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Smoczyk, Jeanne M. *An Analysis of Student Performance in select Online and Face-to-Face Courses in the Health Information Technology Program at Chippewa Valley Technical College*

Abstract

The purpose of this study was to determine if students enrolled in the Health Information Technology (HIT) program at Chippewa Valley Technical College (CVTC) perform any differently online as they would in a face-to-face course.

The results of this study showed overall there was no difference in an online delivery course compared to the on-campus course. With respect to the age of the student, it was discovered the 22-30 year old category performed better in a traditional course than an online course. It was also discovered there was no significant difference between the delivery methods and the students cumulative GPA. A student's cumulative GPA (at the time they took the course) appeared to be a factor in predicting student performance in a course. On the other hand, 14% of the students earned a grade higher than their current grade point average in both online and face-to-face courses.

Results of this study were consistent with findings discovered in the literature and showed students perform equally as well in the traditional and online delivery methods.

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Chapter I: Introduction

As technology changes and the world becomes more dependent on Internet functions, online learning has gained recognition and functionality. Online learning is one of the fastest growing trends in educational uses of technology. Online learning has roots in the tradition of distance education, which goes back at least 100 years to early correspondence courses (U.S. Department of Education, 2009). Online learning is the ultimate in flexibility. Students can participate from home, school, or library - anywhere internet access is available. “Never set foot in a classroom while entering the wonderful world of flexible learning” (CVTC, 2010-11). Postsecondary schools have increased online offerings.

There are other benefits to online courses that may be useful for Career and Technical Education (CTE) programs. Some of these benefits along with flexibility are convenience and accessibility. Depending on the specific program, a student is able to complete assignments and even participate in lectures and class discussions on his or her own time (Metz, 2010).

CTE has the responsibility of preparing students for the future and lifelong learning. As the online movement expands, students will benefit from the experience of an online course during their years in high school. Today, more than 90 percent of postsecondary schools offer online courses, including CTE courses (Metz, 2010).

In current educational settings all over the world, the internet is creating change. Colleges and universities are promoting growth in online course offerings in an effort to fight economic and enrollment decline. The promotion and growth of online education suggests that online courses are equivalent or superior to traditional on-campus courses in terms of improved student access, increased rate of degree completion, lowered costs, and appeal to non-traditional students (Allen & Seaman, 2007). Studies of online learning versus traditional classroom

learning have focused on many aspects of learning including the effectiveness of technology (Schenker, 2007), knowledge transfer (Hansen, 2008), and student engagement, learning, and satisfaction (Rabe-Hemp, et. al, 2009). Studies of online courses have provided insight into the use and effects of technological innovations such as interactive software usage for e-learning (Pena-Sanchez, 2009), and the creation of interactive learning environments (Everson & Garfiel, 2008). Research has also considered the evaluation of information technology integration in traditional courses (Christou & Dinov, 2010).

For the past several years, online enrollments have continued to grow at rates far in excess of the total higher education student population, although at lower rates than for previous years. Almost 3.5 million students were taking at least one online course during the fall 2006 term- a nearly 10 percent increase over the number reported the previous year (Allen & Seaman, 2007). The 9.7 percent growth rate for online enrollments far exceeds the 1.5 percent growth of the overall higher education student population (Allen & Seaman, 2007). Nearly twenty percent of all U.S. higher education students were taking at least one online course in the fall of 2006 (Allen & Seaman, 2007).

There have been many studies conducted regarding online learning. Some authors report online learning can be very effective depending on the subject, although perhaps, in courses where problem solving is required, such as science or math courses, face-to-face instruction or at least synchronous chat with the instructor may be preferred over asynchronous, online learning (Quillen, 2010). Many researchers found no significant difference in satisfaction, motivation or achievement between online and traditional learners (Bernard, et.al, 2004). Other investigators found that online learning can be as effective as traditional learning (Zhao, et.al, 2005). According to a 2009 study conducted by the U.S. Department of Education, which reviewed

more than 1,000 studies conducted on online learning between 1996 and 2008, students performed better in an online education situation than in face-to-face situations, on average, (Feintuch, 2010).

According to Bureau of Labor Statistics (2010-11), the job outlook for Medical Records and Health Information Technicians (HIT) is expected to increase by 20 percent, much faster than the average for all occupations through 2018. The projected employment figures from the U.S. Department of Labor show that 35,100 jobs will be added to the health information field by the year 2018. Health Information Management (HIM) professionals work in a variety of different settings and job titles. Job prospects should be very good. In addition to job growth, numerous openings will result from the need to replace medical record and health information technicians who retire or leave the occupation permanently. Technicians who demonstrate a strong understanding of technology and computer software will be in particular in demand (U.S. Department of Labor, 2010-11).

Chippewa Valley Technical College (CVTC) is a two-year technical college located in the western Wisconsin city of Eau Claire. The college is one of 16 technical colleges in the Wisconsin Technical College Systems (WTCS). CVTC offers two-year Associate Degree programs in specialty areas requiring specialized technical skills.

AHIMA (American Health Information Management Association) members affect the quality of patient information and patient care at every touch point in the healthcare delivery cycle (AHIMA, 2011). According to an article by Genna Rollins in the Journal of the American Health Information Management Association “Health information management may be one of the hottest healthcare careers in the coming decade, with up to 50,000 new jobs anticipated in the field.” Rollins also stated in the same article that “This growth presents great opportunities for

the profession, but it also means changes in roles, in-demand skill sets and educational requirements” (Rollins, 2010, p.28).

HIT is one of the few professions that have shown signs of life in the job market, with some forecasters going as far as to predict that available positions will soon outnumber qualified applicants. HIT programs are incorporating more technological elements. Some schools are offering online course-work to attract nontraditional students, and many are finding ways to help their students receive hands-on experience with electronic records (Yeager, 2011). Many schools and universities now offer individual courses and entire programs through distance learning. The surge in interest in distance learning is evident at the associate, baccalaureate, and master’s level of health information-related programs around the United States. Among accredited schools, AHIMA estimates that at least 13 baccalaureate and 38 associate degree programs offer some distance learning opportunities (Lane, 2011).

The Health Information Technology Program has been offered at Chippewa Valley Technical College since 1971. This two-year program is designed to prepare students for a role in the health information management (HIM) profession in healthcare settings. HIM professionals are skilled in collecting, maintaining, analyzing, and disseminating clinical data for the healthcare community, while applying legal regulations to maintain the confidentiality and security of patient data. The program consists of health information technology courses, professional practice experiences, technical information technology support courses, and general studies courses. The Health Information Technology Program is accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). CAHIIM currently accredits over 275 academic programs in the U.S. at the undergraduate and graduate academic levels (CAHIIM, 2011).

Chippewa Valley Technical College's Health Information Technology Program graduates are eligible to write the national certification examination offered by the American Health Information Management Association (AHIMA) to become a Registered Health Information Technician (RHIT). To obtain the RHIT credential, an individual must graduate from a 2-year associate degree program accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM) and pass the AHIMA-administered written examination.

The enrollment in the HIT program at CVTC has seen a steady increase in the number of students over the past 10 years. This can be directly contributed to the college's initiative to expand the program. The highest enrollment in the health information technology program at CVTC was in 2006 with 47 students. Currently the HIT program accepts new students each fall and spring semesters in a day-time, full-time, on-campus track. An online program track was introduced briefly in 2008. Due to budget constraints, a full roll out of the program did not take place. Current students have taken online classes at other Wisconsin Technical College Systems (WTCS) HIT programs because of the flexibility of online courses. Before the online HIT program is introduced again, the HIT program faculty wants to find out if students enrolled in the HIT program at CVTC perform any differently online as they would in a face-to-face course. The specific elements of efficacy being investigated are student enrollment and retention, graduation GPAs and age related GPAs.

