants varied as reflected in the results of Keyboarding Education Survey (see Appendix E).

From the evidence available about research on keyboarding, it appeared that children in early elementary school are encouraged and can learn to keyboard. Some researchers suggested that fifth grade is the ideal time. However, the fifth grade may be too late because too many bad habits may be embedded by that time. In 1987, the leaders of the National Business Education Association proposed standards for keyboarding instruction in elementary schools. They also recommended that business education teachers, rather than elementary school classroom teachers, provide the instruction. Bartholome (1998) contended that, when students start to use microcomputers to type words and sentences, they should be taught keyboarding. The emphasis of initial
keyboarding instruction for children is supported by these experts.

There appeared to be a consensus in recommendations on the timeliness of keyboarding from the tabulated data based on the responses of the target group and from the data based on the related literature. The body of literature indicated that no universal grade has been selected as the most appropriate grade to initiate keyboarding instruction. The researcher analyzed the teachers' perceptions (see Table).

Table

*Keyboarding Grade Recommendations for School District by Percentage*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12.5</td>
<td>62.5</td>
</tr>
<tr>
<td>2</td>
<td>16.7</td>
<td>50.0</td>
</tr>
<tr>
<td>3</td>
<td>54.1</td>
<td>29.2</td>
</tr>
<tr>
<td>4</td>
<td>70.9</td>
<td>20.8</td>
</tr>
<tr>
<td>5</td>
<td>62.5</td>
<td>12.5</td>
</tr>
<tr>
<td>6</td>
<td>70.9</td>
<td>12.5</td>
</tr>
<tr>
<td>High school</td>
<td>62.5</td>
<td>29.2</td>
</tr>
</tbody>
</table>

Note. $N = 24$; missing percentages = neutral responses.

The reported responses of teachers in the target group on their recommendations for the timeliest grade that they perceived that keyboarding instruction should be introduced are listed by the grades in the Results of Keyboarding Education Survey (see Appendix E). With these results, the researcher gained an understanding of the perceptions of the timeliness grade of keyboarding to children.
The results of Keyboarding Education Survey showed the majority of the schools in the target school district offered keyboarding as an elective; however, the teachers in the target group perceived keyboarding skills as vital for students to succeed. In responding to the question about whether keyboarding course should be offered as a core curriculum or an elective course, 1 participant, or 4.2%, indicated core curriculum, whereas 23, or 95.8%, responded elective course. Most of the schools offered keyboarding as an elective and not as a core curriculum subject.

**Alternative Input Devices**

The plethora of similarly varied data from the literature provided a comparison of the past, present, and future technological advances for computers, keyboarding techniques and applications, voice recognition, and keyboard readiness. The information provided by this review was helpful in tracking the effectiveness of the district's policy on the timeliness grade to initiate keyboarding instruction and to implement its own process evaluation to ensure that state-of-the-art technology and innovative methods would be used to improve the teaching and learning environment for the infusion of technology.

On the Respondents' Interview Survey, the researcher asked the participants to respond to the following questions about voice recognition: Do you teach voice recognition, are you certified to teach voice recognition classes, and do you know where to get certification in voice recognition? All the participants responded in the negative to each of the questions. The results of Respondents' Interview Survey indicated that none of the participants taught voice recognition, nor did they know how or where to get certified in the field (see Appendix D).

Research conducted by Barksdale (2002) indicated that speech recognition is
changing the computer literacy equation and is shifting the requirements for academic and career success. Perhaps the most exciting new trend about to sweep schools and reshape the world view in the process is speech or voice recognition. In light of these new developments, the trend will be to train teachers. In 1997, Dragon Systems, released its first continuous speech recognition system called Naturally Speaking that has a large vocabulary (Dragon Systems, 2001). Szul and Moore (1999) reported that speech recognition software has been identified as the wave of the future and is worth the time and effort to learn. This new technology will enhance the learning environment and marketable skills for students with special needs.

No longer is voice recognition in a realm of science fiction; it has become a reality according to Szul and Moore (1999). The researcher of this applied dissertation invested in the Naturally Speaking software program to explore its usefulness and found the software to be interesting to use but preferred to use the keyboard for data input. Will this new technology change the way students are taught computer skills in the future? Sure, voice recognition is certain to make its impact and technological presence felt. However, voice recognition will not replace the keyboard or the need to emphasize proper keyboarding techniques to develop the required proficiency in keyboarding. The keyboard, as it has been known historically, will not become obsolete anytime soon. However, voice recognition software is considered to be cutting-edge technology and state of the art. The researcher's results indicated that there is the need to introduce keyboarding early on to children. The trend to use voice recognition is now; and likewise, the need for the timely introduction of keyboarding instruction is long overdue.
Chapter 5: Discussion

Discussion of Perceptions

The mixed-methods research design for this dissertation was developed to provide and analyze data. The data were collected and tabulated based on teachers' perceptions. Through data analysis in this study, the researcher investigated both independent and dependent variables that were triangulated with the controlled variables. This approach enabled the researcher to clearly identify, compare, and discuss both qualitative and quantitative data. A comparative study of measured variables on the preferences for the timeliest grade to initiate keyboarding instruction was implemented. Teacher responses related to the grade for initial keyboarding instruction and to the review of the district's policy on keyboarding were considered. The findings of this research would probably not be generalizable but could serve as one piece of the puzzle in determining how the district could meet its responsibility to initiate timely keyboarding skills to all students in every school within the district.

With this applied dissertation, the target school district would gain a tool that was designed to assess its present policy on the timeliness of keyboarding instruction and the effectiveness of implementing that policy. The district would have a unique opportunity to broaden and to improve its existing technological program through the development of an innovative restoration plan. The district's consideration of keyboarding as a priority in curriculum development and as a required basic skill would be critical to the successful preparation of all students in a technologically advancing society. Some sweeping school changes have been proposed in the Florida Legislature in 2006. The A-plus-plus bill has been introduced with an expectation of successfully passing a final vote by Florida House legislators. Fineout (2006) noted, "The legislation would require that sixth-grade students
take a year-long course that offers nine weeks each in art, music, physical education and career and technical education" (p. B10).

