Demographic Analysis of the Wisconsin Technical College System

Nontraditional Course Student Population

based on Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College Data

by

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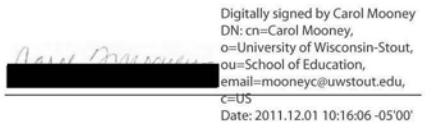

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ABSTRACT

The purpose of this study was to create a demographic profile of the Wisconsin Technical College System (WTCS) nontraditional delivery course students in order to support strategic prioritization in converting traditional courses to alternate formats. This goal was achieved via analysis of the demographic makeup of the courses delivered in online, blended, videoconference and self-paced telecourse modes at the four largest WTCS districts. Namely, this research examined the age, gender, ethnicity and minority status characteristics of Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College learners based on official enrollment and course completion reporting data. The analysis performed lead to conclusions regarding the WTCS system's nontraditional course target audience and recommendations were made regarding the utility of the findings for determining priorities in transferring traditional courses to web-based delivery.

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Chapter I: Introduction

Overview

The purpose of this study was to create a demographic profile of the Wisconsin Technical College System (WTCS) nontraditional delivery course students in order to support strategic prioritization in converting traditional courses to alternate formats. This goal was achieved via analysis of the demographic makeup of the nontraditional courses delivered via online, blended, videoconference and self-paced telecourse modes at the four largest WTCS districts. Namely, this research examined the age, gender, ethnicity and minority status characteristics of Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College learners based on official enrollment and completion reporting data. The analysis performed lead to conclusions on learner characteristics affecting success rates in nontraditional technical college courses and to recommendations regarding the utility of the findings for prioritizing the transfer of traditional courses to web-based delivery.

The Wisconsin Technical College System's stated mission is to be "the premier provider of technical education committed to extending learning beyond the classroom and throughout life" (WTCS, 2011). The system represented by a network of 16 individual technical college institutions serving scattered geographic areas throughout the state has proven its commitment to the mission via a long history of serving working adults via flexible, learner focused alternative delivery options that include accelerated, blended and online coursework (Kittelson, 2010).

The official WTCS Enrollment Report showed that current nontraditional enrollments represent approximately 11% of total students served or a 45,000 headcount (WTCS, 2009). The nontraditional course category involved all delivery modes involving distance technologies,

including online, blended, videoconference and self-paced telecourse deliveries and excluded only the traditional face-to-face classroom courses. As a result of a steadily increasing percentage rate hundreds of new courses have been redesigned for computer aided delivery over the years. Even though a large literature base was available on how to transition career and technical education (CTE) coursework into cyberspace, system level success rates experienced varying success rates (Bogner & Cady, 2010). Some departments enjoyed significantly increased participation as a result of these alternative learning options, while programs in other industry areas struggled consistently.

Over time, improvements have been made in web accessibility, computer software systems, online course design and faculty development, significantly increasing online course effectiveness across the board. Statistical data brought forth user endorsement of online learning (Wilson, 2008) and exponential growth of home broadband adoption essential for this type of coursework (Smith, 2011). New course management systems build in multiple online collaboration tools and hands-on activities assuring higher than ever content assimilation and graduation rates (Darbyshire, 2005). In fact, a study that regarded the effectiveness of web-based course delivery showed that approximately 71% of students enrolled in virtual courses were satisfied with Blackboard, WTCS's official course management tool (Davis, 2010). In addition, WTCS has in place a series of mandated faculty certifications that provide extensive learning opportunities for heightened learner focus and course effectiveness (WTCS, 2011) and the Wisconsin Instructional Design System specifically targets the improvement of occupational education (Key, 1997). As a result, a recent study concluded that 81% of instructors felt adequately trained to deliver effective, learner focused web coursework (Davis, 2010).

However, research on student perceptions of nontraditional courses also showed that diverse student populations perceived the instructional design elements utilized as well as the overall benefits of web-based delivery differently (Sims, 2003) and that examination of these perceptions were essential for recruitment and retention (Thompson, 2007). National studies confirmed that there were more women than men and fewer than proportionately adequate ethnic minorities enrolled in postsecondary online learning (NRCCTE, 2004). In this regard, WTCS Graduate Follow-Up Studies covering the 2001-2010 time period pointed out that approximately 63.9% of graduates were female and minorities represented only about 9.9% of those completing their programs with success (WTCS, 2011). Further analysis lead to the conclusion that percentage rates of success differed depending on age, gender and ethnicity. For example, in the courses analyzed approximately 7.5% of White learners graduated while the completion rates for African Americans and for Asian students were 4.5 % and 7.2 %, with variations across districts. On business course level, WTCS statistics reflected 87% White, 3.3% African American and 2.4% Asian American graduation rates (WTCS, 2011), these findings corresponding to the national conclusions that without targeted support strategies online learning may undercut progression among economically disadvantaged or academically underprepared students.

On the other hand, statistics demonstrated the viability of distance education as a solution for the perpetually wired society's lifelong learning needs. In this regard, national research results proved that courses delivered via nontraditional routes provided a flexible alternative to experienced part-time students who had to balance work and life responsibilities. Additionally, these options expanded the service area of technical college institutions, granting a means for accomplishing the long standing mission of "serving working adults beyond the classroom and throughout life" (WTCS, 2011). In fact, over 77 million adults were taking postsecondary

classes with the average age being 29 years old. We also know that currently workers 55 years and above represent 13% of the total workforce but by 2020 their percentage will increase to 20% while workforce demographics will shift from the existing 73% Whites and 11% Hispanics to 53% and 24% respectively (Harkin, 2003).

Even given all the multifaceted benefits of online career and technical education growth the fact that access to college is difficult to maintain in tough economic times also needs to be considered. As reported in a Measuring Up Report of the National Center for Public Policy in Higher Education, the percentage of working age adults enrolled in any type of postsecondary education has declined 1.8% nationally since 1991 due to reduced affordability (NRCCTE, 2009). Financial aid, as the primary tool for affordability of higher education, was of limited use in the non-traditional vocational student milieu as it was tied to continuous, full-time attendance non-representative for career and technical schools. In fact, national community college reporting showed that approximately 41% of learners were first generation students and 29% of households had less than $20,000 income (NCES, 2006).

Given its pitfalls related to persistence, WTCS administrators must increase awareness around the need for systematic support strategies that allow maximization of the benefits offered by this delivery mode while reducing its weaknesses. These strategies include infrastructure capacity for high quality course design cognizant of different learning styles and diverse perceptions as well as online student support services such as real-time advising or tutoring equivalent to traditional alternatives (HLC, 2010). Finally, in order to assure the future success of WTCS delivered online career and technical education there must be concrete evidence-based demonstration of measured, analyzed and improved program outcomes for each online course (HLC, 2010). Thus, an in-depth analysis of the demographic characteristics of the learner

populations served by each WTCS technical college providing insight on which student categories are most likely to enroll in and successfully complete virtual coursework is essential.

