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Restructuring a Secondary Business Curriculum for the 21st Century

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Restructuring a Secondary Business Curriculum for the 21st Century

Abstract

This paper reviews what secondary business educators can do to restructure a business curriculum for the 21st century and how they can do it effectively. It was written to describe today's workplace, the skills that employers are expecting workers to have, the current trends and reform evolving in high school business education, and the projects, strategies, and tools that can be used by business teachers to prepare students for success in the workplace. The literature review discusses the state of Iowa's 21st century skills curriculum that was established in recent years. The skills curriculum includes employability skills, financial literacy, health literacy, and technology literacy. National business education standards are outlined and one strand of Iowa's Core Curriculum, Information Technology Standards is discussed. The paper describes how a curriculum such as information technology can be restructured to meet standards and help students develop effective employee skills. One Iowa high school's business curriculum is presented in the paper. This demonstrates what courses students can be offered, what they are taught in these courses, and how they are taught. This curriculum focuses on student learning and helps prepare them for a career pathway in an area such as information technology. The paper examines technologies being used by business educators, and how these and other strategies can be used effectively in the classroom that can be a part of the restructuring process and better prepare students for today's workplace.

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RESTRICTURING A SECONDARY BUSINESS CURRICULUM
FOR THE 21ST CENTURY

A Graduate Review
Submitted to the
Division of Instructional Technology
Department of Curriculum and Instruction
In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

By
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Degree of Master of Arts in Education.

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ABSTRACT

This paper reviews what secondary business educators can do to restructure a business curriculum for the 21st century and how they can do it effectively. It was written to describe today's workplace, the skills that employers are expecting workers to have, the current trends and reform evolving in high school business education, and the projects, strategies, and tools that can be used by business teachers to prepare students for success in the workplace. The literature review discusses the state of Iowa's 21st century skills curriculum that was established in recent years. The skills curriculum includes employability skills, financial literacy, health literacy, and technology literacy. National business education standards are outlined and one strand of Iowa's Core Curriculum, Information Technology Standards is discussed. The paper describes how a curriculum such as information technology can be restructured to meet standards and help students develop effective employee skills. One Iowa high school's business curriculum is presented in the paper. This demonstrates what courses students can be offered, what they are taught in these courses, and how they are taught. This curriculum focuses on student learning and helps prepare them for a career pathway in an area such as information technology. The paper examines technologies being used by business educators, and how these and other strategies can be used effectively in the classroom that can be a part of the restructuring process and better prepare students for today's workplace.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>METHODOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>ANALYSIS AND DISCUSSION</td>
<td>4</td>
</tr>
<tr>
<td>The 21\textsuperscript{st} Century Workplace</td>
<td>4</td>
</tr>
<tr>
<td>Digital-Age Economy</td>
<td>4</td>
</tr>
<tr>
<td>Industries and Technology</td>
<td>5</td>
</tr>
<tr>
<td>Employers and Employees</td>
<td>6</td>
</tr>
<tr>
<td>Partnership for 21st Century Skills</td>
<td>6</td>
</tr>
<tr>
<td>Learning and Innovation Skills</td>
<td>7</td>
</tr>
<tr>
<td>Information, Media, and Technology Skills</td>
<td>8</td>
</tr>
<tr>
<td>Life and Career Skills</td>
<td>9</td>
</tr>
<tr>
<td>Iowa's 21st Century Skills</td>
<td>10</td>
</tr>
<tr>
<td>High School Business Education in the 21\textsuperscript{st} Century</td>
<td>12</td>
</tr>
<tr>
<td>Career and Technical Education</td>
<td>12</td>
</tr>
<tr>
<td>High School Business Education Reform and Trends</td>
<td>13</td>
</tr>
<tr>
<td>National Business Education Standards</td>
<td>16</td>
</tr>
<tr>
<td>Iowa Core Curriculum Information Technology Literacy Standards</td>
<td>19</td>
</tr>
<tr>
<td>Curriculum Model: Bettendorf High School</td>
<td>20</td>
</tr>
<tr>
<td>Other Projects, Strategies, and Tools</td>
<td>25</td>
</tr>
<tr>
<td>Web 2.0</td>
<td>25</td>
</tr>
<tr>
<td>Personal Digital Assistants (PDAs)</td>
<td>27</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>31</td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>35</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>36</td>
</tr>
</tbody>
</table>
INTRODUCTION

The purpose of this literature review is to document how secondary business educators can better prepare students for the 21st century workplace by examining business trends, business education standards, and then describing how these educators can restructure the curriculum through the use of technologies and other strategies to meet industry needs and business education standards. According to the U.S. Department of Labor, by 2014 more than 23 percent of the employment needs fall within the business area (Mahinda, 2006).

Mahinda (2006) states “how businesses do business has been directly related to technological advances of information/data processing and business education’s response” (p. 17). The results of the review can help secondary business teachers know how to restructure a business curriculum and prepare students to find employment and/or continue studying at a postsecondary school. It is from these findings that educators can gain a better understanding and prepare students to be successful in the workplace. The paper discusses what technologies are currently being integrated effectively in to secondary business education (information technology) classes, and how these technologies can give students the skills they need for a postsecondary school and the workplace.

This literature review seeks to answer the following questions:

1. What does the workplace look like in the 21st century?
2. What skills do employers expect new employees to possess?
3. What are the business education standards in the 21st century?
4. What reform is taking shape in today's business education curriculum, particularly in the area of information technology?

5. What should be taught in a business education (information technology) curriculum and how should it be taught?
METHODOLOGY

In researching the topic, the author used many valuable resources. A combination of online databases and books were used. Online databases included Google Scholar, EBSCO, ERIC, and WilsonWeb. The University of Northern Iowa Rod Library’s website was a good starting point for conducting the research. The articles from the online databases were analyzed either digitally or as printed hard copies and were selected based on accessibility and the author’s previous experiences using the sources. The author’s past involvement in a professional organization, National Business Education Association, provided access to some of the resources used in the research. The information obtained for this paper was evaluated based on the relevance to the topic, the quality of the content, and the year each article was written.