Discussion of Research Questions

In the following paragraphs, the research findings for each research question are discussed. Research Question 1 asked, What are the percentages of sixth graders entering middle school with little or no keyboarding skills in the local schools and districts? To determine how teachers' perceived the percentage of sixth graders entering middle school with little or no keyboarding skills, the researcher used surveys (quantitative data) and interviews (qualitative data) and measured the perceptions of middle school teachers on the actual percentage of sixth graders entering middle school with little or no keyboarding skills in the district. The results indicated a high percentage of sixth grade students were entering middle school with little or no keyboarding skills.

With these facts, the researcher analyzed the received responses in comparison with the competency milestone of the district's technology plan. The milestone stated that fifth graders should be proficient in word processing. The researcher used the milestone as a representation of the district's policy commitment to introduce timely keyboarding to students. For students to be proficient in word processing, the researcher believed students had to possess at a minimum basic keyboarding skills. With this hypothesis, the researcher compared the teachers' perceptions on the percentage of sixth graders entering middle school with little or no keyboarding skills with the competency milestone of the district's technology plan.

Through data analysis, the researcher was able to determine the effectiveness of the district in the implementation of its milestone. As the results indicated, teachers' perceptions revealed that the district was ineffective in implementing its milestone. The
fact that a majority of the middle school business teachers perceived a high percentage of entering sixth graders with little or no keyboarding skills was significant. Moreover, as the only control variable, this topic received the highest percentage of responses from teachers. The data retrieval reports indicated that teachers perceived that nearly 90% of students lacked needed keyboarding skills at the sixth-grade level. Those responses were an integral part of this research study. The implication was that the entering sixth graders had little or no keyboarding skills and, thus, were not proficient in word processing by the end of the fifth grade, as stated in the competency milestone of the district's technology plan.

Research Question 2 asked, What are the perceptions of local middle school business teachers on the timeliness of keyboarding instruction? This question was designed by the researcher to determine the multiple perceptions of the district's middle school business teachers on the timeliness of keyboarding instruction. The responses to the Keyboarding Education Survey, the Respondents' Interview Survey, and the Teachers' Telephone Interview Questions provided data for analysis. The data included recommendations on the timeliest grade for keyboarding instruction. The instructors responded with several different recommendations of grades that they considered to be the timeliest for initial keyboarding instruction. The sixth grade and the third grade received the highest percent of recommendations for the timeliest grade (see Appendix E). When the instructors were asked to rate each suggested grade level for timely initial keyboarding instruction from strongly agree to strongly disagree, the fourth and sixth grades received the highest percentages of responses for the timeliest grade for initial keyboarding instruction.

The practice in the district for the timeliest grade for initial keyboarding
instruction was the sixth grade. This practice was evident when the respondents reported 91% of their initial keyboarding instruction began in the sixth grade. Because of the district's practices of initial keyboarding instruction being introduced in the sixth grade and because of the respondents being business education teachers who provided keyboarding instruction, the researcher questioned the sixth grade as the recommendation of the middle school instructors during the teacher interviews. The respondents' reported a high negatively skewed frequency distribution on the topic of whether or not the sixth grade was the timeliest grade for initial basic keyboarding instruction to begin (see Appendix E). Further, the respondents, during the interviews, recorded a high negative frequency on the topic of business teachers reportedly being unable to work with sixth graders on mastering computer applications. Their chief reported reason for this frustration was a lack of a requirement for initial keyboard instruction prior to sixth grade.

In comparing all of the data combined with the researcher's more than 25 years of experience as a middle school keyboarding instructor, she determined that the third and fourth grades represented the recommendation of the middle school instructors in the district as the timeliest grades for initial keyboarding instruction. This recommendation was congruent with the professional opinions of keyboarding experts in the related literature.

Although the target school district specifically required or recommended that certain keyboarding be taught, the researcher was able to ascertain a pattern that was comparable to that of the reported literature on the appropriate grade to initiate keyboarding instruction. The recommendation of the third and fourth grades being the timeliest grade for initial keyboarding instruction provided by the middle school teachers,
in comparison with the district's current policy on the timeliness of keyboarding instruction, was the basis for Research Question 3. According to the competency milestone, the district's policy currently required students to be proficient in word processing by the fifth grade. The researcher's theory was that in order to achieve this competency goal, initial keyboarding instruction would have to be offered to students prior to the fifth grade.

Significantly, instructors did not perceive that students had achieved mastery of keyboarding skills by the time they reached the sixth grade level. Those skills were not getting any better in Grade 5. The fact might be that no fifth-grade students were acquiring the necessary skill level as mandated by the district's competency milestone. The timeliness of keyboarding skills by the sixth grade might not be obtainable if not mandated and practiced by fifth grade. Though the expectations of the competency milestone were that fifth graders would be proficient in word processing, it was increasingly evident that they could not be proficient if they were not taught keyboarding instruction in earlier years. Since fifth graders were not taught word processing skills in elementary schools in the district as perceived by middle school instructors, it was unlikely that the students would achieve proficiency in word processing during fifth grade, thus, making the milestone unachievable.

In addition, the goals for fifth graders in the district were not being met even though the district has had a policy that has expected yields of 100% for achievement of proficiency in word processing by all fifth graders. This discrepancy explained why middle school business teachers were encountering students with little or no keyboarding skills.

The variable of perceptions was difficult, if not impossible, to quantify. Although
the largest proportion, or 70.9%, of instructors perceived that sixth grade was the
timeliest grade to introduce keyboarding to students in the district, the designed mixed-
methods data collection, comparative analysis, and triangulated results and findings of
the perceptions of the instructors indicated that keyboarding instruction should be
introduced within all elementary schools, specifically, in Grades 3 and 4.