The current lack of understanding of how nontraditional business course enrollment and success rates compare between districts and mirror local demographics represents a significant problem. Although system level variations exist between the 252 business courses offered as far as learning outcome and assessment expectations, affecting completion statistics and acting as a limiting factor of the present study, findings nonetheless will effectively fill the existing knowledge gap relating to the details of this correlation (WTCS, 2011).

This examination is foundational for system level enrollment and success rate forecasting and for correct estimations on priorities for converting traditional WTCS courses to nontraditional delivery. So, while WTCS's Biennial Report emphasized the need for added postsecondary education opportunities via enhanced online learning targeting dislocated and incumbent workers, progression pathways for low income adults and increased minority enrollments (WTCS, 2011), a research conducted by the Community College Research Center in 2010 demonstrated that online coursework lead to lower persistence rates, especially in case of disadvantaged populations (NRCCTE, 2009). Thus this study showed that although online vocational courses allowed wider arrays of populations to access higher education, without appropriate support systems and strategies delivery method alone did not lend desired results.

In a volatile national career and technical education (CTE) environment of reduced budgets and increased competition from private two year institutions, WTCS is at risk of enrollment decreases, program cuts and shattered reputation. System leaders must focus

financial and strategic efforts on the areas that present the highest return on investment and that fit closely with CTE's mission.

Achieving this goal is possible only by clearly understanding the WTCS audience's distinctive needs. Once learner characteristics are identified for each district, data can be analyzed to find similarity and discrepancy trends that affect online business course statistics, the resulting knowledge being beneficial for all stakeholders and especially useful for WTCS decision makers engaged in system wide strategic planning. Ultimately, by helping administrators make well founded, needs based resource allocation decisions, the findings of this study will help improve student and industry perception of the online business education offered by WTCS technical colleges. In the end, only consistent implementation of these continuous online course improvement measures will assure WTCS's success in maintaining its position as Wisconsin's leading postsecondary career and technical education institution and in remaining reputable as a viable and effective learning alternative for future student generations.

Statement of the Problem

At the present time, WTCS faces the problem of not quantifying the impact of learner demographics such as age, gender, ethnicity and minority status on the overall enrollment and success rates in nontraditional courses including online, blended, videoconference and self-paced telecourse delivery modes. Without a clear understanding of the correlation existent between student characteristics and online course success, administrators are forced to transfer programs of study to virtual delivery randomly, without strategic focus or prioritization. This approach, however, results in inefficient use of resources as well as risk of decreased enrollments in courses that by their flexible and convenience could satisfy career and technical education's

ultimate purpose of "extending learning beyond the classroom and throughout life" (WTCS, 2011).

The present study aimed to solve this problem by reaching conclusions on the characteristics of current and future nontraditional course enrollees. The analysis evaluated publicly available WTCS data on district student population demographics as well as correlated trends in enrollments and success rates, providing relevant information for WTCS administrators for determining the courses that are most desirable for transfer to virtual delivery.

In essence, the purpose of this study was to create a demographic profile of the Wisconsin Technical College System (WTCS) nontraditional course students, helping administrators make effective strategic decisions about priorities for converting courses to web-based delivery. More specifically, the research provided the data-based evidence needed for understanding the demographic makeup of WTCS program audiences as well as the relationship between enrollment and success rates. The analysis performed lead to conclusions on learner characteristics ending with recommendations regarding use of the collected data in determining WTCS program transfer priorities to the virtual environment with improved student success in mind.

Research Questions

Questions addressed by this study related to understanding the demographic makeup of the nontraditional WTCS course audience. Upon completion of the steps involved in answering the two research questions listed below conclusions were drawn regarding the benefits of using this data for prioritizing the transfer of traditional courses to the virtual environment.

Research Question 1: What are the demographic characteristics of students enrolling in nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College?

Steps for answering this first research question related to the selection of the research sample comprised of the four largest WTCS technical colleges based on full-time enrollments, namely Madison, Milwaukee, Fox Valley and NWTC, of a compilation of their demographic data based on WTCS system reports and a comparison analysis between districts. Enrollment data from the four sampled districts was analyzed to determine percentage rates per age group, gender, ethnic category and minority status for each of the four districts as well as an aggregate for the entire sample. A district level trend analysis was performed to visualize evolution of enrollments rates, the results being complied into a single database for comparison and contrast investigation. To determine the differences across the sample, a crosstab chi-square analysis was performed for each academic year including age category, gender, ethnicity and minority status by district.

Research Question 2: What are the demographic characteristics of students completing nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College?

This section concerned the analysis of sample level success rates using cross tab chi-square testing for each of the four districts. The investigation looked to determine whether success rate differences existed between districts by age category for each academic year or across all years. A cross tab chi-square analysis for the differences by age group, gender and by

ethnicity for each institution and for individual and combined academic periods concluded the graduating student data examination.

Definition of Terms

To provide credibility and assure generalized reader understanding, the specialized terms utilized in this research study were defined as follows:

Asynchronous Learning: Asynchronous learning is learning in which there is no time requirement for transmission (Merriam-Webster Online Dictionary, 2011).

Autonomy: Autonomy is the state of being self-governing as it relates to learning (Merriam-Webster Online Dictionary, 2011).

Blackboard: Blackboard is software that provides a course management system used for educational instruction, communication and assessment (Bradford et al., 2007).

Blended Learning: Blended learning requires both online learning and in-person class meetings (NWTC, 2011).

Collaboration: Collaboration means to work jointly with others especially in an intellectual endeavor (Merriam-Webster Online Dictionary, 2011).

Demographics: Demographics are the demographic data used especially to identify consumer markets (Merriam-Webster Online Dictionary, 2011).

Distance Learning: Distance learning is a type of instruction in which student and instructor are separated by physical distance (not in the same room) (O'Lawrence, 2006).

Interactive Television: Interactive television is a modern telecommunications system that allows students to take classes from different locations and interact with instructors continually throughout the class time (NWTC, 2011).

Online: Being online is the act of being connected to, served by or available through a system and especially a computer or telecommunications system, such as the Internet (Merriam-Webster Online Dictionary, 2011).

Online Learning: Online learning is a method of learning delivered by using asynchronous and synchronous learning communication technologies (Akyol et al., 2009).