The information gathered is relevant because it depicts how businesses are changing, tells what skills are necessary to have in today’s workplace, and helps paint a picture for business educators on how to restructure a business curriculum so they know what to teach and how to teach it so students can be well-prepared. The quality of research was obtained from education and business online journals. These are recognized journals in the business and education fields. The research articles were chosen on one hand because of the relevancy, showing many relationships between business and education and the skills required, and for the recency, having been written over the last eight years, from 2000-2008.
ANALYSIS AND DISCUSSION

The 21st Century Workplace

Digital-Age Economy

There are many changes taking place in today's workplace. Technology is continually changing and businesses are expecting their employees to have the necessary skills to compete in what is called a digital-age economy (Burkhardt, Monsour, Valdez, Gunn, Dawson, & Lernke, 2003). Burkhardt, et al. wrote that experts at the U.S. Department of Labor suggest, "We are living in a new economy—powered by technology, fueled by information, and driven by knowledge" (p. 8). The impact of computers has led to changes in the workplace. Olson (2006) wrote that routine tasks have been handled by computers. The upper-end jobs require extensive skills, workers who, including teachers, are using computers to increase their productivity (Olson, 2006).

Technology has allowed today's businesses to cut costs and increase productivity. Burkhardt et al. (2003) wrote that e-commerce and Internet business solutions have provided a cost savings of $155.2 billion to U.S. organizations, according to the U.S. Department of Commerce. In a digital-age economy, skills in information technology can lead to higher wages (Burkhardt et al., 2003). In both the information technology and non-information technology fields, analysts suggest technologically-skilled workers are likely to earn more wages than those without these skills (Burkhardt et al., 2003).

According to the U.S. Department of Labor, U.S. service industry (including business) employment is expected to increase from 146 million to 168 million, between 2000 and 2010 (Conlon, 2004). This gives business educators the opportunity to prepare students to work in these and other profession fields that require technology skills.
Industries and Technology

Business education programs are organized to prepare students for careers in many industries (Mahinda, 2006). There are many industries using technology to help increase productivity in the 21st century (Kilcoyne & Redmann, 2006). According to Kilcoyne and Redmann (2006), administrative support jobs have especially been modified today, due to the increase of globalization, emerging technology, and flattening organizational hierarchy. Administrative support workers are now expected to complete many tasks, using many forms of technology such as using e-mail, the Internet, computer networks, voicemail, desktop publishing, word processing, databases, and spreadsheets (Kilcoyne & Redmann, 2006). In agriculture, Thomas (2007) states that farmers are more reliant on using computers and the Internet to monitor diseases that threaten livestock as well as keep track of farm records, which can save time, money, and paperwork. A GPS system, or global positioning system, is another technology used by farmers to save on costs of chemical application of crops (Thomas, 2007). It allows them to record location and determine how much is needed in various locations of the fields (Thomas, 2007).

The newspaper industry is using more technology now to increase revenues in various ways. Employees use computer software to associate data from the advertising section to the circulation department (Thomas, 2007). Employees can evaluate the data collected to determine opportunities that can increase sales for the newspaper. Software can also be used to combine all aspects of a company’s data in the areas including human resources, payroll, and production (Thomas, 2007). The trucking industry has been using GPS systems to track where trucks are traveling. Truckers can report to their central office through onboard computers (Thomas, 2007). The automobile industry has been
installing computer chips in the components so that cars can be diagnosed and repaired by mechanics in an effective manner (Thomas, 2007).

Employers and Employees

Businesses are developing strategies to recruit talented employees who can make a difference and help them be successful, and finding ways to retain these employees (Aselstine & Alletson, 2006). Recruiters have had to compete with employee mobility over the last several years, and there have been challenges keeping the right talent. The mobility is because employees feel they need to change jobs in order to secure salary growth and career advancement. They seek other job opportunities if their current jobs do not develop the skills they want to be marketable (Aselstine & Alletson, 2006).

According to Kilcoyne and Redmann (2006), today's employers are not satisfied with the skills of workers hired to fill open positions. Employers have raised concerns about office workers being hired without the proper skills (Kilcoyne & Redmann, 2006). This puts added pressure on the educational institutions to prepare graduates with the right skills they need to be effective and contribute productively in the workplace.

In the workplace, the employer-employee role is a partnership (Conlon, 2004). In this relationship, employers give their employees opportunities for career development. The employees then become responsible for career development by improving their skills for a personal career plan that fits in the company's plan. Many employers are requiring additional competencies, not only the basic skills (Conlon, 2004).

Partnership for 21st Century Skills

So how can our educational system better prepare students to answer the needs of today's corporations? It begins with reconstructing the curriculum to teach the skills that
are necessary for today's world. Before curriculum can be modified, the skills need to be identified and that begins with the Partnership for 21st Century Skills. This is an agreement between education, business, and government leaders, which was formed to address the needs and challenges of 21st century learning (Leh, Kouba, & Davis, 2005). The Partnership's framework focuses on four themes that are relevant to modern life (Partnership for 21st Century Skills, 2007):

- Global awareness
- Financial, economic, and entrepreneurial literacy
- Civic literacy and
- Health literacy (p. 9)

Students who learn in situations using these interdisciplinary themes can become better prepared for the demands of adult life because they relate to real life issues and increase student motivation and enhance learning (Partnership, 2007).