Statement of the Problem

The faculty of Chippewa Valley Technical College's Health Information Technology Program does not know how students perform online versus face-to-face. There is no known research on whether students perform any differently online versus face-to-face in the HIT

program. There is a need for data comparing the success of an online program to an on-campus program in the Health Information Technology Program.

Purpose of the Study

The HIT faculty does not know how students perform online versus face-to-face. The purpose of this study is to determine if students enrolled in the HIT program at CVTC perform any differently online as they do in a face-to-face course.

Research Questions:

This study will attempt to answer the following research questions:

1. How do HIT program students grades in an online delivery course compare to an on-campus delivery course?
2. Does age play a role with respect to student success in both online delivery courses and on-campus HIT program courses?
3. Does cumulative GPA correlate to student success in both online learning courses and on-campus HIT program courses?
4. How do completion rates differ in an online delivery course compared to an on-campus delivery course?

Nature of the Study

This study is an ex post facto (casual-comparative), non-experimental design. Ex post facto (casual-comparative) is a quantitative research that explores possible causes and effects (Allyn & Bacon, 2008). The ex post facto will explore the academic performance along with the variables within existing HIT courses. I am using a convenience sampling because the data is accessible. This study will determine if students enrolled in the HIT program at CVTC perform any differently online as they do in face-to-face courses. The subjects of this study will be those

students who were enrolled in and completed face-to-face and online HIT courses at CVTC. The records that will be analyzed are those students who were enrolled in course number 530-181: Introduction to the Health Record for spring and fall semesters 2011 and course number 530-103: Medical Insurance and Billing for the fall semester 2006 and the spring semester of 2009. Information will be obtained from the Registrar's Office at CVTC. The data will be collected and analyzed in relation to online students versus on-campus students. The data will be used to evaluate the feasibility of an online HIT program at CVTC and will also help to determine the success rate of online student learners.

Significance of the Study

This study will determine how students enrolled in the HIT program perform differently online as they would in a face-to-face course. The results of this study may benefit other programs within CVTC looking to go totally online, other HIT programs within the WTCS region, Dean of Health and the HIT faculty. This study will evaluate the feasibility of an online HIT program at CVTC. The results will also help determine the success rate of online student learners.

Limitations of the Study

The following are limitations of this study:

1. This study is limited to the students who have completed an online learning or on-campus course in an HIT program for the fall semester 2006, spring semester 2009 and spring and fall 2011. The student academic data was limited to those students enrolled in a Health Information Technology program at that time. The student experiences were limited to those students enrolled in courses during this time period and may not be applicable to students in other years.

2. Variables were not controlled other than the type of course delivery. These variables include, but are not limited to, student's family situation and home life, student's employment status, student's learning disabilities, and other burdens placed on the student during the semester.
3. This study focused on the academic success of online learning versus on-campus learning. Grades may not be the greatest measure of academic success. Some students may have test anxiety and do poorly on test taking, but yet have a good understanding of course competencies.
4. The results of this study may influence the Health Information Technology Program faculty and may or may not be applicable to other programs offered at Chippewa Valley Technical College.

Assumptions

The assumptions of this study are that the data received from the Registrar's Office is accurate. The second assumption is that the subjects are Health Information Technology program students.

Definition of Terms

American Health Information Management Association (AHIMA): Professional association of the health information management (HIM) professionals. AHIMA's more than 61,000 members are dedicated to the effective management of personal health information required delivery quality healthcare to the public (AHIMA, 2011).

Health Information Technician (HIT): Also called Medical Records Technicians, they manage, analyze and organize patient medical records and databases for statistical reports and studies. They design and manage health information systems to ensure they meet medical, legal

and ethical standards (All Allied Health Schools, 2011).

Health Information Technology Program: Health Information Technicians contribute to the quality of care by collecting, analyzing, organizing and reporting data. This requires knowledge of disease, treatments, computer systems and organizational skills. Chippewa Valley Technical College (CVTC) offers an associate degree in this area. The HIT program is accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM) (CVTC Program Catalog, 2010-2011).

Internet: The global connection of computers via interlinked networks across the World Wide Web (Bach, et.al, 2007).

Online: Learning that takes place entirely over the Internet. In an online course, there is no physical classroom.

Traditional Learning: A course which is offered in an instructor-led, face-to-face capacity within the confines of a classroom.

Chapter II: Literature Review

Introduction

The following review of literature will provide the history of the internet, the characteristics, performance and retention of the adult learner. It will also discuss the advantages and challenges of online learning. This chapter will conclude with a summary of the evolution of online learning at Chippewa Valley Technical College (CVTC) and the online opportunities offered within the Health Information Technology (HIT) program at CVTC.

History of the Internet

The Internet was the result of some visionary thinking by people in the early 1960s who saw great potential importance in allowing computers to share information on research and development in scientific and military fields. J.C.R. Licklider of Massachusetts Institute of Technology (MIT), first proposed a global network of computers in 1962, and moved over to the Defense Advanced Research Projects Agency (DARPA) in late 1962 to head the work to develop it (Howe, 2011). In 1966, the first Advanced Research Projects Agency Network (ARPANET) plan was unveiled by Larry Roberts of MIT. The first official network nodes were the University of California at Los Angeles, the University of California at Santa Barbara, the University of Utah and the Stanford Research Institute (Moschovits, Poole, Schuyler, & Senft, 1999).

Computers were added quickly to the ARPANET during the following years, and work continued on completing a functionally complete Host-to-Host protocol and other network software. In October 1972, Bob Kahn organized a very successful demonstration of ARPANET at the International Computer Communication Conference (ICCC). It was also in 1972 that the initial “hot” application, electronic mail, was introduced (Howe, 2011).

In 1982, internet technology protocols were developed, commonly known as TCP/IP (Transmission Control Protocol and Internet Protocol). This led to one of the first definitions of an “internet” being a connected set of networks. The World Wide Web was launched to the public on August 6, 1991. With the advent of the Internet and the World Wide Web, the potential for reaching students around the world increased greatly, and today’s online learning offers rich educational resources in multiple media and the capability to support both real-time and asynchronous communication between instructors and learners, as well as among different learners (U.S. Department of Education, 2009).

More people use the Internet to get connected to others, find information, conduct business, and share information than ever before in history. Properly used, the internet is certainly an important educational tool. It has transformed the way students and faculty communicate, amass information, and conduct research, putting onto desktop and laptop computers immediate access to the world’s libraries and research facilities. In this regard, it will play an essential role in the future of education (Botstein, 2007).

Yes, the Internet will play an important role in the future of education, but it will not end face-to-face interactions, small group discussions, and one-on-one teaching that have been at the heart of education. Just as the Internet will never bring about the demise of the book (as was once predicted), it will also never replace teaching and learning from one another face-to-face (Botstein, 2007).