Synchronous Learning: Synchronous learning is learning taking place at precisely the same time (Merriam-Webster Online Dictionary, 2011).

Technology: Technology is the manner of accomplishing a task especially using technical processes, methods or knowledge (Merriam-Webster Online Dictionary, 2011).

Telecourse: Telecourse courses are self-paced print based correspondence courses which can be completed via mailed instructional packets and a textbook (NWTC, 2011).

Tool: A tool is an instrument, apparatus or computer program used in performing an operation or necessary in the practice of a vocation or profession (Merriam-Webster Online Dictionary, 2011).

Virtual Environment: The virtual environment is a single platform and gateway that connects students and academia to a network that can be used for learning materials and activities (Bach et al., 2007).

Assumptions of the Study

This research study assumed that the statistical information presented in the data reports utilized for analysis were based on truthful student declarations regarding their age, ethnicity and socio-economic status and that the information was correctly entered and processed. Similarly, it was considered that the student populations enrolling in nontraditional technical college courses

possessed appropriate understanding of the demographic and educational terminology to correctly complete the registration form categories relevant for the outcomes of this study.

Limitations of the Study

The limitations of the study related to the sources, scope and methodologies applied in this analysis. Generally speaking, the data utilized was restricted to the publicly available WTCS System Attic data reports, the study omitting data and studies unavailable via this public online venue. The data analysis and results of this study regarded only the Wisconsin Technical College System's nontraditional delivery courses and the findings may not be applied to courses of other state or national technical or community colleges. Additionally, web-based course satisfaction and success rates depend on the capabilities of the course management system, the resulting findings being unsuitable for extrapolation to other online delivery systems and districts have slightly divergent learning outcome expectations which, although affect success rate statistics, were ignored for the purposes of this study. Specific methodology related limitations were the possibility of lost or interrupted connectivity with the main WTCS System Attic data source resulting in partially outdated figures. Furthermore the course completion data has been filtered to show two specific completion codes only, namely code one for a passing grade and completion code two received for failing a course. As a result, for the purposes of this study, completion codes showing withdrawals, transfers, etc. were omitted. Finally, it is possible that, over time, certain reporting categories could be changed or removed entirely by WTCS officials, resulting in the inability of replicating the foundational sources of the present research.

Chapter II: Literature Review

Introduction

The purpose of this study was to create a demographic profile of the Wisconsin Technical College System (WTCS) nontraditional delivery course audience in order to support strategic prioritization in converting traditional courses to alternate formats. This goal was achieved via analysis of the demographic makeup of the nontraditional courses delivered at the four largest WTCS districts. Namely, this research examined the age, gender, ethnicity and minority status characteristics of Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College learners based on official enrollment and completion reporting data. The analysis performed lead to conclusions on learner characteristics affecting success rates in nontraditional technical college courses and to recommendations regarding the utility of the findings for prioritizing the transfer of traditional courses to web-based delivery.

Chapter II - Literature Review is an overview of the existing research related to web-based career and technical education. The review created the study's context justifying both its relevance and its methodology and explained the general evolution of nontraditional vocational education as well as the course design aspects pertinent to student success. The literature assessment also analyzed WTCS wide enrollment and graduation reports and documents, summarizing and linking findings to the research study at hand.

Evolution of Nontraditional Career and Technical Education

Career and technical education, defined as "education that prepares individuals for employment and / or continuing education so that learners of all ages fulfill their working potential" (Scott, 2008) is rooted in manual vocational training (Woodward, 1890). Over the decades, career and technical education's mission and strategies evolved, now being a type of

inclusive, flexible and practical instruction that focuses on serving target populations. Although affected by many divergent forces, some of the most significant influencing factors affecting vocational education were induced by recent technology advancements that make distance learning possible and by the increased diversity of the learner audience.

Distance learning, a form of education in which one self-regulates progression, is an increasingly reliant on modern technologies for connecting instructors and students with their resources and with each other (Herlihy, 2007). Over time, improvements have been made in web accessibility, computer software systems, online course design and faculty development, significantly increasing web-based course effectiveness across the board. Statistical data brought forth user endorsement of online learning (Wilson, 2008) and the exponential growth of home broadband adoption essential for this type of coursework (Smith, 2011). Newer course management systems build in multiple online collaboration tools and hands-on activities assuring higher than ever content assimilation and graduation rates (Darbyshire, 2005). The virtual course strategy in general is a viable solution for the lifelong learning needs of technical college students. Online options expand the service area of technical college institutions, presenting a means for accomplishing the long standing vocational education mission of "serving working adults beyond the classroom and throughout life" (WTCS, 2011) and increasing access and retention via the specific benefits they provide. National research results proved that these courses with their benefits related to education on demand, opportunity for lifelong learning, extended school year and flexibility for all generations and were a good alternative for experienced part-time students who needed to balance work and life responsibilities. In fact, the meta-analysis sponsored by the United States Department of Education concluded that in many cases learning outcomes in online courses were superior to those in traditional face-to-face

courses especially for students entering relatively well prepared academically and technologically (NRCCTE, 2009).

On the other hand, the evolution of nontraditional career and technical education has been slowed by tough economic climates, reduced affordability being quoted as the top reason for the past decade's 1.8% decline in working age adults enrolled in any type of postsecondary education. The report conducted by the National Center for Public Policy in Higher Education in 2009 explained that financial aid, the primary tool for affordability of higher education, was of limited use in the non-traditional vocational student milieu as it was tied to continuous, full-time attendance non-representative for technical schools (NRCCTE, 2004).

The success of nontraditionally delivered education was also dependent on the quality of on communication between the instructor and the learners. A research conducted by Moore and Kearsley (2005) determined that the ability or lack thereof to communicate with course technology, participants and instructor was a main barriers to enrollment and graduation (Lee & Rha, 2009). Bach's study on virtual learning supported this finding revealing that the major constraints to nontraditional course student success related to not being able to work effectively within course design or with the technology supporting the delivery. It also showed that it should not be assumed that students come equipped with the necessary skills and knowledge for using learning technology. The investigator explained that web-based learning effectiveness was correlated with strong support systems that helped students start and remain on a successful track and concluded that to prevent dropout, online coursework needed to be supported by human contact tutoring and effective technology help (Bach, 2007).

According to Lorenzetti (2005), in order to improve nontraditional teaching and learning effectiveness, educators must assess the student's readiness for virtual coursework, communicate

frequently and efficiently, rely on materials available online, use selective course platforms and design elements, relate well to students' real field experiences and focus on retention proactively via targeted support measures. He stated that the consistent application of these measures result in more engaged students and higher course retention rates (Lorenzetti, 2005).