"Without 21st century skills, students are being prepared to succeed in yesterday's world – not tomorrow's" (Burkhardt et al., 2003, p. 2). What skills do students need to be well prepared in today's workplace? The Partnership provides business teachers guidance for restructuring the curriculum knowing the skills students must learn and use them as a foundation for teaching.

**Learning and Innovation Skills**

Mahinda (2006) believes that preparing students for the free enterprise global marketplace requires students to be creative and innovative. According to the Partnership (2007), learning and innovation skills facilitate the mastery of other skills. Learning and innovation skills consist of critical thinking and problem-solving, creativity and
innovation, and communication and collaboration. The Partnership defines critical thinking as “the capacity of active investigative thinking” (p. 12). It is a skill that can be taught, practiced, and mastered, and builds on other skills such as information literacy and communication, in that it allows learners to examine, analyze, and interpret, and evaluate information (Partnership, 2007). Problem-solving occurs when learners apply learning and innovation skills to an area of inquiry. Individuals who are creative can develop new ideas and gain new insights, and those who are innovative can build on practical expertise. Since communication and collaboration entails explanation, negotiation, and working with others; jobs that require these skills are not likely to be replaced by automation (Partnership, 2007).

Information, Media, and Technology Skills

Mahinda (2006) believes that preparing students for the free enterprise global marketplace requires a way and means for students to have an understanding of basic business concepts and technology to achieve their goals. The Partnership (2007) states that technical information has increased considerably and acknowledges that the promotion of information literacy is important. Information literacy demands learners to 1) “access information efficiently and effectively, 2) evaluate information critically and competently, and 3) use information accurately and creatively” (p. 18). Although today’s learners are surrounded by so many technological devices and speak technology with great fluency, they are not as competent using the technology as educators and parents would like (Partnership, 2007). For example, students who use the Internet may access inaccurate information that is inappropriate for a particular topic, or plagiarize by copying and pasting information to a report and saying it’s their own work. According to
the Partnership (2007), students who are information literate have the ability to “give meaning and value to the facts, figures, messages, and texts that fill our lives” (p. 19).

Students today are surrounded by an overwhelming quantity of messages shared by broadcast media (Partnership, 2007). The Partnership suggests that students need to develop media literacy as well. Media literacy curriculum “provides a framework to access, analyze, evaluate, and create messages in a variety of forms, builds an understanding of the role of media in society, as well as essential skills of inquiry and self-expression necessary for citizens of a democracy” (p. 19). If a student is media-literate, he or she uses the process skills of awareness, analysis, reflection, and action to better understand the media messages. Media literacy also allows students to create messages for self-expression and to influence and inform those around them (Partnership, 2007).

Life and Career Skills

The Partnership (2007) identifies five important life and career skills that students should master:

- Flexibility and adaptability
- Initiative and self-direction
- Social and cross-cultural skills
- Productivity and accountability
- Leadership and responsibility. (p. 21)

The Partnership (2007) states that:

...academic and cognitive skills are not the only employee skills needed to be successful in today’s workplace. In our global technological age, young people
also need to work with and learn from diverse groups, be flexible in a variety of work and social settings, and be adaptable to changing times...need to demonstrate leadership and take responsibility for results, show initiative and resourcefulness, and be productive and accountable for their actions. (p. 21)

The skills listed above are also called soft or applied skills (Partnership, 2007). Wilhelm, Logan, Smith, and Szul (2002) define soft skills as “non-technical skills, abilities, and traits required to function in a specific employment environment” (p. 44). Soft skills are essential in the workplace because they enable employees to work in teams and present their work verbally (Partnership, 2007). According to the Partnership (2007), one survey revealed that these life and career skills were rated as the most important skills necessary to have in the workplace.

Iowa’s 21st Century Skills

In 2007, a team of experts, which included educators, business, and industry representatives from the state of Iowa, established their own 21st century skills that included employability skills, financial literacy, health literacy, and technology literacy (Iowa Department of Education, 2008). These skills were developed by combining common elements found in literature, such as the Framework for 21st Century Learning and the Partnership for 21st Century Skills (Iowa Department of Education, 2008).

This section focuses on two of Iowa’s 21st century skills: employability and technology literacy. These skill sets are the most relevant to business curriculum.

The Employability skill set defines standards that expect workers to (Iowa Department of Education, 2008):
1. Communicate and work productively with others, increase innovation and quality of work

2. Adapt to various roles and responsibilities and be flexible in your work

3. Demonstrate leadership skills, integrity, social responsibility, and ethical behavior while collaborating to meet common goals

4. Demonstrate initiative and self-direction through high achievement and lifelong learning while exploring ways talents and skills of an individual can be used to be productive in personal and professional life

5. Demonstrate accountability and productivity by achieving high expectations.

(p. 21)

Technology literacy is a skill workers should have before entering the workplace. According to the Iowa Department of Education (2008), technology literacy expects workers to be able to:

1. Construct knowledge, demonstrate creative thinking, and develop innovative products and processes using technology

2. Use digital media to communicate and work collaboratively

3. Apply digital tools to gather, evaluate, and use information

4. Exhibit critical thinking skills by using tools and resources to plan and research, solve problems, manage projects, and make educated decisions

5. Recognize human, societal, and cultural issues related to technology, and practice ethical and legal behavior

6. Show you understand technology concepts, systems, and operations. (p. 20)
These skills inform business educators as to what employers are looking for in their workers and they can also create a path for teachers in the restructuring process. A business curriculum can be restructured to engage students in activities that develop these skills. In the sections to follow, it explains what a business education curriculum in this century looks like, reform that is taking place, and the business education standards. These standards are being used to create a framework for restructuring a high school business education curriculum.