Adult Learner

The adult learner and the way in which they learn best have been questioned and researched since the 1920s, when adult education became a professional field of practice (Merriam, 2001). Today, several theories and models attempt to explain learning. One of the

best known theories is Malcolm S. Knowles' learning theory of andragogy. This reason for learning, known as the theory of adult learning or andragogy, (Knowles, 1984) was developed to explain why adult learning is different. Andragogy (adult learning theory) has six principles. First, adults need to know the reason they need to learn something or how it will benefit them. Second, adults are self-directed learners, meaning they take control of how they learn. Third, they want to use what they know and want to be acknowledged for having that knowledge. Fourth, adults need to be ready to learn. Fifth, they want to see how what they are learning will apply to their life, a task they need to perform, or to solve a problem. Adults learn best when the knowledge is presented in a real-life setting. And finally, the sixth characteristic is that adults need to be motivated to learn (Knowles, Holton & Swanson, 1998).

There are three additional important adult learning theories that will provide information that may help the instructor in creating an online program for adults. These theories include self-directed learning, experimental learning, and transformational learning. Self-directed learning underlies Knowle's andragogy (Cercone, 2008). The theory of andragogy recognizes that as a person grows and matures, his or her self-concept changes from that of a dependent personality toward that of a self-directed individual (Cercone, 2008). Older students need to be directed as they progress toward self-direction to take more accountability for their own learning.

Experimental learning is a concept central to andragogy. It is composed of three components: (a) knowledge of concepts, facts, information, and experience; (b) prior knowledge applied to current, ongoing events; and (c) reflection with thoughtful analysis and assessment of learners' activity that contributes to personal growth (Cercone, 2008). These concepts are critical to experimental learning and they should provide the foundation of any adult learning experience. According to Merriam and Caffarella (1999), "experiences that provide learning are never just

isolated events in time. Rather, learners must connect what they have learned from current experiences to those in the past as well as see possible future implications” (p.223). The third is transformative learning theory. This theory is considered a constructivist theory of adult learning. Frey and Alman (2003) state that transformative learning is a process of critical reflection. It is about change in learners, and it is the kind of learning that occurs when individuals make meaning out of the work through experiences (Cercone, 2008). This type of learning involves learning about one’s personal life.

According to Cercone (2008), there is not one theory that can explain how adults learn. There are many theories; each compelling, and each has its own strengths and weaknesses. The main theme is that everyone is different, and each person is an individual. Another finding in all of these learning theories is that adult leaning is about change. The instructor needs to acknowledge this and support learners as they go through these changes, allowing the students to experience discovery as part of the learning process.

Characteristics of Adult Learners

Much of the research done on successful students in distance education programs suggests that students who are attracted to this form of education share certain characteristics. Unlike K-12 education, students in higher education are all adults and consist of unique student characteristics. Their age and life characteristics make them different than children (Lin & Kuo, n.d.). They are voluntarily seeking further education, are motivated, have higher expectations, and are more self-disciplined (Palloff & Pratt, 2003). The successful student needs to have a number of characteristics such as tolerance for ambiguity, a need for autonomy, and an ability to be flexible (Threlkeld & Brezoska, 1994).

The adult learner tends to have a more serious attitude toward their courses, education and training than the average student. According to Moore and Kearsley (1996), most distance education students are adults between the ages of 25 and 50. They are not necessarily looking for campus-based education and social opportunities. Consequently, they bring with them a different set of assets and expectations to the learning process (Palloff & Pratt, 2003). The estimate of the number of 18 to 22-year-olds attending college full-time and living on campus is only one-fourth of the undergraduate population.

Retention & Performance

One of the most critical problems with online learning is the high turnover rate even though the number of enrollments has increased. In spite of the growth in online learning, high dropout rates have been of concern to many organizations and higher education institutions. Both Bauman (2002) and Lorenzetti (2002) find that dropout rates for online programs of 50 percent or more are not unusual. Diaz (2002) reports a more conservative online drop rate of 13.5 percent compared to 7.2 percent for traditional students. Murray (2001) reports that the Washington State Community College online program claims retention rate of 70 percent for online students and 85 percent for traditional students. Carr (2000) writes that Dallas Community College reports an 11 to 15 percent difference in the course complete rate, and a 14 percent difference at Tyler Community College.

A number of studies have shown that a higher percentage of students participating in an online course tend to drop out compared to students in a face-to-face classroom (Hiltz, 1997; Phipps & Merisotis, 1999). While there does not yet appear to be any standardized national retention rate numbers available (Murray, 2001; Carr 2000), anecdotal evidence suggest that online courses average 50 to 60 percent retention, while face-to-face classes are well above 60

percent (Gleason, 2004). Murray (2001) also finds that many people disagree with the validity of these statistics, since retention rates for both online and traditional students differ in institutions. Carr (2000) indicates that different institutions record these rates differently. Some institutions do not count students who drop classes during the first few weeks of the semester, while others do. According to Gleason (2004), measuring the retention rate might be more useful at the local level, instead of a national level, since it can be affected by many factors.

Diaz (2002) indicated that uncontrollable factors influence dropout decisions and a high dropout rate is not necessarily indicative of academic non-success. Some of the key issues that appear to affect the retention rates include the feelings of isolation, poorly designed courses, communication difficulties, lack of program support and guidance, as well as difficulty with technology (Gleason, 2004).

Peripheral factors that relate to online learning include computer self-efficacy (Sam, Othman, & Nordin, 2005), computer anxiety (Chua, Chen, & Wong, 1999), attitude toward Internet (Woodrow, 1991), and computer skills (Zhang & Espinoza, 1998), and the like, may be correlated with each other, and associated with the overall performance of online learning (Lin & Kuo, n.d.).

According to a recent U.S. Department of Education meta-analysis of online education research, “On average, students in online learning conditions performed modestly better than those receiving face-to-face instruction” (U.S. Department of Education, 2009).

Online Learning

While online learning, in some form, has been in place since the 1960’s, its overall use and scale have exploded in recent years. Over the past decade, online learning has experienced significant growth at all levels of education.

Target Population

The number of students taking at least one online course continues to increase at a rate far in excess of the growth of overall higher education enrollments. The most recent estimate was 3.48 million students were taking at least one online course during the fall 2006 term; an increase of 9.7 percent over the number reported the previous year. The 9.7 percent growth rate for online enrollments far exceeds the 1.5 percent growth of the overall higher education student population. Nearly twenty percent of all U.S. higher education students were taking at least one online course in the fall of 2006 (Allen & Seaman, 2007).

Advantages of Online Learning

Online courses provide students with many advantages: alternatives to traditional colleges, courses that they may not otherwise enroll in, opportunities for home schooling, ways to better meet the needs of the new digital age student, and a medium for receiving extra help (Metz, 2010). Some have found that online learning is helpful for all students. LeFee (2001) found that “students who are in the mid-to lower-third of achievement tend to do well with this technology if they are motivated because distance learning gives them more time” (Metz, 2010).

According to several surveys, the top reasons students seek out online courses is to accommodate their schedules/time commitments (Eaton, 2005; Kibby, 2007; Stodel, et al., 2006). Another two reasons for taking online courses is to avoid commuting and/or because of the unavailability of local educational programs (Eaton, 2005). According to Hailey, et al., (2001), they suggest that in addition to the benefit of increasing accessibility, students who might perform poorly in or who would otherwise be unable to attend a traditional classroom may be more likely to flourish in the online version of the same course.

Online courses today may be able to positively impact CTE programs. Although online

courses have not converted schools today as the visionaries suggest, the rapid increase of enrollment in online courses may be a true indication that the movement is quickly approaching. Whether it is online courses or technology in general, the transformation will continue to have an important role in the future (Metz, 2010).