The district's policy required offering timely keyboarding instruction to students
in elementary grades was supported by middle school business teachers. This support of
the district's timely policy of offering keyboarding instruction to elementary school
students was important and critical. These professional experts were in the best position
to provide factual evidence to the district leaders on the effectiveness of the
implementation of the timely policy of providing keyboarding instruction to elementary
school students. These experts interacted with the elementary students when they arrived
at middle school as entering sixth graders. At that time, students' keyboarding
competencies were evaluated. The data showed that a significant percentage, or 80%, of
the teachers perceived that only 20% of students were proficient in keyboarding by Grade
6. More importantly, only one third of the students were showing competency. Moreover,
100% of teachers perceived competency attainment as decreasing because entering sixth
graders were unprepared in keyboarding. Starr (2001) reported that students should not
be expected to keyboard until they have been taught how to keyboard.

As indicated by research conducted for this study, teachers perceived that
keyboarding skills and students' preparedness for successfully achieving fifth- and sixth-
grade competencies in accordance with the local school district's mandate was
nonexistent. The research indicated 100% of the teachers perceived that nearly 90% of
the students had little or no keyboarding skill by the time they entered the sixth grade.
The researcher was able to ascertain a consistent nationwide and a district-wide pattern concerning the appropriate grade to initiate keyboarding instruction. In the extensive literature review, she found that experts were not in agreement. Simply, there was not one grade identified consistently, despite the importance of such a determination.

Research Question 3 asked, How do the perceptions of the timely policy for teaching keyboarding to students by middle school teachers compare with the local district's policy on timeliness? The data collected answered and provided the researcher with related comparative conclusions. Again, the results were used to address the questions set forth by the researcher. An interesting conclusion presented from the data involved communications by the district on its policy on the timeliness of keyboarding instruction. When the researcher asked the middle school teachers about their awareness of the grade level promoted by the district on the timeliness of keyboarding instruction, 41.7% of the teachers selected the sixth grade. Clearly, the majority of the respondents were unaware of the district's policy. The responses revealed that 37.5% of the instructors did not know that the district timely keyboarding policy existed. The researcher, thus, concluded that the district's communication of its policy vision for timely keyboarding instruction was not effectively communicated to the middle school instructors. The researcher found that middle school business teachers were a valued asset to the district in its effort to fulfill its vision policy on timely keyboarding instruction.

Research Question 4 asked, When literature is researched on the timeliness of keyboarding instruction to children, what will be the recommendation? This question required the researcher to identify the recommendations for the timeliness of keyboarding instruction from the review of related literature. She found the recommendations to be diverse. As a result of the varied keyboarding experiences, the researcher determined that
instruction might be tailored to accommodate individual needs, or that perhaps the
greatest challenge might be developing consistent keyboarding competencies throughout
all schools in the target school district.

Some participants and keyboarding experts recommended the third grade for
initial keyboarding instruction. Other researchers (Bartholome, 1996; Erthal, 1998;
Fleming, 2002; MacIntyre, 1990) recommended the fifth grade as the most appropriate
grade level for initial keyboarding instruction. Still, other experts believed that an
elementary grade was the most appropriate level (Davidson & Kochmann, 1996; Jackson
& Berg, 1986; Neiman, 1996; Sormunen, 1991). Yet, other keyboarding experts showed
a preference for initial keyboarding instruction beginning when children start to use the
computer (Robinson, 1992).

From the review of related literature, the researcher verified that the leaders of
education departments in some states have suggested various grades to mandate initial
keyboarding instruction. For nearly 20 years, the leaders of the Texas Education Agency
(1987) have mandated that students be proficient in word processing by the fifth grade.
The researcher believed initial keyboarding instruction must be offered to students in the
earlier elementary grades in the district. Erthal (1998) reported that the staff of the
Georgia State Department of Education has recently mandated keyboarding instruction in
the fifth grade. Other states that have mandated keyboarding instruction for their students
in the elementary grades include Minnesota, New York, Virginia, and others.

Through a careful review of literature, the researcher was unable to determine
from the experts (Fleming, 2002; Gilberstad, 2002; Gruss, 2003) in the field of
keyboarding any consistent recommendations for the timeliest grade for initial
keyboarding instruction. However, some keyboarding experts (Bartholome, 1998;
Robinson, 1992; Starr, 2001; Toppe, 1991) commented that keyboarding instruction to children for skill development is essential to the success of integrating computers into education. Furthermore, these experts have delivered an urgent call to educational leaders to adopt a new philosophy that will clearly address technology in education and that will make keyboarding competency a priority. A call to order must be imposed in an effort to negotiate proper training to prepare all students to become a computer-literate workforce and to increase training for teachers to meet the demand and pressing need of providing quality computer and technology training to all students from kindergarten through twelfth grade. Teachers must be trained to improve the teaching of technological literacy. As educational leaders, policymakers need to make the greatest challenges happen.

The researcher was able to acquire data that provided a basis for recommendations that indicated that the initiation of keyboarding instruction was perceived to be best taught early in elementary grades. It was suggested that initiating keyboarding to students from prekindergarten through the fifth grade would greatly enhance educational leaders’ efforts to maximize the integration of computers into education.

Research Question 5 asked, How do the perceptions of business teachers compare with those of the writers of the reviewed literature regarding the timeliness of keyboarding instruction of children? The diverse opinions on the timeliest grade for keyboarding instruction identified in the literature reflected the differing opinions that existed among the middle school business teachers in the district. In comparison, the suggested recommendations for the timeliness of keyboarding instruction from these two groups left the researcher with the fact that no one grade has been identified as the timeliest for initial keyboarding instruction. Reflecting on views documented in the
literature and the middle school professionals, the researcher found that both groups suggested several different elementary grades as the timeliest for keyboarding instruction. A consensus did exist between the recommendations in the literature and recommendations of local middle school teachers in the field for one single grade. Nevertheless, the recommendation for the timeliest grade to initiate keyboarding instruction to students was prior to Grade 6, and, specifically, Grades 3 and 4 were perceived the timeliest levels to initiate keyboarding instruction.