High School Business Education in the 21st Century

There are many technologies being used in the secondary business education curriculum because of the increasing need for students to be proficient in using technologies in business in order to increase productivity and remain competitive (Rader, 2003). Reform is taking place in high school business education, also known as career and technical education (Rader, 2003). The following section outlines what career and technical education is, and what areas are taught with a focus on the state of Iowa. The focus moves to one area of career and technical education, Business and Information Technology, and then follows with details of what should be taught in Business and Information Technology, more specifically in Information Technology.

Career and Technical Education

In the state of Iowa, career and technical education connect careers and education in the following areas (Iowa Department of Education, 2008):

- Agriculture Education
- Business and Information Technology (topic of discussion in this paper)
- Family and Consumer Sciences Education
• Health Occupations Education
• Industrial Technology Education and
• Marketing Education. (p. 1)

According to the Iowa Department of Education (2008):

Business and information technology prepares students to master knowledge and skills needed to function as citizens, consumers, employees, managers, business owners, and directors of their economic futures through the study of accounting, business law, career development, communication, computation, economics, personal finance, entrepreneurship, information technology, international business, management, and marketing. (p. 1)

It is a fact that information technology is a part of business education (Iowa Department of Education, 2008).

High School Business Education Reform and Trends

There are several factors that have led to a reform in high school business education. Lynch (2000) suggests these factors include: a new economy, public expectations for students, new research on student learning, motivation and effective teaching, and a demand for reform in the American high school. Lynch (2000) states that the new economy involves more international activity, cyberspace, market demands and standards, and sophisticated computers.

In a global economy, the United States, in particular, is lagging behind such countries as China and India, when it comes to maintaining a competitive workforce (Fletcher, 2006). The first step, according to Fletcher (2006), is to make sure the United States has enough professional scientists, engineers, and entrepreneurs to continue to be a
world leader in innovation. In order to remain competitive, students must also remain interested in school and stay in school. States are enforcing schools to use more technologies in education so teachers can engage more students in the learning process (Fletcher, 2006).

Businesses want business educators to prepare students with employee skills and parents expect their children to attend college, according to Lynch (2000). To meet these expectations, high school business educators have the opportunity to prepare students with these skills before entering the workplace. A major area of focus in business education is on information technology (National Business Education Association, 2008).

According to McEwen (2008), business teachers are surrounded by electronic things and, as a result, it is their obligation to use technologies to reach students and to motivate them to learn. He also suggests that it is important for teachers to instruct students in how to use technologies as well as learn themselves how to use technologies as effective educational tools for teaching.

Business educators have realized the importance of responding to the needs of businesses and that business school programs must be modified to reflect changes in the business setting (Brody & Coulter, 2002). Time and money are constant concerns educators have in their challenging profession (Wynn, 2008). In business education using technology, time and money are very important, especially when teachers are developing and enhancing their curricula. Making resources available to students so they can use them in developing their skills will prepare them for college and eventually the workplace. Wynn explains in his article that Indiana is one state that has a well-organized technology education curriculum model that was created by the Indiana Department of
Education’s Technology Education Curriculum Committee. By modeling after this curriculum, technology teachers could use it in their own classes, and enhance them through the use of their resources (Wynn, 2008). The challenge for educators, especially in business education, is to stay ahead of technological trends and to select useful and user-friendly products that can be used in the classroom, and to make the most of their opportunities.

In secondary business education, Rader (2003) states that business educators “facilitate learning in a student-centered environment… [where] learning is customized: students select projects based on personal and career interests” (p. 37). One of the new trends is encouraging students to select unstructured projects, work independently or in teams, and use a wide range of technologies to solve problems (Rader, 2003). There is a growing interest in computers and technology, and there are program improvements, business-education partnerships, and an increased demand for employment skills (Rader, 2003).

Changes in computer technology have also affected the business education curriculum (Rader, 2003). The computer has changed what business educators teach and how they teach it (Rader, 2003). As technology changes, more courses are being offered in high schools (Rader, 2003). Technology features such as faster processors, self-paced tutorials, and user-friendly software are just some of the changes (Rader, 2003). These changes allow students to access information faster and give teachers a chance to add more classes to their business education curriculum (Rader, 2003).

Some state standards have directed the reconceptualization of business curriculum which requires schools to offer more business courses, especially in information
technology. Indiana and several other states have changed their standards to force schools to offer more courses in computer technology which include keyboarding and document formatting, computer applications, and advanced computer applications classes in database management, desktop publishing, web page design, networking and systems management, and programming (Rader, 2003).

National Business Education Standards

To better understand why a business education curriculum needs to be restructured for the 21st century, business educators must first understand the standards. According to the National Business Education Association (2008), the National Standards for Business Education are what students should know and be able to do in business, and cover the areas of:

- Accounting
- Business Law
- Career Development
- Communication
- Computation
- Economics and Personal Finance
- Entrepreneurship
- Information Technology
- International Business
- Management
- Marketing. (p. 1)
These standards require business teachers to introduce their students to personal finance, wise consumer decision-making techniques, the economic principles of a growing global marketplace, and the ways by which businesses operate (National Business Education Association, 2008).

According to the National Business Education Association (2008), business education competencies are essential for all business students. The NBEA defines these competencies as:

- All students participate in the economic system, therefore, they all need to be literate in business and economics
- All students encounter a business environment that is domestically and internationally diverse, therefore, they all need to practice their interpersonal, leadership, and teamwork skills that can help them to work successfully in that environment
- All students use technology as a tool for information management, therefore, all students need to perfect their lifelong learning skills that promote career paths and give them the confidence to adjust in a workplace that requires constant retooling
- Technology has accelerated the frequency of change and rate in business and life. Work and life activities have a tendency to overlap and, as a result, require decision-making to be more sophisticated. (p. 1)

While each of these sets of competencies is important, Information Technology will be further explored throughout this review. The literature review addresses this curriculum
area in detail to give the reader a better understanding as to what should be taught and how it should be taught.