Yet another aspect shown related to of career and technical education's evolution is the fact that technical colleges work with non-traditional student populations. National community college reporting indicated that among the 77 million adults taking postsecondary classes the average age was 29 years old, 35% of postsecondary technical college students had children 17% being single parents. Overall, 79% of learners worked full-time in addition to taking college classes, approximately 41% were first generation students and 29% of enrollee households had less than $20,000 income (NCES, 2006), leading to varied perceptions even within the same web-based course construct. Research illustrated that diverse student populations perceived instructional design elements differently (Sims, 2003) and that examination of these perceptions was essential for recruitment and retention (Thompson, 2007). On this, Tsai (2007) explored student's use of the Internet via the 4T – Technology, Tool, Toy and Tour approach. His research showed that students perceived the web as a tool rather than a technology and that their perception played a role in their learning preferences. For those focused on usability content was more important while for learners interested in capabilities supporting mechanisms and technological advancements were more relevant. Tsai concluded that "students with a tour perception tend to express better attitudes toward Internet based learning" (Tsai, 2007).

The above research exposed that career and technical education delivered via online, blended, videoconference and self-paced telecourse modalities faced the challenge of diverse student groups needing multiple teaching approaches. Students increasingly saw education as a

component of their time alongside their regular social and economic activities, family and work (Bach, 2007), this aspect tying back directly to modern technologies accommodating such combined and flexible routines. But, at the same time, as Bach (2007) pointed out "time becomes a more and more limited commodity" making the quality of education received a focal issue. Both teaching contact and online resources are at center point of helping learners maximize the limited time spent on schoolwork. The researcher concluded that the role of today's educator is facilitation of understanding of core concepts and access to valuable private study resources that promote independent student learning (Bach, 2007).

Taken as a whole, the literature review presented that modern technology aided, learner lead instruction career and technical education strategies needed to focus on staying current with changing demands and accepting a future linked to online technical coursework. Supporting evidence came in form of a study conducted on more than 2,500 educational institutions revealing that web-based enrollment rose by almost one million students in the 2009-2010 academic year representing the largest year-to-year increase ever. The research also exposed that sixty-three percent of all reporting institutions considered online learning a critical part of their long term strategy and that the economic downturn increased demand for online programs (Faculty Focus, 2010). According to another study nearly all types of higher education institutions showed considerable growth in virtual course offerings also noting that two-year associate degree institutions having the largest online course increase rates (Allen, 2007).

Wisconsin Technical College System Nontraditional Courses

The Wisconsin Technical College System's stated mission is to be "the premier provider of technical education committed to extending learning beyond the classroom and throughout life" (WTCS, 2011). The system represented by a network of 16 individual technical college

institutions serving scattered geographic areas throughout the state proved its commitment to its mission via a long history of serving working adults via flexible, learner focused alternative delivery options that include accelerated, blended and online coursework. One resources showed that the system's main target audience was made up of working adults who return for additional degrees or retraining, the top reasons for enrollment was 5% personal reasons, 7% miscellaneous reasons, 9% improved job skills, 20% career change, 21% continuing education and 38% employment preparation (Kittelson, 2010).

Among the students served by the WTCS districts diversity was omnipresent and widespread. Recent research projects showed that the typical postsecondary students are no longer White males but racially, ethnically diverse, generationally and economically diverse individuals who collaborated and learned in a mutually inclusive environment (Taynton, 2000). The study pointed out that with nontraditional student audiences come new perspectives such as differences in knowledge and experience level as well as work and family commitments that add on to schoolwork. In this environment, WTCS administrators had to consider distant delivery options not only from the perspective of flexibility but also from the viewpoint that many students had little if any previous computer contact and thus struggled with basic technologies such as email or website access. Millennial students often assumed to be very computer savvy also faced challenges in online learning as attending distant courses meant isolation from friends and a constant juggle between work and self directed study responsibilities. These aspects, the study concluded, were very real barriers to online student success (Taynton, 2000).

The WTCS Enrollment Report (2009) showed that current nontraditional enrollments represent approximately 11% of total students served or a 45,000 headcount and that this percentage rate was steadily increasing. This number was made up of varied populations who

chose this delivery method either because of its timeline flexibility or due to its accessibility. The same report pointed out that at state level the distance course student population was represented by 83% females out of which 90% were working toward a degree or certificate, 83% of these students were employed, 43% lived further than 20 minutes from their local technical college and 49% were between age twenty-six to forty-five (WTCS, 2011). National studies on postsecondary online learning confirmed the WTCS findings of more women than men and fewer than proportionately adequate ethnic minority enrollments in technical colleges. In fact, they pointed out that out of the 77 million adults taking postsecondary classes 73% were White and only about 11% Hispanic (NRCCTE, 2004).

Regarding graduation rates, WTCS Graduate Follow-Up Studies covering the 2001-2010 time period indicated that 97% of graduates were satisfied or very satisfied with the education they received in statewide technical colleges (WTCS, 2011) and they rated online course effectiveness at 71% satisfaction (Davis, 2010). In this aspect WTCS had implemented a series of mandated faculty certifications providing learning opportunities for heightened online student focus and course effectiveness (WTCS, 2011) and the Wisconsin Instructional Design System specifically targets the improvement of occupational education (Key, 1997). As a result, Davis's (2010) study concluded that 81% of nontraditional course instructors felt adequately trained to deliver effective web coursework (Davis, 2010).

However, WTCS Graduate Follow-Up Studies covering the 2001-2010 time period also pointed to the fact that approximately 63.9% of graduates were female and minorities represented about 9.9% of those completing their programs with success (WTCS, 2011). Further analysis lead to the conclusion that percentage rates of success differed depending on age, gender and ethnicity. For example, approximately 7.5 % of White learners graduated while the

completion rates for African Americans and for Asian students were 4.5 % and 7.2 %, with variations across districts. On business course level, WTCS statistics reflected 87% White, 3.3% African American and 2.4% Asian American graduation rates (WTCS, 2011).

In this diverse learner environment induced by virtual space WTCS faced new challenges such as language or time zone differences and student perceptions essential for recruitment and retention (Thompson, 2007). In fact, the very idea of Internet in career and technical education affected how the way future student generations learn and interact (Palloff & Pratt, 2003). Thus WTCS administrators employed systematic support strategies that maximize the benefits of virtually supported distance delivery while reducing its weaknesses. These strategies included infrastructure capacity for high quality course design cognizant of different learning styles and diverse sensitivity as well as online student support services such as real-time advising and tutoring equivalent to traditional alternatives. The Higher Education Commission Report (2010) also showcased the fact that in order to assure future success for statewide online career and technical course delivery, there must be concrete evidence-based demonstration of measured, analyzed and improved program outcomes for online courses as only consistent implementation of these continuous improvement measures can guarantee WTCS's future leading position in postsecondary career and technical education (HLC, 2010).