Distance education is a popular choice for HIM professionals looking to advance their education while working full-time. Distance education offers flexibility that's hard to beat for busy professionals looking to extend their education. It also connects students with programs that fit their needs, wherever they are located. However, a distance program requires self-direction and self-discipline, and even without a commute or rigidity of classroom schedules, it still competes with a busy work and home life (Dougherty, 2011).

Author LaFee (2001) stated he envisions online learning has a great potential to change the educational system, transforming schools as places to learn social skills, and where teachers will become facilitators to learning. He believes that students have taken the initiative to learn for themselves. CTE needs to be ready for this transformation and to begin to take advantage of online learning (Metz, 2010).

Online learning also addresses the new digital age student. Research has shown that online instruction is a strategy that can enhance and expand the skills of the 21st century digital learner (Daggett, 2008). According to Jukes, Kelly and McCain (2008), this transformation has created major shifts to higher order thinking skills; changes in the way students learn, think, and act; the amount of knowledge that can be accessed; and the applications to the global world. The authors conclude that schools must offer more choices to reflect the new digital age student.

Challenges of Online Learning

However, while the use of online learning is growing rapidly, so are the challenges and

concerns. These challenges include the quality of instruction, hidden costs, misuse of technology, and attitudes of instructors, students, and administrators (Valentine, 2002). The first challenge is the quality of instruction that is given through distance learning programs. Research suggests that the effectiveness of distance learning is based on preparation, the instructor's understanding of the needs of the students, and an understanding of the target population (Omoregie, 1997). The second challenge is the hidden costs of distance learning programs. The startup, maintenance, and personnel costs should also be factored in to a distance learning program. The costs associated with training technicians and instructors should not be overlooked. For effective distance education to take place, the staff delivering the instruction should be well trained (Valentine, 2002). The third challenge is misuse of technology. The instructors must be trained "not only to use technology, but also to shift the way in which to organize and deliver material" (Palloff & Pratt, pg. 3). Equipment and hardware failures can also be a great disadvantage to the effectiveness of distance learning. The last challenge is the attitudes of instructors, students and administrators. Instructors must be motivated to prepare effectively for classes. Part of the responsibility for motivation must lie with the administration and their support of the program (Valentine, 2002). There are some students who have concerns with distance learning classes. Not all students are suited to this type of learning and not all are best taught via this medium (Valentine, 2002).

Despite the challenges with distance learning, studies indicate students are relatively satisfied with what they are receiving. A study of students at Indiana University of Pennsylvania found 75% were very satisfied with the instruction they received and 90% rating the technology as satisfactory (Ferguson & Wijekumar, 2000). Another study by Harner et.al, (2000) was done at the University of Connecticut. They found that 57.5% would take another distance learning

course.

Pedagogy

To ensure the quality of online instruction, the online learning environment must be designed first before the instructor embarks on the online course delivery (Yang, Cornelious, 2005). Wu & Hiltz (2004) stated in their study, which examined student's learning from asynchronous online discussion, that the instructor plays a significant role in motivating effective online discussion. Therefore, more online guidance, more structured discussion topics and considerate time commitment are required for instructors (Yang, Cornelious, 2005.).

The online learning environment also embraces pedagogical use of technology (Ascough, 2002; Yeung, 2001), integration of instructional design elements (Zheng & Smaldino, 2003), various types of medium and media (Deubel, 2003; Palloff & Pratt, 1999; McAlister et al., 2001), and diversified learning methods include deep learning, critical thinking, collaborative learning, and problem-based learning (Ronteltap & Eurelings, 2002; Rosie, 2000; Wheeler, Waite & Bromfield, 2002; Ascough, 2002).

Several researchers (Ascough, 2002; Ronteltap & Eurelings, 2002; Rosie, 2000) have reported that online education can inspire students' deep learning and critical thinking skills when learned collaboratively or under problem-based scenarios. Ronteltap and Eureling's (2002) experimental study revealed that when students are learning in a problem-based practical learning, more interaction of students are caused, and students learn more quickly (Yang, Cornelious, 2005).

To facilitate high-quality online courses, Palloff and Pratt (2003) have a simple model as the basis for illustrating how the core and custom pedagogies can be implemented. In their model, they outline four major cornerstones interdependent with learning communities: effective

virtual students, effective course design, effective online facilitator, and effective student support. Palloff and Pratt (2003) recommend that the program orientation should include orientation to the courseware, basics of Internet use, how and where to get help when needed, technology requirements for online courses and programs, and information about any course or program policies (Yang, Cornelious, 2005).

Robert Gagne, who is considered to be the primary researcher and contributor to the systematic approach to instructional design and training, developed the nine events of instruction. According to Gagne, all good instruction requires a set of external events designed to support the internal processing of learning (Pecorino, n.d). The nine events that he has identified are:

- Gain attention – Prepares and alerts students to receive new information.
- Inform the learner of the objectives – Communicates the list of objectives.
- Stimulate recall of prerequisite learning – Review any prior material so it is fresh in the students' mind.
- Present the stimulus material – New information is presented in readings, lectures, websites and Power Points.
- Provide learning guidance – Suggestions or questions provided by the instructor to help guide the student to understand the new concept or procedure being learned.
- Elicit the performance – Practice new information so it becomes integrated into the student's knowledge structure.
- Provide feedback about performance – Feedback is necessary after the performance to ensure that the student's new knowledge is correct.
- Assess performance – Some form of assessment can be used to test the ability of the

- student and the effectiveness of the instruction.
- Enhancing retention and transfer – Students should be provided with activities that help them put the new learning context.

Bill Pelz, Professor of Psychology at Herkimer County Community College is the recipient of the 2003 Sloan-C award for Excellence in Online Teaching. He states that his three principles of effective online pedagogy are: Principle #1: Let the students do (most of) the work. The roll of the instructor is limited to providing the necessary structure and directions, supportive and corrective feedback, and evaluation of final product (Pelz, 2004). Principle #2: Interactivity is the heart and soul of effective asynchronous learning. He believes that interactivity is what differentiates an effective online course from a high-tech correspondence course. Interaction is not just discussion. Students can be required to interact with the instructor, with the text, with the internet, with the entire class, in small groups, or one-on-one, etc. Any course can be designed with required interactivity. Principle #3: Strive for presence. Research in the field of online learning suggests that discussion responses that add value to a discussion fall into one or more of three categories: Social Presence, Cognitive Presence, or Teaching Presence (Garrison, Anderson, Archer, 2000). Social presence can be demonstrated when students in an online course help create a community of learning by projecting their personal characteristics into the discussion they present themselves as “real people.” Cognitive presence can be demonstrated by introducing factual, conceptual, and theoretical knowledge into the discussion. Teaching presence is defined as the facilitation and direction of cognitive and social process for realization of personally meaningful and educationally worthwhile learning outcomes (Garrison, Anderson, Archer, 2000).

The design of a successful online course is very dependent upon the teaching and

learning strategies that a faculty member employs. The way an online course is designed and structured has significant influences on degree of online participation (Bullen, 1998, Vrasidas & McIsaac, 1999). Many online courses are often built upon the values of constructivist theory which states that we construct new knowledge as we are actively involved in learning and that learning is tied to past experiences.

Traditional versus Online Learning

Online learning offers many advantages over face-to-face courses. By having the flexibility to participate in online learning anytime and anyplace, students who are enrolled in online Career Technical Education (CTE) courses can participate in the online course components at their convenience. The most appealing advantage of online courses can provide flexibility for CTE programs (Metz, 2010).