According to the National Business Education Association (2008):

Information technology permeates our society and our entire educational system. More than just a series of courses, information technology is an information-gathering, information-organizing, and problem-solving tool that supports every discipline. To help students during their school years as well as during their employment, business education must offer continuous instruction in current and emerging information technology. (p. 1)

The Standards for Information Technology are listed below (National Business Education Association, 2008). Full descriptions of each standard are in Appendix A:

- Impact on society
- Computer architecture
- Operating systems, environments, and utilities
- Information technology and major business functions
- Application software
- Input technologies
- Information retrieval
- Database management systems
- Programming and application development
- Systems analysis and design
- Communications and networking infrastructures
- Network applications
• Information technology planning and acquisition
• Technical support and training
• Risk management
• Privacy and ethics
• Information technology careers. (p. 1)

The following section examines how Iowa educators developed their own standards in the area of Information Technology. This identifies standards that Iowa business teachers will use to restructure an Information Technology curriculum that meets those standards and helps them to develop the students’ skills they need.

_Iowa Core Curriculum Information Technology Literacy Standards_

The Iowa Core Curriculum, also known as Model Core Curriculum, was created to give every student in Iowa an education that enables him or her to succeed in a technology-rich and global economy (Iowa Department of Education, 2008). It encourages teachers to focus on well-researched concepts and skills in the areas of literacy, math, science, social studies and 21st century learning skills (Iowa Department of Education, 2008). The focus in this section is on the Information Technology strand of the Iowa Core Curriculum and the activities that help meet those standards. These standards, known as Iowa Core Curriculum Information Technology Literacy Standards, highlight one of Iowa’s 21st century skills, technology literacy, which was discussed earlier. A business education curriculum, such as Information Technology, can be restructured to include activities that meet the standards and prepare the students with the right skills, in this case, technology literacy. These activities (See Appendix B) are research-based and there are many other activities that may work better in certain
learning situations (Iowa Department of Education, 2008). Below are the six standards, also called Essential Concept Technology Literacy Standards:

1. Creativity and innovation  
2. Communication and collaboration  
3. Apply digital tools  
4. Critical-thinking, problem-solving, and decision-making  
5. Recognize human, societal, and cultural issues related to technology (digital citizenship)  
6. Technology operations and concepts. (p. 20)

Curriculum Model: Bettendorf High School

To better understand an information technology curriculum it is useful to examine a current school’s curriculum model. The curriculum model of Bettendorf High School in Bettendorf, Iowa, focuses on the information technology courses taught, descriptions of the courses, and a sequence of the courses.

Bettendorf High School (2008) developed a mission statement for their business education department stating that:

The content area of business education provides a foundation for success for all students, no matter what their ultimate goals in life may be...business education curriculum is not only valuable for all students in today’s world, but also is critical to the success of this country...all students need to have a general understanding of how the American economy operates and the role business plays in the economic well-being of this country. (p. 19)
So what should a business curriculum include in today's school? First, it is important to have a curriculum based around the business education standards. Bettendorf High School (2008) explains that members of the National Business Education Association endorse and recommend that all students should be provided an opportunity to study the principles of business as they relate to their personal and professional lives. They suggest that business education standards guide teachers in teaching their courses and are designed to develop students' comprehensive competence (Bettendorf High School, 2008).

Secondly, the curriculum should consist of courses that meet standards and involve students in activities that develop their skills. Bettendorf High School (2008) offers the following courses in the area of Information Technology that meet standards and develop students' skills through the use of technologies:

- Computer Applications I – Word, Excel, PowerPoint, Access
- Computer Applications II – Advanced Word, Excel, PowerPoint, Access
- Computer Applications Multimedia Business (Presentations/Movie Maker)
- Web Page Design – Adobe Dreamweaver/Adobe Flash. (p. 19)

Each class is described below in detail and how each class addresses Iowa’s Core Curriculum Standards:

**Computer Applications I**

This is an introduction to computers including Windows operating system, word processing, spreadsheets/worksheets, database, presentation programs, email, the Internet, and computer-related concepts (Bettendorf High School, 2008). Students complete computer laboratory exercises using the following computer applications:
Word, PowerPoint, Excel, and Access (Bettendorf High School, 2008). This course meets the following information technology standards (Bettendorf High School, 2008):

- *Operating systems, environments, and utilities* – Students learn about the Windows operating system and how to solve problems when they occur.

- *Application software* – Students diagnose and solve problems using Microsoft Office 2003 application programs.

- *Database management systems* – Students use, plan, develop, and maintain database management systems using Microsoft Access application program.

- *Information retrieval* – Students use the Internet effectively for research and to document creation.

- *Input technologies* – Students use input technologies such as keyboards to enter and manipulate text and data.

- *Privacy and ethics* – Students write a research paper using MLA style to document references in an ethical manner. (p. 24)

*Computer Applications II*

This is an advanced course in computers including Windows operating system, word processing, spreadsheets/worksheets, database, presentation programs, email, the Internet, and computer-related concepts (Bettendorf High School, 2008). Students complete computer laboratory exercises that meet the following information technology standards (Bettendorf High School, 2008):

- *Application software* – Students diagnose and solve problems using Microsoft Office 2003 application programs.
• **Network applications** – Students gain an understanding of networks and the Internet.

• **Communications and networking infrastructures** – Students develop an understanding of networks to design and administer networks and communications systems.

• **Information technology careers** – Students create a resume and cover letter, and explore Microsoft Office Specialist Certification opportunities and requirements.