Summary

This literature review gave an overview of the existing research related to online career and technical education. It focused on the context of the study, explaining the general evolution of vocational education delivered via nontraditional venues as well as the specific aspects relevant for WTCS. The findings showed that there was a need for further analysis of nontraditional course demographics and the correlation between WTCS district statistics and

enrollment and success rates. In conclusion, this review of literature underlined the importance of the present study involved with forecasting priorities for converting traditional WTCS courses to virtual delivery.

Chapter III: Methodology

Introduction

The purpose of this study was to create a demographic profile of the students enrolled in Wisconsin Technical College System's (WTCS) nontraditional delivery courses in order to support strategic prioritization in converting traditional courses to alternate formats. This goal was achieved via analysis of nontraditional course student populations at the four largest WTCS districts. Namely, this research examined the age, gender, ethnicity and minority status characteristics of Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College learners based on official enrollment and completion reporting data.

The present Chapter III - Methodology supports the study objectives by describing in detail essential methodology elements such as research design, sample selection, instrumentation, data collection, data analysis and methodology limitations. Overall, this section laid the foundation for the results analysis found in Chapter IV as well as for the conclusions and recommendations presented in Chapter V regarding using the findings for determining priorities in transferring WTCS courses to web based formats.

Research Design

This study evaluated the current demographic makeup of the nontraditional WTCS courses using quantitative descriptive research design to gather information regarding the "current status of the phenomena in order to describe what currently exists with respect to variables or conditions in a situation" (Key, 1997). Quantitative research is the approach in which the measuring instruments emphasized are those that produce numerical data and in which the results of the investigation are presented as quantities or statistics (Patten, 2005). In the

context of this study the descriptive quantitative approach assisted in compiling and analyzing statistical data found in official WTCS System Attic reports for purpose of building the desired demographic profile.

Sample Selection and Description

The research population consisted of students enrolled in nontraditional courses offered by the sixteen Wisconsin Technical College System districts. According to the official WTCS Enrollment Reports this population headcount was 266451 students measured by full-time equivalent enrollments representing a significant percentage rate of the total students served by the technical college system.

The sample utilized for this study was purposefully selected to include the four largest WTCS institutions by full time equivalent enrollments, namely the Madison Area, Milwaukee, Fox Valley and Northeast Wisconsin Technical Colleges. The 2010 enrollment numbers of these four districts were 50231, 105257, 49928 and 61035 respectively showing that indeed these four districts continue to maintain their leading position within the WTCS.

The demographic composition of the studied four colleges was representative of the research population. The cumulative aggregates of Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College represented a significant percentage rate of the system's total full-time equivalent enrollments, the sample population's demographic characteristics allowing for valid generalizations from sample to population based on both size and diversity attributes.

Finally, the four districts selected for analysis were comparable in size amongst each other allowing for comparison analysis between district level data. Specifically, the 2010

enrollment numbers for the Madison Area district were 50231, Milwaukee were105257, Fox Valley were 49928 while NWTC showed 61035.

Instrumentation

The master instrument for collecting the data necessary for this research was an excel pivot table connected to the main WTCS system database. The tool had a complex design, allowing sorting with filters such as technical college district, course delivery method, business program, academic year, learner age group, diversity category, course completion status, etc. The pivot table was constructed in a manner that allows visualization of the filters as well as the column and row headings applied, making navigation and sorting relatively self-explanatory. Although no measures of validity or reliability have been documented since this instrument was designed specifically for this study, it was reasonable to believe that the validity and reliability of the data returned by this pivot table equaled that of the WTCS system wide reporting drawing upon the central database via an interactive online connection.

The specific pivot table settings generating data for this analysis included filters on technical college district, academic year, delivery mode, student age, completion code and demographic variables analyzed. The main WTCS database was queried to retrieve course enrollment and completion data for the four largest technical college districts, namely Madison, Milwaukee, Fox Valley and NWTC for the past six academic years, for students 18 years or older enrolled in any of the non-traditional delivery modes coded generically with code four by the WTCS system reports. The demographic variables analyzed regarded age, age category, gender, ethnicity and minority or non-minority status and the course completion data retrieved only completion code one representing success and completion code two showing failure. This

instrumentation tool was foundational for the study's data collection and analysis and was essential part of the research design as its specific structure aided the researcher's ability to draw correct and statistically valid conclusions regarding the research topic.

Data Collection

The present study relied on data collected via WTCS technical college enrollment and graduation reporting systems. Instead of collecting new quantitative or qualitative data it sorted, filtered and combined existing raw records into meaningful information for statistical analysis. The main collection tool represented by the interactive pivot table was in perpetual connection with the main WTCS System Attic database located at the state office, returning current and valid figures at any given time. This data collection method could be replicated by those knowledgeable in pivot table design and with access rights to the WTCS center database.

Data Analysis

The data collected during this research was examined from multiple perspectives and with several statistical tools. Enrollment data from the four sampled districts was analyzed with measures of central tendency relating to elements such as average age and enrollment and completion percentage rates per gender, ethnic category and minority status. These measurements were performed at the level of each of the four districts as well as an aggregate for the entire sample. A district level trend analysis was performed to visualize evolution of enrollments and graduation rates. Average age and enrollment numbers per gender, ethnicity and minority status were visualized for each of the six academic years, 2005 through 2010 in absolute and relative terms, their cumulative percentages showing the evolution trend. The results were complied into a single database for comparison and contrast investigation. To

determine the differences in the demographic characteristics of the students who enroll across the sample, a cross tab chi-square analysis was executed for each academic year including age category, gender and ethnicity by district. Finally another cross tab chi-square test focusing on age category, gender and ethnicity by district was used to analyze the differences without regard to the academic year.

Next, the sample's success rates were analyzed using cross tab chi-square analysis for each of the four districts. The investigation looked to determine whether success rate difference existed between district by age category for each year or across all years. Pinpointing the differences by gender and by ethnicity using cross tab chi-square analysis for each institution and for individual and combined academic periods concluded the data examination.

As a result of these descriptive statistical methodologies the initially raw data was transformed into meaningful information that could be used to draw conclusions and make WTCS level generalizations. Upon evaluation of the compiled information, the WTCS nontraditional course enrollee profile was created, satisfying the ultimate purpose of the research. The evaluation of the findings are found in Chapter IV – Analysis of Results while the final conclusions are located in Chapter V – Summary, Conclusions and Recommendations.