Although online education using the Internet and other technologies is becoming prevalent, face-to-face education, in which an instructor teaches a number of learners in a class, is still the standard method of teaching in most educational institutions. In this method, the instructor aims to satisfy as many learners as possible in a class, which may consist of learners with different levels of understanding and proficiency (Fujiwara, Fukushima, & Maeda, 2009).

Traditional education and online education each have unique advantages. The supportive face-to-face environment of the classroom allows immediate feedback, and an immediate social environment, which has been viewed as essential to a quality educational experience. Facial expressions and body language are vital clues to the level of student understanding and engagement, and fundamental to recognizing those “teachable moments!” (“Key Differences”, 2011).

Evolution of Online Learning at CVTC

In 2001, Chippewa Valley Technical College implemented distance learning via the internet which was made possible by way of a Web-based course delivery called Blackboard (Bb). All Online courses use Blackboard, CVTC's course management system. Blackboard can be used when students are enrolled in online, hybrid, web-conferencing, and web-enhanced face-to-face courses. Blackboard offers the ability to deliver course content, communicate expectations of students in the course via announcements, and allows for students to communicate with one another using an online discussion format. By using Blackboard, students can access course materials, participate in written discussions, complete tests, assignments, and view grades.

Blackboard is highly encouraged by CVTC management for traditional courses and must be used for hybrid courses. This applies to class sections that consist of a blended format whereby traditional classroom-led instruction is combined with an online learning component.

CVTC HIT Program Online Offerings

Chippewa Valley Technical College (CVTC) is a two-year technical college located in the western Wisconsin city of Eau Claire. The college is one of 16 technical colleges in the Wisconsin Technical College System (WTCS). CVTC offers two-year Associate Degree programs, certificates and diplomas in specialty areas requiring specialized technical skills.

The enrollment in the Health Information Technology (HIT) program at CVTC has seen a steady increase in the number of students over the past 10 years. This can be directly attributed to the college's initiative to expand the program. The highest enrollment in the HIT program at CVTC was in 2006 with 47 students. Currently the HIT program accepts 18 new students each fall and spring semesters in a day-time, full-time on-campus track. An online

program track was introduced briefly in 2008. Due to budget constraints, full implementation of the program did not take place. When the CVTC course schedule is unable to conform to students' needs and schedules, these students enroll in online courses at other Wisconsin Technical Colleges (WTCS). The CVTC HIT program faculty is interested in the student performance between face-to-face and online HIT courses. The specific elements of efficacy being investigated are student enrollment and retention, graduation GPAs, and age related GPAs.

The HIT program at CVTC began offering Internet-based online sections using the learning management system Blackboard in fall 2003. Human Disease for the Health Professions and Medical Terminology were the first courses to be offered online. From that time to the current semester (fall, 2011), there have been two more classes that have been offered online: Introduction to the Health Record and Medical Insurance and Billing. This study will examine these two courses.

Summary

Review of literature shows that there is an upward trend toward online offerings. The literature identifies many advantages of online learning. Online learning provides flexibility of time, location and courses offered and it allows non-traditional students the option to pursue their education while continuing with their current employment and other responsibilities (ACTE, 2010). Many more adult learners are experiencing the great accessibility that computer technologies have brought. Many researchers (Kessell, 2000; Roberts 2000; Maeroff, 2003) found that many adult learners are interested in gaining advanced degrees and certifications via distributed learning because of the flexibility it offers (Lin & Kuo, n.d.). There has been no research done at CVTC on whether students perform any differently face-to-face versus online in

the HIT program. Therefore, this study is very important to the HIT faculty. This study will investigate the academic achievements of the online learners at CVTC in the HIT program.

Chapter III: Methodology

Introduction

The purpose of this study was to determine if students enrolled in the Health Information Technology (HIT) program at Chippewa Valley Technical College (CVTC) perform any differently online as they do in face-to-face courses. The specific elements of efficacy being investigated are student grades, age, cumulative GPA, and completion rates of an online course compared to on-campus course.

Chapter three includes information that describes the research design, sample selection, instrumentation and data collection procedures, and data analysis. Chapter three will conclude with a description of limitations of the study.

This study attempted to answer the following research questions:

1. How do HIT program students grades in an online delivery course compare to an on-campus delivery course?
2. Does age play a role with respect to student success in both online delivery courses and on-campus HIT program courses?
3. Does cumulative GPA correlate to student success in both online learning courses and on-campus HIT program courses?
4. How do completion rates differ in an online delivery course compared to an on-campus delivery course?

Research Design

This study is an ex post facto (casual-comparative), non-experimental design. Ex post facto (casual-comparative) is a quantitative research that explores possible causes and effects. Ex post facto (casual-comparative) research is used to investigate the relationships between

independent and dependent variables in situations where it is impossible or unethical to manipulate the independent variable (Allyn & Bacon, 2008). This type of study is very common and useful when using human subjects in real-world situations and the investigator comes in “after the fact” (Diem, 2002).

In this study ex-post facto (casual-comparative) research will assist in determining if students enrolled in the HIT program at CVTC perform any differently online as they do in a face-to-face course. Specific reasons for the differences will be explored, such as student grades, age, cumulative GPA, and completion rates of an online course compared to an on-campus course.

Sample Selection

The population involved in this study consists of Health Information Technology (HIT) students who successfully enrolled in and completed face-to-face courses and online HIT courses at Chippewa Valley Technical College (CVTC). Convenience sampling was used in this study. Convenience sampling involves drawing elements from a group that is easily accessible and is one of the most commonly used purposive sampling techniques (Tashakkori & Teddlie, 2003).

The sample drawn from the populations were students who took Introduction to the Health Record and Medical Insurance and Billing for spring and fall semester 2011, fall 2006 and spring semester of 2009. The same instructor taught both the online and face-to-face delivery method in both courses. Both instructors have continuity with the same exams, assignments, and lecture material in both delivery methods. Data used to perform this study was provided by the Registrar’s Office at CVTC, Eau Claire, Wisconsin. The sample for this study included 70 students who completed the two different courses.

Instrumentation

The Registrar at CVTC provided the data for this study. A request was made to the Institutional Research & Planning Analyst at CVTC for student data where courses were offered in traditional and online format. The request asked for the course number, age of the student, course format, course grade and the student's cumulative grade point average. Tables that compiled this information were used as a viewing tool for the author. The request produced data from the 2011 spring and fall Introduction to the Health Record course and Medical Insurance and Billing course from fall 2006 and spring 2009 that were offered traditional and online. The same instructor taught both traditional and online courses.

Data Collection

The source of data that was used in this study was from the Registration Department at CVTC. A request was made to the Institutional Research & Planning Analyst at CVTC for student data where courses were offered in traditional and online format. The request asked for the course number, age of the student, course format, course grade and student's cumulative grade point average. Tables that compiled this information were used as a viewing tool for the author. The request produced data from the 2011 spring and fall Introduction to the Health Record course and Medical Insurance and Billing course from fall 2006 and spring 2009 that were offered traditional and online. The same instructor taught both traditional and online courses. There were 20 students enrolled in the spring and fall Introduction to the Health Record traditional and online courses. There were 25 students enrolled in the fall 2006 traditional course and 5 students enrolled in the spring 2009 online Medical Insurance and Billing course.