• **Input technologies** – Students use input technologies such as keyboards to enter and manipulate text and data. (p. 24)

Wilhelm et al. (2002) support the importance of introducing high school students to various careers that interest them. They mention having students create a career portfolio. Students can use word processing software to create a cover letter and resume, and then have a luncheon where business leaders, faculty, and administrators can attend (Wilhelm et al., 2002). The career luncheon gives students an opportunity to talk with potential employers and demonstrate proper dining etiquette (Wilhelm et al., 2002). Job shadowing, creating newsletters, and portfolios are other projects students can be involved with in a business curriculum (Wilhelm et al., 2002). Technology can be used in these projects, depending on its accessibility and the students’ skill levels.

*Computer Applications Multimedia*

This course has students use Microsoft PowerPoint and Microsoft Publisher XP to develop professional multimedia presentations in the XP multimedia Dell Lab.
Students complete computer laboratory exercises that meet the following information technology standards (Bettendorf High School, 2008):

- **Technical support and training** – Students diagnose and troubleshoot system problems and/or software using various resources.

- **Information technology and major business functions** – Students use technology to communicate effectively in a business setting.

- **Information planning and acquisition** – Students identify and apply principles and techniques of publication and presentation design. (p. 25)

Lazaros and Spotts (2007) explain that PowerPoint can do more than create slide presentations; the software comes with creative and powerful drawing tools. According to Lazaros and Spotts (2007), PowerPoint comes preloaded on most computers and is already available in most schools, which allows information technology educators to teach graphic design without having to spend a substantial amount of money on additional expensive software. While most schools have trouble finding the right software and coming up with the money to pay for expensive software programs, PowerPoint can provide teachers with effective ways in teaching graphic design to students (Lazaros & Spotts, 2007).

**Web Page Design**

This course has students use Adobe Dreamweaver and Adobe Flash software to design, develop, manage, and update web sites (Bettendorf High School, 2008). Students complete computer laboratory exercises that meet the following information technology standards (Bettendorf High School, 2008):
- **Systems analysis and design** – Students design and create web pages using web design tools.

- **Application software** – Students use Adobe application software to create web pages.

- **Programming and application development** – Students create web pages in Notepad using html code. (p. 26)

Wilhelm et al. (2002) support teaching web design in school. They suggest having students design and create web pages. Students would use their technical skills in creating the web page and teamwork and communication skills in working with their peers. This is a good opportunity for students' work to be noticed, by posting the web pages on the Internet so the business community, administrators, parents, and faculty can see them (Wilhelm et al., 2002). This would allow students to show their creativity and innovation by creating web pages from scratch.

**Other Projects, Strategies, and Tools**

**Web 2.0**

Oliver (2007) describes Web 2.0 as “an umbrella term for many individual tools that have been created with web collaboration, sharing, and/or new information creation in mind” (p. 55). Oliver (2007) states Web 2.0 includes popular tools used in education such as blogs and wikis. Blogging allows students to post reflections and reports, and then allows teachers, other students, and parents to give feedback by posting comments to their individual blogs. Although blogging may not be required by employers in the workplace, it develops students' writing skills and strengthens communication skills, a 21st century skill mentioned earlier in the paper (Oliver, 2007). Oliver explains that the
advantages Web 2.0 offers in education are that it introduces students to software tools such as multimedia/hypermedia and audio/video production tools, gives students practice in using the Internet to collaborate and write, is a no cost or low cost tool for teachers to use in their classrooms, and allows teachers to gain experience using technology without purchasing expensive software. Business educators can use internet-based tools to assist students in achieving course goals that engage them in learning (Gaytan, 2008). Creating blogs and wikis in information technology courses allow instructors and students to work collaboratively on projects. Students can engage in dynamic, interactive discussions on various topics (Gaytan, 2008). According to Bisoux (2008), "The wiki is such a dynamic web site and data storage tool. Wikis help students in three areas crucial to starting a business: internal project management, operational efficiency, and web site design" (p. 28). Wikis allow students to create and collaborate on a web page about a topic of study and can update the content at any time (Oliver, 2007).

Podcasting, another Web 2.0 technology, is gaining popularity in today’s society and is spreading its use into the educational environment (Lee, McLoughlin, & Chan, 2008). Frydenberg and Davi (2006) define a podcast as “an audio or video file distributed to an appropriate media player over the Internet” (p. 4). With its widespread popularity, business educators can use podcasting in their classrooms. In information technology class, podcasting is used to download lectures from class so students can listen to them if they were absent. Information technology students use podcasting as a tool to create audio or video files to demonstrate key concepts they’ve learned (Frydenberg & Davi, 2006). Students can record their voices and upload these audio files to the server to be listened to on a web site (2006).
Schools are giving their students the opportunity to use wireless technologies, such as handheld computers, also known as PDAs (personal digital assistants) to simulate business situations. According to Kim, Holmes, and Mims (2005), PDAs are the most frequently-used mobile device in schools. A hand-held computer is an example of ubiquitous computing, and many educators have found there are benefits to using handhelds (Leh et al., 2005). These benefits include:

- Improved quality of instruction
- Enhanced student communication and collaboration
- Improved student organizational skills
- Enhanced student motivation
- Promotion of student autonomous learning. (p. 243)

PDAs are also portable and affordable to purchase for use in education (Leh et al., 2005). Another reason students should use handheld computers in schools is because they are being extensively used in the business world (Leh et al., 2005). Since hand-helds are frequently being used in businesses, students can use them in schools for practice so they are prepared for the workplace.