Limitations

The limitations of the study related to the sources, scope and methodologies applied in this analysis. Generally speaking, the data utilized was restricted to the publicly available WTCS System Attic data reports, the study omitting data and studies unavailable via this public online venue. The data analysis and results of this study regarded only the Wisconsin Technical College System's nontraditional delivery courses and the findings may not be applied to courses

of other state or national technical or community colleges. Additionally, web-based course satisfaction and success rates depend on the capabilities of the course management system, the resulting findings being unsuitable for extrapolation to other online delivery systems and districts have slightly divergent learning outcome expectations which, although affect success rate statistics, were ignored for the purposes of this study.

Specific methodology related limitations were the possibility of lost or interrupted connectivity with the main WTCS System Attic data source resulting in partially outdated figures. A particular limitation related to the use of pivot table as instrumentation tool as inexperienced users may sort or filter data incorrectly utilizing erroneous data in result. Furthermore the course completion data has been filtered to show two specific completion codes only, namely code one for a passing grade and completion code two received for failing a course. As a result, for the purposes of this study, completion codes showing withdrawals, transfers, etc. were omitted. Finally, it is possible that, over time, certain reporting categories could be changed or removed entirely by WTCS officials, resulting in the inability of replicating the foundational sources of the present research.

Chapter IV - Analysis of Results

Introduction

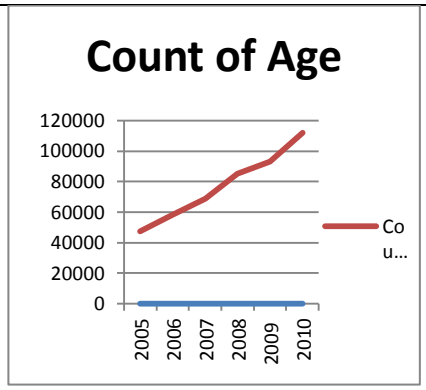
The purpose of this study was to create a demographic profile of the Wisconsin Technical College System (WTCS) nontraditional delivery course audience in order to support strategic prioritization in converting traditional courses to alternate formats. This goal was achieved via analysis of the demographic makeup of the nontraditional courses delivered at the four largest WTCS districts. Namely, this research examined the age, gender, ethnicity and minority status characteristics of Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College learners based on official enrollment and completion reporting data. The analysis performed lead to conclusions on learner characteristics affecting success rates in nontraditional technical college courses and to recommendations regarding the utility of the findings for prioritizing the transfer of traditional courses to web-based delivery.

The present Chapter IV – Analysis of Results represents the results of the analysis performed in this research. It compiles findings into blocks of meaningful information that revolve around the three research questions, providing a brief overview of goals and results. The investigation follows the guidelines set forth in Chapter III – Methodology and provides foundation for the conclusions and recommendations presented in Chapter V – Summary, Conclusions and Recommendations section of the study.

Research Question 1: What are the demographic characteristics of students enrolling in nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College?

The first question of the investigation regarded the demographic makeup of the WTCS nontraditional course enrollees. The analysis methodology first investigated the student population's characteristics from age group perspective, showing the total enrollee counts in each academic year and the average age of enrollees in Figure 1. The analysis showed that overall student numbers more than doubled in our sample during 2005 - 2010 and the average student age in these courses was 29 years with a standard deviation of approximately 9.83 years.

Demographic Trend	Count of Age
2005	47533
2006	58491
2007	68933
2008	85371
2009	92958
2010	111981

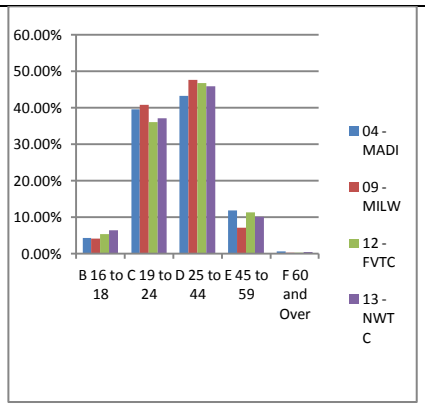


District Average Age		
District	Avg of Age	Count of Age
04 MADI	29.60	50231
09 MILW	28.22	105257
12 FVTC	29.85	49928
13NWTC	29.18	61035
Total	29.01	266451

Figure 1: Enrollment Trend - Age Count and Average Age Per District

The trend analysis of enrollees in our four technical college districts visualized in Figure 2 showed the evolution of the different age group categories over time in percentage rates, pointing out that the two most frequently represented age groups in WTCS nontraditional courses are 19 to 24 and 25 to 44 and showing that the same two age groups grew most significantly compared to the other age categories which were stagnant or even declining during the 2005-2010 timeframe.

Age Group	04 - MADI	09 - MILW	12 - FVTC	13 - NWTC
B 16 to 18	4.30 %	4.10 %	5.40 %	6.40 %
C 19 to 24	39.70 %	40.80%	36.10%	37.10%
D 25 to 44	43.30 %	47.70%	46.90%	46.00%
E 45 to 59	11.90 %	7.10 %	11.30%	10.10%
F 60 & Over	0.70 %	0.30 %	0.30 %	0.50 %



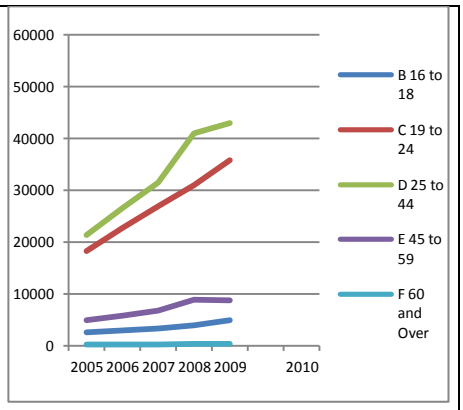


Figure 2: Enrollment Trend - Age Group Counts and Percentage Per District

Further analysis investigated the existence of differences across the districts within each academic year as well as across the entire 2005-2010 timeframe. The chi-square test utilized for each academic year regarding the district enrollee age groups showed statistically significant differences between the four districts as presented in Figure 3. The results of the chi-square test used to examine the differences between the four districts without regard to the academic year also demonstrated statistical significance.