Limitations

The applied dissertation study had the following limitations:

1. The study presented key comparisons across only one school district.
2. The results of this study were limited due to the small population that was surveyed.
3. There was not a 100% response rate in the initial selection of prospective participating schools since 3 of the 27 potential participants declined to be involved in the study. Therefore, the findings did not accurately reflect the perceptions of the entire district's business education staff.
4. The study was limited to middle school business instructors who teach keyboarding.
5. The responses to the survey reflected teachers' perceptions. Since these were merely questions designed to generate the teachers' opinions and subjective responses, the teachers were not expected to act on them.
6. The teachers might not have been completely honest when filling out the survey.
7. Only principals who offered a keyboarding curriculum and gave approval
(100%) for participation in the study were identified as sources for selecting participants in the study group.

Recommendations

The researcher of the applied dissertation study has made the following recommendations:

1. Funding should be prioritized for local technology program improvement.

2. Keyboarding curriculum offerings in the district should be assessed and, as needed, should be revised.

3. Keyboarding instruction should be mandatory for all students (K-12).

4. The keyboarding policy should be revised in order to expand the current technology milestone.

5. Activities should be provided to promote keyboarding awareness in the district schools.

6. A plan should be established to initiate keyboarding at the elementary level that includes hiring new qualified business education instructors.

7. District educators should plan to make adjustments in the district policy to begin initial keyboarding by first grade.

8. School officials should develop a strategic action plan for technology in the new millennium.

Conclusions

Middle school business teachers perceived a majority of students to be entering sixth grade with little or no keyboarding skills. The timely keyboarding policy of the target school district called for students to be proficient in word processing by the fifth grade. Based on the results of this study, the district's timely keyboarding policy was not
being uniformly implemented. During the interviews with the participants, the researcher found that many of them expressed the need for keyboarding to begin at the elementary level. Starr (2001) reported, "Schools can no longer prepare students for the workplace of the future without providing them with skills necessary for using computers competently. One of those necessary skills is, of course, keyboarding" (p. 1). Through the data that were collected and analyzed, the researcher found that the timeliest grade for initial keyboarding instruction was considered third and fourth grades. In summary, the research results in the study revealed the following findings:

1. The perceptions of middle school business teachers on the timeliness of keyboarding instruction supported the intent of the district's competency milestone. However, students' competencies were not being met (see Appendix E).

2. Teachers' perceptions supported those of the writers of the related literature whose studies were reviewed on the timeliness of keyboarding instruction for students in elementary grades from kindergarten through Grade 5.

3. A high percentage (90%) of students was perceived as entering middle schools with little or no keyboarding skills.

4. Modifications to keyboarding curriculums to accommodate the technology competency milestone for students needed immediate consideration (see Appendix F).

5. Unfortunately, schools across the nation have not been adequately preparing students for technology literacy in the 21st century.

The researcher has experienced nearly 30 years of extensive business education classroom teaching. She agreed with the writers of an extensive body of literature who asserted that children are ready to learn keyboarding when they begin to move their fingers independently on command and develop an interest in computer usage.
As a result of the increased presence of computers in daily lives at home, school, work, and business, the demand to teach and to learn keyboarding is growing. The perceptions and opinions of educators related to the most appropriate age and grade of students to be taught keyboarding will continue to be an important issue in public education. Educators are expected to provide and will continue to be expected to decide the timeliness and appropriateness of keyboarding instruction and the infusion of technology into education for all children.

Recommendations for Further Research and Practice

The district should consider designing specific action steps that describe strategies to be used to determine how keyboard proficiency will be accomplished by students in prekindergarten through fifth grades. If not, the district should be concerned about the riveting feedback from participating teachers that indicated that 90% of students in the school district enter Grade 6 with little or no keyboarding skills. One can ascertain from this data that the issue is not just a perception, but a concerning reality. Further research is needed to determine whether the findings of this study are specific to the school district being studied or if they are generalizable to most middle schools.

Conducting keyboarding pilots for elementary students by certified business teachers to determine keyboarding instruction effectiveness at this level is an issue. Researching students' perceptions of keyboarding skills at the elementary, middle, and high school levels to construct a strategic plan to promote awareness for students' acquisition of keyboarding skills could provide useable data. This data would give the district insight into what students' value as important skills to promote their success in achieving excellence. A district-wide survey to parents, guidance counselors, business community, students, and administrators on keyboarding would provide valuable
information for the assessment of curriculums on timely keyboarding and further investigation for the implementation of keyboarding readiness in elementary schools. A comparative study of state educational agencies that require keyboarding skills could be conducted.

How students have improved in academic subjects as a result of using word processing skills must be explored. Starr (2001) contended, "There is no longer an ideal time for formal [keyboarding] instruction because younger and younger children are imitating older siblings and parents by wanting to work with computers" (p. 1). The researcher found that keyboarding is the missing link in the digital divide. Keyboarding is the universal, essential skill that will truly revolutionize computer proficiencies in schools, homes, and the workplace.
References


Feutz, R. (2001). *LittleFingers: The first and only adult-quality keyboard scientifically...*


Robinson, J. T. (1992). *Improving computer keyboarding skills in third through fifth grade students.* Unpublished manuscript, Nova Southeastern University, Fort Lauderdale, FL.

Robinson, J. W., Erickson, L. W., Crawford, T. J., Beaumont, L. R., & Ownby, A. C.


Appendix A

Keyboarding Education Survey
Keyboarding Education Survey

1. Is the keyboarding course offered at your school a/an ______? (Choose One)

Core Curriculum _____   Elective Course _____

2. What grade is initial keyboarding instruction given? (Choose all that apply)

Sixth_____ Seventh_____ Eighth_____  

3. Do you administer a keyboarding pretest to students prior to initial keyboarding instruction?

_______________Yes _____________No

4. From your experience, what are your perceptions of the percentages of students entering keyboarding instruction with little or no keyboarding skills?

100% _____   70% _____   40% _____   10% _____ 
90% _____   60% _____   30% _____   5% _____  
80% _____   50% _____   20% _____   0% _____ 

5. At what grade level do you think formal keyboarding instruction should be introduced to students? (Choose One)

_______________Preschool/Kindergarten _____________Fourth Grade
_______________First Grade                          _____________Fifth Grade
_______________Second Grade                       _____________Sixth Grade
_______________Third Grade                        _____________High School

6. What grade is the district's policy for initial keyboarding instruction?
7. Do you think students should be required to take keyboarding classes?