PDAs are being taught and used in business education and information technology curricula (Switzer & Csapo, 2005). Switzer and Csapo found that using PDAs in business courses increased student motivation for learning and worked as effective tools for encouraging teamwork and information sharing among students. As noted earlier, teamwork and communication, or information sharing, are important skills to have in today’s workplace.
Frydenberg and Davi (2006) report that students in an information technology course used PDAs instead of printed textbooks to learn about technology. They completed learning exercises that demonstrated the need to apply technology in real-world situations. Students were able to develop critical-thinking, problem-solving, and writing skills through the use of PDAs. These skills are also important to have in today's workplace.
CONCLUSIONS AND RECOMMENDATIONS

In the 21st century, businesses have changed to such an extent that they require employees to have specialized skills to remain competitive. These 21st century skills have placed secondary business educators in an influential position. They must teach these skills and integrate activities into the curriculum so that students are well prepared to enter a postsecondary school and eventually the workplace. Restructuring a business curriculum is a proactive approach to preparing students with the right skills. A glimpse of an Iowa school’s business curriculum is a good starting point for the business education restructuring process. By reviewing the information technology courses that are taught, the activities that occur in the courses, and how the teachers meet the standards, it can paint a picture of how a curriculum can be restructured. Newest technologies should be taught and business educators should use them in their classes. Other business educators can follow suit and restructure a curriculum to meet employer expectations based on this research.

Future research should be done on how other industries are using technology in the workplace. It was difficult searching for articles covering such several overlapping areas such as business education and technology, for example. It seemed that there were not many articles found covering these specific areas, among other similar search words. The author, however, found much research on technology and education, or similar search words, but avoided writing about these more general topics because it did not fit the content of interest, or subject areas of business education and information technology. The research seemed to fit only core content areas such science and math, for example, in using technology in the classrooms. There was little research done on the technologies
being used in the workplace in the 21st century. More importantly, there does not appear to be much research on specific technologies being used in business education, especially in high schools. There were more articles found on business education at the college level, which made researching a little more difficult than expected. Future research should be done on technologies in the workplace and what schools can do to get money to support these technologies, so students are prepared to use them. More research will also be done on how to restructure business education to make it more student-oriented.

The landscape of today’s workplace has changed drastically due to advances in technology. With these changes come certain expectations employers have of their employees. In a digital-age economy, businesses are requiring workers to possess 21st century skills. The Partnership for 21st Century Skills, which includes learning and innovation, information, media, and technology, and life and career skills, can guide business educators in meeting these expectations. A way business educators can prepare students with the right skills for the 21st century workplace is to restructure the business (information technology) curriculum. Business educators should align the curriculum with national business education standards established by the National Business Education Association. Courses in information technology should be offered such as computer applications, multimedia, and web page design to help students develop employee skills. Business educators should use projects, strategies, and tools to teach their students how to be productive, efficient, and innovative people. Students can develop these and other employee skills by learning how to use wikis, blogs, podcasts, and personal digital assistants.
REFERENCES


## APPENDIX A (National Business Education Association, 2008, p. 1)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on society</td>
<td>Assess the impact of information technology on society.</td>
</tr>
<tr>
<td>Computer architecture</td>
<td>Describe current and emerging computer architecture; configure, install, and upgrade hardware; diagnose and repair hardware problems.</td>
</tr>
<tr>
<td>Operating systems, environments, and utilities</td>
<td>Identify, evaluate, select, install, use, upgrade, customize, and diagnose and solve problems with various types of operating systems, environments, and utilities.</td>
</tr>
<tr>
<td>Information technology and major business functions</td>
<td>Describe the information technology components of major business functions and explain their interrelationships.</td>
</tr>
<tr>
<td>Application software</td>
<td>Identify, evaluate, select, install, use, upgrade, and customize application software; diagnose and solve problems resulting from an application software's installation and use.</td>
</tr>
<tr>
<td>Input technologies</td>
<td>Use input technologies appropriately to enter and manipulate text and data, software's installation and use.</td>
</tr>
<tr>
<td>Information retrieval</td>
<td>Gather, evaluate, use, and cite information from information technology sources.</td>
</tr>
<tr>
<td>Database management systems</td>
<td>Use, plan, develop, and maintain database management systems.</td>
</tr>
<tr>
<td>Programming and application development</td>
<td>Design, develop, test, and implement programs.</td>
</tr>
<tr>
<td>Systems analysis and design</td>
<td>Analyze and design information systems using appropriate development tools.</td>
</tr>
<tr>
<td>Communications and networking infrastructures</td>
<td>Develop the skills to design, deploy, and administer networks and communications systems.</td>
</tr>
<tr>
<td>Network applications</td>
<td>Use, evaluate, and deploy communications and networking applications.</td>
</tr>
<tr>
<td>Information technology planning and acquisition</td>
<td>Plan the selection and acquisition of information technologies.</td>
</tr>
<tr>
<td>Technical support and training</td>
<td>Develop the technical and interpersonal skills and knowledge to support the user community.</td>
</tr>
<tr>
<td>Risk management</td>
<td>Design and implement risk management policies and procedures for information technology.</td>
</tr>
<tr>
<td>Privacy and ethics</td>
<td>Describe, analyze, develop, and follow policies for managing privacy and ethical issues in organizations and in a technology-based society.</td>
</tr>
<tr>
<td>Information technology careers</td>
<td>Describe positions and career paths in information technology.</td>
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</tbody>
</table>
### APPENDIX B (Iowa Department of Education, 2008)
Iowa Core Curriculum Information Technology Literacy Standards