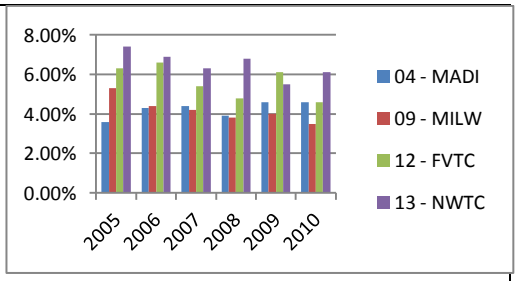
Age Group			
Fiscal Year	**chi-square stat**	**df**	**sig value**
2005	529.754	12	0
2006	603.823	12	0
2007	359.096	12	0
2008	649.971	12	0
2009	380.322	12	0
2010	487.197	12	0
Age Group	**chi-square stat**	**df**	**sig value**
across all years	2167.263	12	0

Figure 3: Chi - Square Test Findings - Age Groups

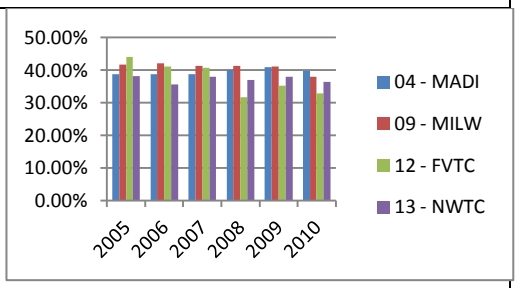
Consequently a detailed review was performed on each age group to find the sources of the differences. This examination represented in Figure 4 resulted that while some of the age categories were similar between the four districts, age groups 16 to 18 and above 60 there were significant different. The districts were comparable in certain age categories, namely for ages 18-

24, 25-44 and 45-59, allowing statewide generalizations, but lacked comparability in other age categories such as ages 16-18 and above 60, preventing across the board state level extrapolations. Overall, the analysis of enrollment age groups concluded that the typical student age in nontraditional WTCS courses was between 19 and 44 with the median age being 29 years, the 2005 – 2010 examination also proving that total enrollments in nontraditional courses have shown a steadily increasing trend over time.

16-18	2005	2006	2007	2008	2009	2010
04 - MADI	3.60%	4.30%	4.40%	3.90%	4.60%	4.60%
09 - MILW	5.30%	4.40%	4.20%	3.80%	4.00%	3.50%
12 - FVTC	6.30%	6.60%	5.40%	4.80%	6.10%	4.60%
13 - NWTC	7.40%	6.90%	6.30%	6.80%	5.50%	6.10%



19-24	2005	2006	2007	2008	2009	2010
04 - MADI	38.70%	38.70%	38.80%	40.10%	41.00%	39.80%
09 - MILW	41.80%	42.10%	41.40%	41.30%	41.20%	38.00%
12 - FVTC	44.10%	41.20%	40.80%	31.70%	35.30%	32.80%
13 - NWTC	38.20%	35.60%	37.90%	37.00%	37.90%	36.50%



25-44	2005	2006	2007	2008	2009	2010
04 - MADI	40.90%	40.90%	43.90%	44.10%	43.20%	44.60%
09 - MILW	46.00%	46.70%	47.50%	47.80%	47.30%	50.00%
12 - FVTC	41.00%	43.00%	42.80%	50.80%	46.70%	49.70%
13 - NWTC	44.90%	47.30%	45.90%	46.20%	46.10%	45.60%

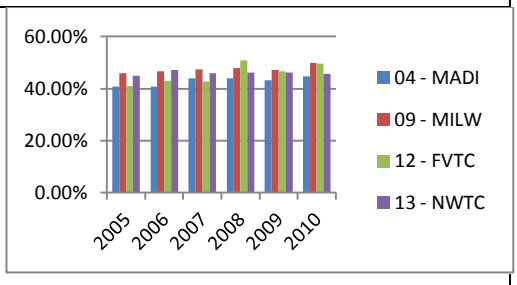
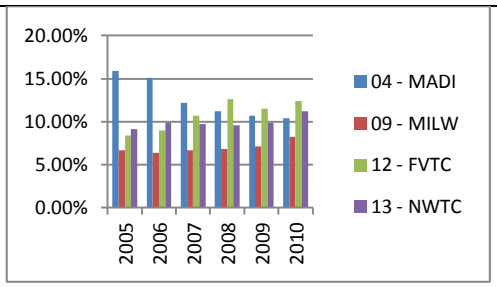


Figure 4: Enrollment Trends - Age Group Percentages Per District

45-59	2005	2006	2007	2008	2009	2010
04 - MADI	15.90%	15.10%	12.20%	11.20%	10.70%	10.40%
09 - MILW	6.70%	6.40%	6.70%	6.80%	7.10%	8.20%
12 - FVTC	8.40%	9.00%	10.70%	12.60%	11.50%	12.40%
13 - NWTC	9.10%	9.90%	9.70%	9.60%	9.90%	11.20%



60->	2005	2006	2007	2008	2009	2010
04 - MADI	1.00%	1.10%	0.70%	0.70%	0.50%	0.70%
09 - MILW	0.30%	0.30%	0.20%	0.30%	0.40%	0.40%
12 - FVTC	0.20%	0.20%	0.30%	0.20%	0.30%	0.50%
13 - NWTC	0.40%	0.20%	0.20%	0.40%	0.70%	0.70%

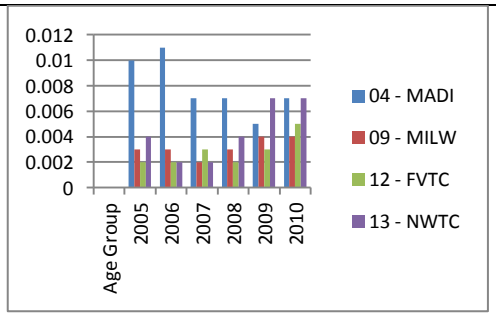


Figure 4: Enrollment Trends - Age Group Percentages Per District (Continued)

The second demographic category the study examined regarded the gender of enrollees. Female student percentage rates varied between 62% and 75% while male student percentage rates ranged between 24% and 37% as shown in Figure 5. In aggregate numbers, females represented approximately 71.6% of enrollees and males were at 28.3% as presented in Figure 6.