______________Yes   _________________No

8. How do you perceive the future of keyboarding instructional classes?

_________declining  _______growing ____________obsolete

9. What would be your recommendations for the district on the timeliest grade level for initial keyboarding instruction?

Preschool/Kindergarten
___Strongly Agree   ___Agree   ___Neutral   ___Disagree   ___Strongly Disagree

First Grade
___Strongly Agree   ___Agree   ___Neutral   ___Disagree   ___Strongly Disagree

Second Grade
___Strongly Agree   ___Agree   ___Neutral   ___Disagree   ___Strongly Disagree

Third Grade
___Strongly Agree   ___Agree   ___Neutral   ___Disagree   ___Strongly Disagree

Fourth Grade
___Strongly Agree   ___Agree   ___Neutral   ___Disagree   ___Strongly Disagree
Fifth Grade
___Strongly Agree ___Agree ___Neutral ___Disagree ___Strongly Disagree

Sixth Grade
___Strongly Agree ___Agree ___Neutral ___Disagree ___Strongly Disagree

High School
___Strongly Agree ___Agree ___Neutral ___Disagree ___Strongly Disagree

10. What is your perception of 10 and 11 year olds entering the sixth grade with little or no keyboarding skills?
___Strongly Agree ___Agree ___Neutral ___Disagree ___Strongly Disagree
Appendix B

Respondents' Interview Survey
Respondents' Interview Survey

1. Teacher ID# ______________________________________
2. School location#: ___________________________________
3. Gender: _____
4. Ethnic Background: ______
5. Inner City School   ____   Suburban School   _____
6. Number of years teaching in the classroom   _____
7. Number of years teaching keyboarding   ____
8. Number of daily keyboarding classes taught   ____
9. Average number of students per keyboarding class   ____
10. Average length of keyboarding course   ____
11. Average percentage of students per class achieving 35 wpm keyboarding skills   ____
12. Do you teach voice recognition?   ___ yes   ___no
13. Are you certified to teach voice recognition classes?  ___yes    ___no
14. Do you know where to get certification in voice recognition?  ___yes    ___no
Appendix C

Teachers' Telephone Interview Questions
Teachers' Telephone Interview Questions

1. What are your suggestions to promote students' awareness of keyboarding skills?

2. What barriers will the district face incorporating mandatory keyboarding classes?

3. How important is it for students to learn keyboarding by 6th grade?

4. What are your perceptions about keyboarding as a mandatory core curriculum subject?

5. What would be your recommendations to the district regarding keyboarding skills for students?

6. How do you feel about your involvement in this research study?

7. What would you recommend for future research on the timeliness of keyboarding skills for students?
Appendix D

Results of Respondents' Interview Survey
## Results of Middle School Business Teachers' Interview Survey

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*Note. N = 24.*
Appendix E

Results of Keyboarding Education Survey
### Results of Keyboarding Education Survey

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7. Should keyboarding be required

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8. Future of keyboarding

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9. Recommendations to district

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| Grade 6     | 13             | 4     | 4       | 1        | 2                |
| Strongly agree | 54.2         | 54.2  | 54.2    |          |                  |
| Agree       | 16.7           | 16.7  | 70.8    |          |                  |
| Neutral     | 16.7           | 16.7  | 87.5    |          |                  |
| Disagree    | 4.2            | 4.2   | 91.7    |          |                  |
| Strongly disagree | 8.3         | 8.3   | 100.0   |          |                  |

| Grades 9-12 | 11             | 4     | 2       | 7        |                  |
| Strongly agree | 45.8         | 45.8  | 45.8    |          |                  |
| Agree       | 16.7           | 16.7  | 62.5    |          |                  |
| Neutral     | 8.3            | 8.3   | 70.8    |          |                  |
| Strongly disagree | 29.2         | 29.2  | 100.0   |          |                  |

10. Perceptions of 10-11 year olds with little or no keyboarding skills.
| Strongly agree | 9              | 37.5  | 37.5    | 37.5    |
| Agree         | 6              | 25.0  | 25.0    | 62.5    |
| Neutral       | 4              | 16.7  | 16.7    | 79.2    |
| Disagree      | 2              | 8.3   | 8.3     | 87.5    |
| Strongly disagree | 3           | 12.5  | 12.5    | 100.0   |

*Note. N = 24.*
Appendix F

Results of Teachers' Telephone Interviews
Results of Teachers' Telephone Interviews

1. What are your suggestions to promote students' awareness of keyboarding skills?

Respondent 1: Begin keyboarding in elementary school about the second grade.

Respondent 2: Make it a requirement for 6th graders. Offer it for 9 weeks to students.

Respondent 3: Keyboarding should be a requirement for all students, especially 6th graders. Encourage counselors and teachers to promote the importance of keyboarding. Initiate and implement a district plan to improve students' about keyboarding skills.

Respondent 4: A self-awareness of computers will help them become involved in keyboarding skills. Children's accessibility to computers is prevalent in our schools. Some children need to overcome their fears when using computers, keyboarding can be that springboard.

Respondent 5: Students can be made aware of keyboarding skills through school newsletters, morning announcements and through colleagues. Students need to be made aware of the importance of keyboarding.

Respondent 6: Teachers across the curriculum supporting business teachers in their efforts of promoting keyboarding awareness skills to students. Have a school wide district keyboarding contest with awards and incentives for students.

Respondent 7: Emphasize the importance of the use of computers in the world of work. Involve parents to promote proper keyboarding skills at home.

Respondent 8: Provide students with guest speakers. Have students explore job ads with typing speed requirements for class discussions.

Respondent 9: Talk with teachers and parents to make them aware of the importance of keyboarding skills. Emphasize how keyboarding skills can help them across their curriculum. Business teachers need to be aggressive when promoting their program within the schools and at the district level. During team/grade level meetings show sample of students' work.

Respondent 10: Get support from elementary teachers through cross curriculum subjects to help support and emphasize the importance of keyboarding.

Respondent 11: Start keyboarding skills in elementary, about 3rd grade. Make it mandatory in middle and high school. Offer it as a special elective in
elementary school.