Data Analysis

The data in this study was analyzed to determine the differences in student performance (the dependent variable) while the method of instruction (the independent variable) was manipulated. The student grades were reviewed whether the student was enrolled in the traditional or online course. The research questions are outlined below with the techniques used to answer the question.

1. How do HIT program students grades in an online delivery course compare to an on-campus delivery course? The course letter grade was translated into a four-point numeric scale. A comparison of the mean grade earned was used to see the impact on the mean grade for the students between the traditional and online course. The activity assisted in determining if the course format impacted the grade of the students.
2. Does age play a role with respect to student success in both online delivery courses and on-campus HIT program courses? Four distinct age groups are created to simplify the analysis of the data. The four age groups are <21, 22-30, 31-40 and >41. A two-way analysis of variance against student grades was used with method of delivery and age acting as the independent variables while course grade acted as the dependent variable. A comparison of the mean grade was used to see the impact on the mean grade for students based on the students' age. The activity assisted in determining if the age of the student impacted the grade of the students.
3. Does cumulative GPA correlate to student success in both online learning courses and on-campus HIT program courses? A two-way analysis of variance against student grades was used with method of delivery and cumulative GPA acting as the

- independent variables while course grade acted as the dependent variable. A comparison of the mean grade was used to see the impact on mean grade for the students based on cumulative grade point average. The activity assisted in determining if current grade point average of the student impacted the grade of students.
4. How do completion rates differ in online delivery course compared to an on-campus delivery course? A one-way analysis was used to determine if there was a statistically significant difference between the completion rates in the course delivery method. A comparison of the mean grade was used to see the impact on the mean grade for the students' based on the completion rates.

Limitations

The following are limitations of this study:

1. This study is limited to the students who have completed an online learning or on-campus course in an HIT program for the fall semester 2006, spring semester 2009 and spring and fall 2011. The student academic data was limited to those students enrolled in a Health Information Technology program at that time. The student experiences were limited to those students enrolled in courses during this time period and may not be applicable to students in other years.
2. Variables were not controlled other than the type of course delivery. These variables include, but are not limited to, student's family situation and home life, student's employment status, student's learning disabilities, and other burdens placed on the student during the semester.
3. This survey focused on the academic success of online learning versus on-campus

- learning. Grades may not be the greatest measure of academic success. Some students may have test anxiety and do poorly on test taking, yet have a good understanding of course competencies.
4. The results of this study may influence the Health Information Technology Program faculty and may or may not be applicable to other programs offered at Chippewa Valley Technical College.

Ethical Issues

The author is a full-time instructor in the Health Information Technology Program at Chippewa Valley Technical College. The author completed several steps and maintained complete student confidentiality when collecting data for this research project.

The Institutional Review of Research at Chippewa Valley Technical College approved the study on November 1, 2011. Additionally, the University of Wisconsin – Stout's IRB reviewed the study as required by the Code of Federal Regulations Title 45 Part 46. IRB approved the study under Category 1 of the Federal Exempt Guidelines on April 20, 2012.

Chapter IV: Results

Introduction

The purpose of this study was to determine if students enrolled in the Health Information Technology (HIT) program at Chippewa Valley Technical College (CVTC) perform differently online as they would in a face-to-face class. The specific elements of efficacy being investigated are student enrollment and retention, graduation GPAs, and age related GPAs. The following review of literature provided an investigation of this advancement of online learning and current research was analyzed to determine the findings of the success of student learning.

Participants

Participants in this study consisted of Health Information Technology (HIT) students who successfully enrolled in and completed face-to-face courses and online Introduction HIT courses at Chippewa Valley Technical College (CVTC) for the spring and fall semester 2011, fall 2006 and spring semester of 2009. The two courses were Introduction to the Health Record and Medical Insurance and Billing. There were 40 students enrolled in the spring and fall Introduction to the Health Record traditional and online courses. There were 25 students enrolled in the fall 2006 traditional course and 5 students enrolled in the spring 2009 online Medical Insurance and Billing course. The same instructor taught both the online and face-to-face delivery method in both courses. Both instructors have continuity with the same exams, assignments, and lecture material in both delivery methods. The Registrar's office at CVTC provided the following data to perform this study: student identification number, section number for the course, age of student, semester that the course was taken, method of course delivery, course grade and current cumulative GPA at the time the course was taken.

How do HIT program students perform in an online delivery course compared to on-campus delivery course?

In order to more easily interpret the data, course letter grades are translated into a four-point numeric scale. Table 1 displays the numeric values used and shows the distribution of course grades for students enrolled in the online delivery method for Introduction to the Health Record. A total of 15 (75%) students achieved an “A” grade for the course. A total of 2 (10%) failed the course.

Table 1

Student Grades Earned in the Online Delivery Method for Introduction to the Health Record

Grade	Point Value	Frequency	Percent
A	4.00	15	75
A-	3.67 - 3.99	1	5
B+	3.33 - 3.66	1	5
B-	2.67 - 2.99	1	5
C+	2.33 - 2.66	0	0
C-	2.00 - 2.32	0	0
D+	1.33 - 1.66	0	0
D+	1.00 - 1.31	0	0
D-	0.67 - 0.99	0	0
F/WF	0.00 - 0.66	2	10
Total		20	100

Table 2 displays the numeric values used and shows the distribution of course grades for students enrolled in the traditional delivery method for Introduction to the Health Record. A total of 13 (65%) students achieved an “A” in the course. There were 3 (15%) students who earned an “A-” and two that earned a “B+” (10%), followed by a tie between the letter grade “B-” and “C+” (5%).

Table 2

Student Grades Earned in the Traditional Delivery Method for Introduction to the Health Record

Grade	Point Value	Frequency	Percent
A	4.00	13	65
A-	3.67 - 3.99	3	15
B+	3.33 - 3.66	2	10
B-	2.67 - 2.99	1	5
C+	2.33 - 2.66	1	5
C-	2.00 - 2.32	0	0
D+	1.33 - 1.66	0	0
D+	1.00 - 1.31	0	0
D-	0.67 - 0.99	0	0
F/WF	0.00 - 0.66	0	0
Total		20	100

Table 3 displays the numeric values used and shows the distribution of course grades for students enrolled in the online delivery method for Medical Insurance and Billing. All 5 (100%) students in the course received an “A”.

Table 3

Student Grades Earned in the Online Delivery Method for Medical Insurance and Billing

Grade	Point Value	Frequency	Percent
A	4.00	5	100
A-	3.67 - 3.99	0	0
B+	3.33 - 3.66	0	0
B-	2.67 - 2.99	0	0
C+	2.33 - 2.66	0	0
C-	2.00 - 2.32	0	0
D+	1.33 - 1.66	0	0
D+	1.00 - 1.31	0	0
D-	0.67 - 0.99	0	0
F/WF	0.00 - 0.66	0	0
Total		5	100

Table 4 displays the numeric values used and shows the distribution of course grades for students enrolled in the traditional delivery method for Medical Insurance and Billing. A total of 15 (57.6%) students achieved an “A” followed by 2 (7.7%) students who earned a “B+” and a “C+”. There were 3 (11.5%) students who earned a “B-” and “C-”.