<table>
<thead>
<tr>
<th>Standards</th>
<th>Activities</th>
</tr>
</thead>
</table>
| Creativity and innovation     | **Background of activity:** "It is the year 2010 and energy prices have continued to skyrocket. It has become obvious, that in order to comfortably live, you and your family group need to have a plan to supply your own personal power needs. New technologies are your friend in this endeavor" (Iowa Department of Education, 2008, p. 2).  
  i. Apply existing knowledge to generate new ideas, products, or processes. Students can design, develop, create, and/or test self-generated digital learning objects that are accessible by as many users as possible and demonstrate knowledge and skills related to curriculum content.  
  ii. Create original works as a means of personal or group expression. Students can individually or in groups create media-rich products to be displayed, published, or performed for a variety of audiences.  
  iii. Use models and simulations to explore complex systems and issues. Students can employ curriculum-specific, technology-based simulations to aid them in understanding complex, real-world systems. Simulations studies include formulating problems, developing models, running models, and analyzing outputs that help predict behaviors and outcomes.  
  iv. Identify trends and forecast possibilities. Students can investigate complex global issues, make informed choices based on capabilities and limitations of technology systems, resources, and services, and apply this learning to personal and workplace needs. |
| Communication and collaboration | **Background of activity:** "Health care for you and your family has evolved in recent decades to include global interactions and options in many medical fields. X-rays are read by radiologists in countries across the world while you sleep, pacemaker patients download data from their devices by telephone, surgeons do procedures using robotic tools, diabetics report blood sugar levels to research facilities by email, etc. Telemedicine is the use of telecommunications technology for medical diagnosis and patient care when the provider and client are separated by distance" (Iowa Department of Education, 2008, p. 5).  
  i. Interact, collaborate, and publish with peers, experts or others employing a variety of digital environments and media. Students can listen to podcasts created by...
| classmates, compile digital notes over information presented. |
| ii. Communicate information and ideas effectively to multiple audiences using a variety of media and formats. Students can create a podcast to be uploaded on to a class website sharing their gathered information. |
| iii. Develop cultural understanding and global awareness by engaging with learners of other cultures. Students can use online tools and emerging technologies for communicating with and learning about people of other cultures. |
| iv. Appropriately contribute to project teams to produce original works or solve problems. Students can share knowledge and skills with local or distance teams of peers, experts, or others using technological tools and resources to create collaborative works and/or innovative sustainable solutions. |

### Apply digital tools

**Background of activity:** A group of business leaders are collectively looking to relocate their businesses to a community with a larger potential employee base. Your community wants this group to relocate to your area. You have been asked to research what types of skills they are looking for in potential employees, discover how your community can meet those needs and present your findings to a board of community members" (Iowa Department of Education, 2008, p. 9).

i. Plan strategies to guide inquiry. Students design a process which establishes criteria for selecting digital tools and resources to use for in-depth investigation of a real-world task and justify the selection based on efficiency and effectiveness. Students can develop a digital marketing campaign to attract potential employees with skills in areas of deficit to your community.

ii. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. Students model legal and ethical behaviors when using information and technology by properly selecting, acquiring, and citing resources for research, information analysis, problem-solving, and decision-making in content learning. Students can create a digital organization tool to help them in their research to discover what specific skills are required for employees in industries in the business group.

iii. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks. Students can access information efficiently and effectively,
| **Critical-thinking, problem-solving, and decision-making** | **Background of activity:** “Voters of a growing school district need to vote on what kinds of schools need to be built to accommodate future growth within the next five years. Your consulting firm has been hired by the district to research how that growth needs to be addressed to ensure equitable access to technology for all students with the increased enrollment. Your findings will be made public to help the voters make informed decisions” (Iowa Department of Education, 2008, p. 12).

  i. Identify and define authentic, real-world problems and significant questions for investigation. Students can identify global issues and analyze capabilities and limitations of current and emerging technology resources in order to develop and refine questions.

  ii. Plan and manage activities to develop a solution or complete a project. Students can use multiple technologies and resources effectively to develop a systematic plan for conducting research to assess potential sustainable solutions or to develop a complete product to demonstrate knowledge and skills.

  iii. Collect and analyze data to identify trends, solutions, or make informed decisions. Students can use technology to gather data, analyze its application to a task, and assess its effectiveness in order to design, develop, and test possible solutions that assist students to make decisions.

  iv. Use multiple processes and diverse perspectives to explore alternative solutions. Students can use multiple perspectives to analyze and evaluate information from a variety of technological resources. |

| **Recognize human, societal, and cultural issues related to technology (digital citizenship)** | **Background of activity:** “Intellectual property rights are a major issue because the Internet makes sharing information so easy” (Iowa Department of Education, 2008, p.14).

  i. Advocate and practice safe, legal, and responsible use of information and technology at an age-appropriate level. Students can use technology efficiently and in a manner that does not hurt them or others. They can make choices that demonstrate and advocate for legal and ethical... |
behaviors among others regarding the use of technology and information. Students can analyze the factors affecting the price of recorded music, they assess the importance, validity, or limitations of each factor, then determine how the cost of each could be minimized to reduce the final cost for the consumer.

ii. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity. Students can create an overview of current methods for legally obtaining music.

iii. Demonstrate personal responsibility for lifelong learning. Students can use their skills to identify capabilities and limitations of contemporary and emerging technology resources and assess the potential of these systems and services to address personal, lifelong learning, and workplace needs. They can use the knowledge to make wise decisions among technology systems, resources, and services.

iv. Exhibit leadership for digital citizenship. Students with digital leadership can adopt new technologies and make practical use of them.

<table>
<thead>
<tr>
<th>Background of activity: “Students show how they understand and use technology systems by adapting to evolving technology systems and apply them for everyday use” (Iowa Department of Education, 2008, p. 16).</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Students locate several examples of personal budgets and identify at least one positive and one negative aspect to each one. Students can select potential careers for themselves as they enter the workplace, including reasonable salaries based on where they would like to live. They use examples of budgets they located to create their own budgets based on their needs.</td>
</tr>
<tr>
<td>ii. Select and use applications effectively and productively. Students can research several careers they are interested in and report the average salary, market demand, and education requirements of each one.</td>
</tr>
<tr>
<td>iii. Troubleshoot systems and applications. Students can utilize a working knowledge of technology or technological support services to identify a problem or issue and its solution.</td>
</tr>
<tr>
<td>iv. Transfer current knowledge to learning of new technologies. Students can apply what they know of one technology to intuitively use other technologies.</td>
</tr>
</tbody>
</table>