Respondent 12: More free keyboarding websites would be helpful.

Respondent 13: Make keyboarding a requirement at the middle school level. Students should learn keyboarding by 3rd grade.

Respondent 14: Guidance counselors should help promote the awareness of keyboarding skills using pamphlets/brochures.

Respondent 15: Provide additional supplemental keyboarding entertainment software that motivates the students. Provide other teaching methods. The traditional method of teaching keyboarding is not effective.

Respondent 16: Teachers need to demonstrate the proper skills of keyboarding. Have students to encourage others to learn keyboarding skills. Parents can encourage them to be multi-talented by practicing at home.

Respondent 17: Parents should encourage keyboarding skills and business applications through keyboarding classes. Counselors and administrators need to support business teachers by encouraging students to enroll in keyboarding classes.

Respondent 18: Have students demonstrate proper techniques at all times.

Respondent 19: Indicate that keyboarding skills are needed for:
   (a) E-mail and Internet use;
   (b) A good portion of high school and college work;
   (c) Many full- and part-time jobs require it; and
   (d) Doing everyday work or starting your own business.

Respondent 20: Promote software packages for keyboarding skills at home and over the Internet. Encourage students to practice keyboarding as often as possible.

Respondent 21: Challenge students to type other school work frequently. Have them do research on jobs that require keyboarding skills.

Respondent 22: Add keyboarding classes to the extended day programs. Offer volunteer hours to students that participate in keyboarding classes. Provide incentives and rewards to students that participate in keyboarding classes.

Respondent 23: No, I do not.

Respondent 24: Promote keyboarding skills through career awareness, entrepreneurship, and other interdisciplinary subjects.
2. What barriers will the district face incorporating mandatory keyboarding classes?

Respondent 1: Parents feeling it will interfere with students' FCAT preparation.

Respondent 2: Money would be a big factor. In many schools electives are being eliminated.

Respondent 3: Obstacles will come from parents thinking their child doesn't need to know keyboarding skills. With FCAT as a priority, keyboarding skills will not be a priority.

Respondent 4: Training elementary teachers will be needed along with additional funding.

Respondent 5: Low test scores are causing the district to eliminate some electives and replace them with critical thinking skills.

Respondent 6: FCAT prep in reading, writing and math. Funding, scheduling, and other resources will be a problem for the district.

Respondent 7: Large keyboarding classrooms result in students not having computers or inadequate equipment to use for achieving proficiency.

Respondent 8: Money for keyboarding programs and/or equipment.

Respondent 9: The financial commitment to upgrade hardware and software to meet the needs of the students. The district will have a problem with equipment upkeep and providing unified labs of equipment, and software in all schools.

Respondent 10: Funding issues and the cost involved. Finding qualified teachers to teach keyboarding. Training elementary teachers to teach keyboarding will change certification requirements.

Respondent 11: Money will be their major issue. There is just not enough money and resources for every child at every school to have access to computers.

Respondent 12: None that I can see.

Respondent 13: Finding enough computers and time in the school day to require such a mandate.

Respondent 14: Providing equipment and computer rooms to accommodate keyboarding classes. An ongoing plan to update equipment and provide better service plans. Many schools are losing their electives because schools are not meeting Annual Yearly Progress (AYP).
Respondent 15: Addressing more innovative ways to promote keyboarding skills. Having all stakeholders to buy into a policy on keyboarding will be challenging.

Respondent 16: Funding. Most of the funds are directed for FCAT preparation. Finding qualified teachers to replace retired business teachers will be difficult. Meeting AYP due to the accountabilities mandated by No Child Left Behind (NLCB).

Respondent 17: Some senior management feel keyboarding or electives are unimportant. Convincing stakeholders keyboarding is vital and needs to be taught by qualified teachers.

Respondent 18: Educational leaders do not emphasize the importance of keyboarding.

Respondent 19: Scheduling problems and physical plant infrastructures. FCAT has devalued all elective studies. Middle school students are required to take reading. Hardware and software upkeep will pose a problem for local schools in the district.

Respondent 20: Keyboarding is not seen as an important class. The district needs to acknowledge the importance of keyboarding skills.

Respondent 21: Taking time away from FCAT testing. Not important because voice recognition programs will soon be perfected.

Respondent 22: Students questioning and adjusting to why keyboarding has been made mandatory.

Respondent 23: The barriers should be minimal because of the tool which is used to deliver instruction is a computer.

Respondent 24: There should not be any obstacles for the district. You are reinforcing FCAT, writing, and interpersonal skills through keyboarding skills.

3. How important is it for students to learn keyboarding by 6th grade?

Respondent 1: Keyboarding is quite important for students; it helps prepare them for more advanced computer skills. It will also help them later in high school.

Respondent 2: Students are mature enough to handle a keyboarding class before the 6th grade.
Respondent 3: Keyboarding is very important. More often teachers are requiring students to type reports, conduct research, and prepare multimedia presentations. The earlier they learn keyboarding the more successful they will be in other cross-curriculum subjects.

Respondent 4: Keyboarding skills is very important because the more students use computers they will become more aware of its many uses and functions, especially when they can keyboard. It will make them more self-sufficient with few limitations.

Respondent 5: Learning keyboarding skills is very important for students because they will need them for other computer application activities. The earlier students learn keyboarding the better for students. Certification needs to be changed for business teachers to allow them to teach keyboarding in elementary schools.

Respondent 6: Very important because of the rapid growth of computers in our schools, homes and society.

Respondent 7: Students need to be familiar with the basic skills of keyboarding in order to advance in other computer application areas.

Respondent 8: It is extremely important. They are halfway through their free education by 6th grade. There is so much more in information technology that they could take advantage of, but they have to be at a certain level to get on track. If they are behind in keyboarding, they will not have enough time to get in all the classes.

Respondent 9: Students need a basic knowledge by 6th grade and more advanced knowledge of skills by 8th grade. Teach the entire family by sharing knowledge and providing facilities.

Respondent 10: Somewhat important—not necessary by 6th grade. Middle school should be the initial grade level and by 8th grade they need to be proficient.