Table 4

Student Grades Earned in the Traditional Delivery Method for Medical Insurance and Billing

Grade	Point Value	Frequency	Percent
A	4.00	15.0	57.6
A-	3.67 - 3.99	0	0
B+	3.33 - 3.66	2.0	7.7
B-	2.67 - 2.99	3.0	11.5
C+	2.33 - 2.66	2.0	7.7
C-	2.00 - 2.32	3.0	11.5
D+	1.33 - 1.66	0	0
D+	1.00 - 1.31	0	0
D-	0.67 - 0.99	0	0
F/WF	0.00 - 0.66	0	0
Total		25	100

Table 5 contains a grade analysis between students enrolled in the traditional and online delivery method. The standard deviation between students will be compared between the groups. The mean grades among the two groups are very similar, while the standard deviation indicated a slight difference.

Table 5

Grade Analysis between Traditional and Online Delivery Method

Delivery Method	Number of Students	Mean Grade	Std. Dev.
Traditional	45	3.31	0.30
Online	25	3.34	0.42

Does age play a role with respect to student success in both online delivery courses and on-campus HIT program courses?

Table 6 is a breakdown of students by age group and delivery method. Four distinct age groups are created to simplify the analysis of the data. The four age groups are: ≤ 21 , 22-30, 31-40 and ≥ 41 . The largest number of participants, 30 (43%) for this study comes from the ≥ 41 age group. The least number of participants 3 (4%) comes from ≤ 21 age group.

Table 6

Breakdown of Students by Age group and Delivery Method

Age Group	Traditional	Online	Total
≤ 21	0	3	3
22-30	13	6	19
31-40	12	6	18
≥ 41	20	10	30
Total	45	25	70

Table 7 shows the breakdown of course grades based on age groups from the online delivery method of Introduction to the Health Record course. This is divided into four distinct age groups to simplify the data analysis. There were 16 students who earned an “A” from each of the age categories. Two students earned a “B” and two earned an “F”.

Table 7

Grade Distribution based on Age Group in the Online Delivery Method in Introduction to the Health Record.

Grade Earned	<21	22-30	31-40	>41	Total
A	3	5	4	4	16
A-	0	0	0	0	0
B+	0	0	0	0	0
B	0	0	1	1	2
B-	0	0	0	0	0
C+	0	0	0	0	0
C	0	0	0	0	0
C-	0	0	0	0	0
D+	0	0	0	0	0
D+	0	0	0	0	0
D-	0	0	0	0	0
F/WF	0	1	0	1	2
Total	3	6	5	6	20

Table 8 shows the breakdown of course grades based on age groups from the traditional delivery method in the Introduction to the Health Record course. This is divided into four distinct age groups to simplify the data analysis. Sixteen students earned an “A” from each category and 4 students earned a “B”.

Table 8

Grade Distribution based on Age Group in the Traditional Delivery Method in Introduction to the Health Record.

Grade Earned	<21	22-30	31-40	>41	Total
A	1	3	6	3	13
A-	0	1	1	1	3
B+	0	1	0	1	2
B	0	0	0	1	1
B-	0	1	0	0	1
C+	0	0	0	0	0
C	0	0	0	0	0
C-	0	0	0	0	0
D+	0	0	0	0	0
D+	0	0	0	0	0
D-	0	0	0	0	0
F/WF	0	0	0	0	0
Total	1	6	7	6	20

Table 9 shows the breakdown of course grades based on age groups from the online delivery method in the Medical Insurance and Billing course. This is divided into four distinct age groups to simplify the data analysis. All five students earned an “A” from the 31 to greater than 41 age categories.

Table 9

Grade Distribution based on Age Group in the Online Delivery Method in Medical Insurance and Billing.

Grade Earned	<21	22-30	31-40	>41	Total
A	0	0	1	4	5
A-	0	0	0	0	0
B+	0	0	0	0	0
B	0	0	0	0	0
B-	0	0	0	0	0
C+	0	0	0	0	0
C	0	0	0	0	0
C-	0	0	0	0	0
D+	0	0	0	0	0
D+	0	0	0	0	0
D-	0	0	0	0	0
F/WF	0	0	0	0	0
Total	0	0	1	4	5

Table 10 shows the breakdown of course grades based on age groups from the traditional delivery method in the Medical Insurance and Billing course. Fifteen students earned an “A” in the 22 to greater than 41 age categories. Seven students earned a “B” in the 22 to greater than 41 age categories and 3 earned a “C” in the 22 to 40 age categories.

Table 10

Grade Distribution based on Age Group in the Traditional Delivery Method in Medical Insurance and Billing.

Grade Earned	<21	22-30	31-40	>41	Total
A	0	2	2	10	14
A-	0	0	1	0	1
B+	0	0	0	2	2
B	0	2	0	1	3
B-	0	0	1	1	2
C+	0	2	1	0	3
C	0	0	0	0	0
C-	0	0	0	0	0
D+	0	0	0	0	0
D+	0	0	0	0	0
D-	0	0	0	0	0
F/WF	0	0	0	0	0
Total	0	6	5	14	25

Does current cumulative GPA play a role to student success in both online learning courses and on-campus HIT program courses?

Table 11 shows the current grade point average of students and the grade earned in the online delivery method of the Introduction to the Health Record course. The results indicate a student's current grade point average is an indicator of the type of grade they will earn in the course. Four of the students in the 3.5 – 4.0 grade point average earned a grade higher than their current grade point average.

Table 11

Grade Point Average and Grade Earned in the Online Delivery Method in Introduction to the Health Record.

Grade Earned	Grade Point			
	2.0 - 2.4	2.5 - 2.9	3.0 - 3.4	3.5 - 4.0
A	0	0	0	14
A-	0	0	1	1
B+	0	0	1	0
B	0	0	1	0
B-	0	0	0	0
C+	0	0	0	0
C	0	0	0	0
C-	0	0	0	0
D+	0	0	0	0
D+	0	0	0	0
D-	0	0	0	0
F	2	0	0	0
W	0	0	0	0

Table 12 shows the current grade point average of students and the grade earned in the online delivery method of the Medical Insurance and Billing course. The results indicate a student's current grade point average is an indicator of the type of grade they will earn in the course. All five students who earned an "A" had a minimum grade point average of 3.5 or better.

Table 12

Grade Point Average and Grade Earned in the Online Delivery Method of the Medical Insurance and Billing course.

Grade Earned	Grade Point			
	2.0 - 2.4	2.5 - 2.9	3.0 - 3.4	3.5 - 4.0
A	0	0	0	4
A-	0	0	0	1
B+	0	0	0	0
B	0	0	0	0
B-	0	0	0	0
C+	0	0	0	0
C	0	0	0	0
C-	0	0	0	0
D+	0	0	0	0
D+	0	0	0	0
D-	0	0	0	0
F	0	0	0	0
W	0	0	0	0

Table 13 shows the current grade point average of students and the grade earned in the traditional delivery method of the Introduction to the Health Record course. The results indicate a student's current grade point average is an indicator of the type of grade they will earn in the course. Two of the students in the 3.5 – 4.0 grade point average earned a grade higher than their current grade point average.

Table 13

Grade Point Average and Grade Earned in the Traditional Delivery Method in Introduction to the Health Record.

Grade Earned	Grade Point			
	2.0 - 2.4	2.5 - 2.9	3.0 - 3.4	3.5 - 4.0
A	0	0	0	13
A-	0	0	0	3
B+	0	0	2	0
B	0	0	1	0
B-	0	0	1	0
C+	0	0	0	0
C	0	0	0	0
C-	0	0	0	0
D+	0	0	0	0
D+	0	0	0	0
D-	0	0	0	0
F	0	0	0	0
W	0	0	0	0

Table 14 shows the current grade point average of students and the grade earned in the traditional delivery method of the Medical Insurance and Billing course. The results indicate a student's current grade point average is an indicator of the type of grade they will earn in the course. More than half of the students in the 3.0 – 3.4 grade point average earned a grade higher than their current grade point average.

Table 14

Grade Point Average and Grade Earned in the Traditional Delivery Method of the Medical Insurance and Billing course.

Grade Earned	Grade Point			
	2.0 - 2.4	2.5 - 2.9	3.0 - 3.4	3.5 - 4.0
A	0	0	0	14
A-	0	0	0	1
B+	0	0	2	0
B	0	0	3	0
B-	0	0	2	0
C+	0	3	0	0
C	0	0	0	0
C-	0	0	0	0
D+	0	0	0	0
D+	0	0	0	0
D-	0	0	0	0
F	0	0	0	0
W	0	0	0	0

Table 15 outlines the grades by delivery method and age group. The purpose of this test was to assess student performance based on the age of the student. Upon review of this table, there is a difference in performance in the various age categories. Those students in the 22-30 age category in the online delivery method displayed the lowest mean performance (2.91) among all groups. The online students in the 31-40 age category displayed the highest mean performance.

Table 15

Grades by Delivery Method and Age Group

	Age Group				Total
	≤21	22-30	31-40	≥41	
Traditional Count	0	13	12	20	45
Traditional Mean	0	3.21	3.38	3.35	3.31
Traditional Std. Dev.	0	0.37	0.29	0.22	0.29
Online Count	3	6	6	10	25
Online Mean	3.5	2.91	3.41	3.1	3.23
Online Std. Dev.	0	1.30	0.18	1.04	0.84

Table 16 outlines ANOVA grades by delivery method and age group. A two-way analysis of variance on grades with age category and delivery mechanism used as the independent variables. There is no statistical difference between the grades of the two delivery methods by age groups.

Table 16

ANOVA of Grades by Delivery Method and Age Group

Source of Variance	Sum of Squares	df	Mean Square	F	P
Main Effects (Traditional delivery)	0.218	2	0.109	1.314	0.280
Mechanism Main Effects (Online delivery)	1.126	3	0.375	0.430	0.734
Mechanism Main Effects (Combined age)	0.103	1	0.103	0.137	0.712

Table 17 outlines ANOVA grades by delivery method and cumulative GPA. The data displays the combined GPA for each delivery method. There is no significant variance between the delivery methods.

Table 17

ANOVA of Grades by Delivery Method and Cumulative GPA

Source of Variance	Sum of Squares	df	Mean Square	F	P
Main Effects (Combined GPA)	0.034	1	0.034	0.293	0.590

How do completion rates differ in an online delivery course compared to an on-campus delivery course?

As indicated in Tables 2 and 4 there were a total of 45 traditional delivery method students of which 7% did not successfully complete the course. The online delivery method in Tables 1 and 3 showed that 8% ($n = 25$) did not successfully complete the course.

Chapter Summary

The results of this study indicate that overall there is no difference in an online delivery course compared to an on-campus delivery course. With respect to the age of the student, the biggest discrepancy was in the 22-30 year old category where they performed better in a traditional course than an online course. A student's cumulative GPA (at the time they took the course) appears to be a factor in predicting student performance in a course. In Chapter 5 you will find a summary of the research project, conclusions, and recommendations from the researcher.

Chapter V: Discussion

In this study, the research sought to discover whether students enrolled in the Health Information Technology (HIT) program at Chippewa Valley Technical College (CVTC) performed any differently online as they did in a face-to-face course. The effectiveness of student learning was measured by the grade earned by the student. The subjects of this study were those students that were enrolled in and completed face-to-face and online HIT courses at CVTC.

Chapter five provides a summary of the research findings. Conclusions are discussed and recommendations made about the performance of HIT students in an online versus face-to-face course at Chippewa Valley Technical College.

Summary and Conclusions

The participants in this study consisted of 40 students who enrolled in the Introduction to the Health Record course for spring and fall 2011 and 30 students who enrolled in the Medical Insurance and Billing course for fall 2006 and spring 2009. The age of the students ranged from 19 to 57 years old. Forty five students were enrolled in the traditional classroom course and 25 students were enrolled in the online course.

The four research questions are addressed below.

Research Question 1. How do HIT program students perform in an online delivery course compared to an on-campus delivery course? Overall there is no difference in an online delivery course compared to the on-campus course. The overall traditional mean was 3.31 compared to the online mean 3.23.

Research Question 2. Does age play a role with respect to student success in both online delivery courses and on-campus HIT program courses? The biggest discrepancy was in

the 22-30 year old category where they performed better in a traditional course than an online course. Further study could be done on this age group to determine the factors that affect their performance in a traditional versus online course.

Research Question 3. Does current cumulative GPA play a role to student success in both online learning courses and on-campus HIT program courses? There is no significant variance between the delivery methods. A student's cumulative GPA (at the time they took the course) appears to be a factor in predicting student performance in a course. On the other hand, 14.2% of the students earned a grade higher than their current grade point average in both online and face-to-face courses.

Research Question 4. How do completion rates differ in an online delivery course compared to an on-campus delivery course? Successful completion rate according to the HIT program grading scales is defined as a C or above. There were three students who received a C- in the traditional delivery method and two students that received an F in the online delivery method. The two students who failed did not perform poorly; they stopped attending class, but did not officially withdraw from the course.

Recommendations

Results of this study were consistent with findings discovered in the literature and showed that students perform equally as well in the traditional and online delivery methods. As a result, the online courses should be continued to be offered within the HIT Department at CVTC. While this study was limited to HIT students who took either the traditional or online offering of Introduction to the Health Record and Medical Insurance and Billing course, the results may or may not be applicable to other programs offered at Chippewa Valley Technical College.

Recommendations based on these findings would be that further research would be beneficial to determine why the 22-30 year olds performed better in a traditional course than an online course. As a result of this survey, I would include a larger analysis of another course to increase the reliability of the data. The online Medical Insurance and Billing course only had 5 HIT students enrolled.

A history of research findings support the academic leaders' beliefs by indicating no significant differences between the effectiveness of online courses compared with traditional face-to-face classes (Clark 2002, Phye, 1997). While a great deal of research compares distance education, its many varieties and technologies, with on-site education, the outcomes are not clearly defined. The majority of studies focus on overall grades (Derwin, 2009). Such research does not address outcomes for tasks that require critical thinking skills. Yes, educators and theorists acknowledge the importance of critical thinking as an essential learning outcome to achieve quality learning (Wickersham & Dooley, 2006).

The instructor is able to monitor activities within a classroom setting and facilitate the learning process in a hands-on manner. Online learning, on the other hand, insists that the student be self-motivated, more organized, and possess better time management skills because of the relationship between student success and time-on-task (Shyu & Brown, 1992). As a result of this, educators need to be conscious of how to better assist online students who tend to lose focus and get off track during the course. Education concerning online learning effectiveness and a continued understanding of adult learning theory and learning styles needs to be emphasized among faculty (Aragon, Johnson & Shaik, 2000). This may help students remain on task and perform better in an online course.

Results of this study were consistent with findings discovered in the literature review which showed that a higher percentage of students that participated in an online course dropped out compared to students in a traditional delivery method.

It is my recommendation that student engagement and retention surveys be conducted to online delivery methods in the HIT course offerings at CVTC. It is my recommendation that as additional courses are adapted to online delivery, this study should be repeated both in other HIT courses and throughout CVTC to prove reliability.

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