Respondent 11: Extremely important; students need to be in more advanced applications by sixth grade, so keyboarding should be a prerequisite for middle school students.

Respondent 12: Students need to develop keyboarding skills as early as possible...middle school age students are at a crucial development stage.

Respondent 13: Very important because the students learn bad habits by this age group.
Respondent 14: Keyboarding is critical for students to complete research reports, letters and other projects. Improper keyboarding skills causes' health related injuries.

Respondent 15: Very important for students in order to be proficient in other computer applications. Everyone should have an opportunity to learn keyboarding skills.

Respondent 16: Important because of the more frequent use of computers for research, term papers and other projects.

Respondent 17: Vital students need to learn proper keyboarding techniques and skills to enhance their use of application software packages, such as Microsoft Office.

Respondent 18: Keyboarding skills are essential for all students.

Respondent 19: Not very important by 6th grade but helpful. However, it is very important to learn keyboarding by high school, 9th grade. Between 6th and 9th grade is the time to learn keyboarding skills.

Respondent 20: Extremely important because by the time students enter middle schools teacher assignments are more demanding and requires typing of reports and term papers. Students should start keyboarding by the 4th or 5th grade.

Respondent 21: Terribly important; it's a skill that they will use personally, recreationally, and professionally in life.

Respondent 22: It is very important because many students began research projects in middle school which require the use of a computer.

Respondent 23: It's not that important. But they should at least be familiar with basic computer instruction.

Respondent 24: Keyboarding prepares students for career opportunities and life skills with personal benefits.

4. What are your perceptions about keyboarding as a mandatory core curriculum subject?

Respondent 1: Keyboarding should be a mandatory course for all students. Lesson plans must be restructured to accommodate students' needs. My observations find 7th and 8th grade students are deficient in typing skills and they need constant reinforcement practice.
Respondent 2: Keyboarding skills are critical to all students. It needs to be offered to every child.

Respondent 3: Keyboarding should be mandatory because students will benefit highly from learning such a life-long skill.

Respondent 4: Keyboarding needs to be mandatory in my opinion. Children love computers; if keyboarding was integrated at the elementary level it would work because there are many areas in which students can learn more about computers. Keyboarding will keep the interest of students.

Respondent 5: Technology changes have required keyboarding to be a vital skill needed by all students.

Respondent 6: Keyboarding should be a mandatory class for all sixth graders.

Respondent 7: I most definitely feel it should be a mandated course because of the impact of computers in our daily lives.

Respondent 8: I would implore anyone to find a job these days that doesn't require some computer usage. If your job doesn't, then your life does. Online banking, insurance claims, e-mailing information, and e-cards to your family for the holidays. You have to be able to use a computer to exist in this world, and it is only going to become more important in the future as technology advances.

Respondent 9: It should be offered as an elective. It would be hard to provide keyboarding as a mandatory core curriculum subject. It appears keyboarding classes and business programs are declining in other schools in the district. There are not enough qualified teachers to teach proper keyboarding skills in the district or elementary schools.

Respondent 10: I believe that keyboarding should be required at the 6th grade level for all students.

Respondent 11: Keyboarding is important and should be implemented into all middle school curriculums.

Respondent 12: I don't know about core curriculum but as an elective, yes.

Respondent 13: Keyboarding should be required. As an elective class students appear to not take keyboarding skills very serious.

Respondent 14: Should not be mandatory but should be offered more frequently, such as 6 weeks or 9 weeks, to accommodate more students throughout the school year.
Respondent 15: It should not be mandatory even though students need it. Students should have an option of acquiring the skill of keyboarding.

Respondent 16: Keyboarding is beneficial if it is implemented early. Taught at the early elementary level will hinder hunting and pecking and provide them with essential basic keyboarding skills.

Respondent 17: I firmly believe keyboarding classes should be mandatory for all students, even in elementary.

Respondent 18: Keyboarding classes should be mandatory for all students.

Respondent 19: Both keyboarding business and computer science course should be taken before high school and passed!

Respondent 20: Keyboarding skills are needed. They are a vital part of students' schooling.

Respondent 21: By learning correct keyboarding skills students can use more time to acquire knowledge in other technological areas.

Respondent 22: Adding keyboarding as a mandatory core curriculum will provide opportunities for students that participate in on-the-job-training (OJT).

Respondent 23: Yes, because the skills one can acquire is necessary in today's electronic and technologically advanced society.

Respondent 24: Keyboarding should have always been a core curriculum. Keyboarding can enhance writing, language and communication skills. They can also help students with reports and presentations.

5. What would be your recommendations to the district regarding keyboarding skills for students?

Respondent 1: Make keyboarding mandatory for students across curriculum involvement is needed.

Respondent 2: Make it an academic core curriculum subject. It should be a prerequisite for students.

Respondent 3: Require all sixth grade students to take keyboarding skills and it should count toward promotion and/or graduation. Keyboarding should be a part of the FCAT.
Respondent 4: Keyboarding is vital to the success of our students. If students are able to use the keyboard in a successful manner, they will be more productive in doing research, typing reports, and essays. It would be most beneficial for them. Students love computers and keyboarding will only enhance the skills they already know.

Respondent 5: Integrate keyboarding through all subject areas.

Respondent 6: Mandatory for all middle school 6th graders and reinforced in 7th and 8th grades.

Respondent 7: Make it a mandatory course definitely in middle school. It should be mandatory because technology is ever-changing and students need to be required to learn skills relevant to their future, starting with keyboarding skills.

Respondent 8: Starting in 3rd grade, so by middle school, we can start and master Microsoft Office, so in high school, they can go into the Academy of Information Technology (AOIT).

Respondent 9: Provide two teachers to two lab set-ups for teaching keyboarding skills. Keyboarding is a skill needed for the future. Have a commitment from the school board to promote keyboarding for all students in the district. It's a win-win situation for everyone.

Respondent 10: By the 6th grade students should be keyboarding. Add a seventh period day with keyboarding as a required elective.

Respondent 11: Start them in elementary school learning keyboarding. By eighth grade students should be proficient in keyboarding.

Respondent 12: Nothing different…keep it the same.

Respondent 13: Keyboarding is a skill everyone will need now and in the future. Map a plan for the implementation of keyboarding skills for students at all levels using pilot programs.

Respondent 14: Keyboarding is vital for our students to be successful in the 21st century. These skills are needed in the workforce to lessen injuries, and cut frustration levels when working with computers.

Respondent 15: Should start students keyboarding at least by 3rd grade. At this grade level students should be able to handle finger dexterity. Schools can incorporate keyboarding skills through computer games.

Respondent 16: We live in a technological society and it is imperative for students to learn keyboarding skills and its significance. More students are
considering computer careers so keyboarding skills are essential.

Respondent 17: Provide adequate equipment and keep equipment updated.

Respondent 18: Start keyboarding at the elementary level.

Respondent 19: Offer keyboarding classes in all middle schools.

Respondent 20: Teach students early and conduct additional research on keyboarding.

Respondent 21: Proper keyboarding skills support the other objectives in technology in education, such as writing, math, communication and presentations.

Respondent 22: Begin keyboarding skills as early as 2nd grade. Provide funding to each school for keyboarding skills.

Respondent 23: Keyboarding should be a required core course because it is a skill everyone should have. Computers influence the workplace, culture, and business. Therefore, having a skill like a keyboarding class can certainly impact your marketability to get a job in today's market.

Respondent 24: Make keyboarding a core subject, because it will enhance their skills and promote career opportunities. Enhance reading, writing, research, communication and basic grammar skills.

6. How do you feel about your involvement in this research study?

Respondent 1: Excellent study regarding keyboarding perceptions of teachers. Glad to be involved in such a study.

Respondent 2: A great research project and I hope it will increase awareness.

Respondent 3: In favor of this research study because I strongly believe students need keyboarding skills. These skills are necessary because computers are everywhere. This research is necessary and I hope it's not put on a shelf and be forgotten.

Respondent 4: Due to the fact that I am a middle school keyboarding teacher my answers are based on observations in which I believe my input would help validate such a study on students' keyboarding skills.

Respondent 5: Positive feelings about this study. Overall awareness to the district regarding keyboarding skills of students should be noted.

Respondent 6: Good. I feel this study is important and I hope it has some impact with
the district.

Respondent 7: It's an effective study because more professional opinions are noted and will be heard. Hope the district will do something about its keyboarding skills policy.

Respondent 8: No feelings, willing to help.

Respondent 9: As an educator, I am committed to promoting business technology for elementary, middle and high school. I have enjoyed participating in this research project.

Respondent 10: Glad to assist in anyway that I can. I found this type of research needed.

Respondent 11: Very positive and appreciate being involved. Hope the research will have an impact with the district.

Respondent 12: Hopefully, my participation was helpful.

Respondent 13: Glad to help. It is teachers that need to impress upon the administration about the importance of keyboarding. This is something the district needs to implement.

Respondent 14: Very important and necessary study, awesome!

Respondent 15: Interesting study that has opened my eyes to things, especially that students should learn keyboarding at an earlier age, such as 3rd grade.

Respondent 16: Hope my insight is helpful.

Respondent 17: This study has provided me with information to think about regarding keyboarding in the future.

Respondent 18: Positive insight from research participation. Hope my voice helps.

Respondent 19: Glad to be of help.

Respondent 20: Neutral- I find the study to be useful and hope it has an impact.

Respondent 21: Helpful and needs to addressed by the district.

Respondent 22: Proud to know my opinion was heard.

Respondent 23: None.

Respondent 24: I feel great about my involvement in this research study. I think it is an
excellent research study that needs to be embraced by districts.

7. What would you recommend for future research on the timeliness of keyboarding skills for students?

Respondent 1: Start students with keyboarding skills earlier, possibly as soon as they are ready to work with computers.

Respondent 2: The district should conduct other studies and seriously look at the results of this study to make curriculum changes regarding keyboarding.

Respondent 3: Research should be done to compare students with keyboarding skills with those students without keyboarding skills and make a comparison of their writing skills on the FCAT.

Respondent 4: Conduct a study at the elementary level on keyboarding skills.

Respondent 5: Keyboarding programs that promote reading and critical thinking skills.

Respondent 6: Develop a unified keyboarding curriculum to be utilized across the district.

Respondent 7: Conduct other research studies to find out and stay on top of the necessity and the importance of keyboarding skills in our schools.

Respondent 8: Conduct a research study with elementary students, starting in 3rd grade.

Respondent 9: A study showcasing our district promoting keyboarding skills and the success of our students as a result. Conduct a pilot study of elementary and high school students and their perceptions of keyboarding skills.

Respondent 10: Research study involving students, teachers, counselors and administrators and their perceptions of keyboarding skills for the future.

Respondent 11: Additional research on the timeliness of keyboarding skills for students throughout the state.

Respondent 12: Assess the needs of the community and business organizations of skills needed by students for the future work force.

Respondent 13: Take a look at other states and evaluate how they have implemented keyboarding in their curriculums. Conduct a comparative study of the states that require keyboarding and how students have improved in other academic subjects.
Respondent 14: Start keyboarding skills earlier, like around fourth grade. By sixth grade students need to have intermediate to advanced skills.

Respondent 15: Conduct a pilot study at the elementary level.

Respondent 16: Which is the best way to teach keyboarding?

Respondent 17: A group study of kids with keyboarding skills compared with no keyboarding skills and how it affects them across the curriculum.

Respondent 18: Assess keyboarding curriculum for further research.

Respondent 19: How keyboarding skills help develop basic computer skills, which can be the foundation for future computer studies and understanding of how computers are vital to the business world, as well as school.

Respondent 20: Show a correlation between other districts and their keyboarding policies.

Respondent 21: Institute pilot keyboarding programs in the schools that don't presently have them, and measure how students improve on FCAT writing test using computers.

Respondent 22: Survey the students; get their opinions about making keyboarding mandatory. Survey the district.

Respondent 23: Nothing.

Respondent 24: A research study should be conducted at the elementary level on implementing keyboarding classes at the 3rd or 4th grade.