Count of Gender Aggregates Per District			
District	Gender	Total Count	Percentage
04 - MADI	Female	36045	71.8%
	Male	14160	28.2%
	Unknown	26	0.1%
04 - MADI Total		50231	
09 - MILW	Female	72506	68.9%
	Male	32710	31.1%
	Unknown	41	0.0%
09 - MILW Total		105257	
12 - FVTC	Female	31156	62.4%
	Male	18595	37.2%
	Unknown	177	0.4%
12 - FVTC Total		49928	
13 - NWTC	Female	46033	75.4%
	Male	14975	24.5%
	Unknown	27	0.0%
13 - NWTC Total		61035	
Grand Total		266451	

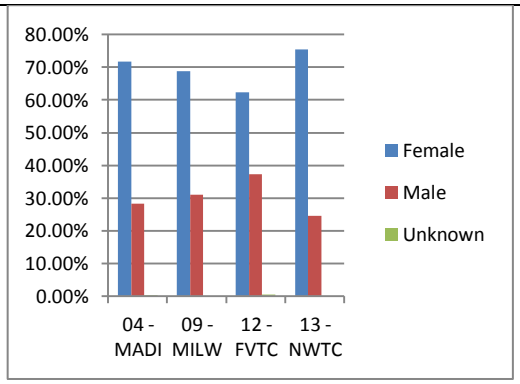


Figure 5: Enrollment Aggregates – Gender Counts and Percentages Per District

Demographic Data Overall: Counts and % of All Enrolled Students Aged 18 and Older **Count of Gender**		
Gender	Total	Percentages
Female	332929	71.6%
Male	131664	28.3%
Unknown	674	0.1%
Grand Total	465267	100.0%

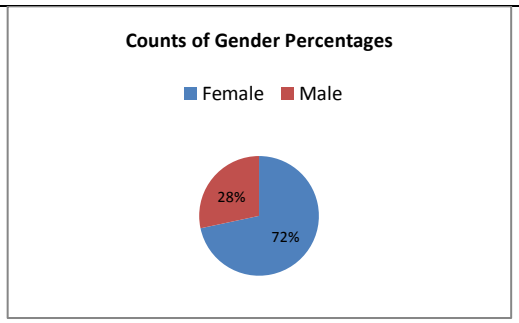
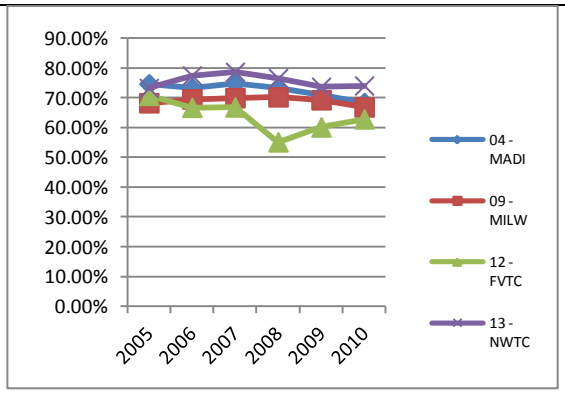


Figure 6: Overall Enrollment Aggregates – Gender Counts and Percentages

The gender trend analysis of the 2005-2010 enrollments represented by Figure 7 concluded that female and male populations were fairly stagnant across three of the districts while both populations showed an abrupt change at Fox Valley Technical College with a large increase in males and a significant decrease in females during the 2008 academic year.

Female Populations Trend Per District

	2005	2006	2007	2008	2009	2010	Grand Total
04 - MADI	74.60%	73.20%	74.70%	73.30%	70.80%	68.30%	71.80%
09 - MILW	68.20%	69.50%	69.90%	70.20%	69.20%	66.80%	68.90%
12 - FVTC	70.70%	66.70%	66.80%	55.10%	60.10%	62.80%	62.40%
13 - NWTC	73.20%	77.40%	78.60%	76.50%	73.60%	74.00%	75.40%



Male Populations Trend Per District

	2005	2006	2007	2008	2009	2010	Grand Total
04 - MADI	25.10%	26.60%	25.30%	26.70%	29.20%	31.70%	28.20%
09 - MILW	31.80%	30.50%	30.10%	29.80%	30.80%	33.10%	31.10%
12 - FVTC	28.80%	32.30%	32.70%	44.30%	39.80%	37.20%	37.20%
13 - NWTC	26.70%	22.60%	21.40%	23.50%	26.40%	25.80%	24.50%

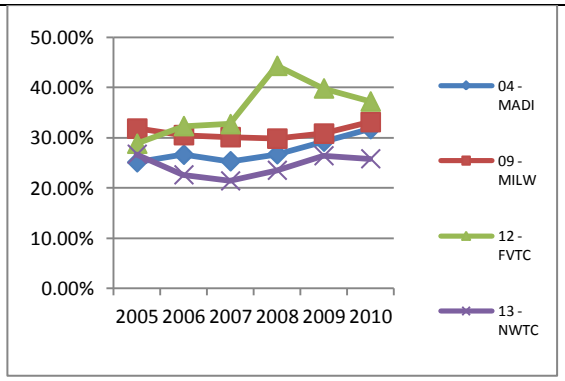


Figure 7: Enrollment Trend – Gender Percentages Per District

Finally, the investigation turned to analyze how the districts compared amongst each other for each of the academic years as well as across the entire timeframe given. The output

returned that the variances between districts were significantly different for each academic year as well as across the whole 2005-2010 period as presented in Figure 8. Thus, the study concluded that the overwhelming majority of WTCS non-traditional course enrollees were female and that, with the exception of Fox Valley Technical College, this trend was stagnant across the sample.

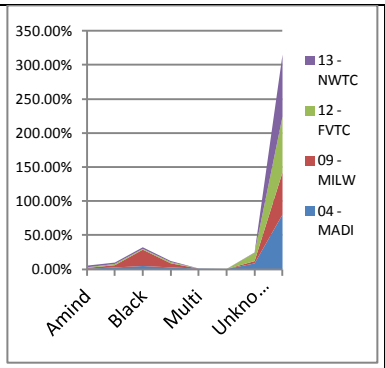
Gender (male/female comparisons only -- did not include "unknown")			
fiscal year	chi-square stat	df	sig value
2005	101.494	3	0
2006	220.092	3	0
2007	336.972	3	0
2008	1181.073	3	0
2009	524.485	3	0
2010	436.433	3	0
Gender (male/female comparisons only -- did not include "unknown")			
fiscal year	chi-square stat	df	sig value
across all years	2273.955	3	0

Figure 8: Chi - Square Test Findings - Gender

The third aspect of the enrollment demographics related to the ethnicity and minority status of the students. Here we found that approximately 80% of the nontraditional course participants were White, while African Americans percentage rates ranged between 1.2% and 24% and Hispanics were between 1.6% and 6%. Further analysis showed that Milwaukee Technical College had the highest African American student population with 24% while all districts had a significant White audience as represented in Figure 9 below.

Ethnic Category Per District

	04 - MADI	09 - MILW	12 - FVTC	13 - NWTC
Amind	0.70%	1.10%	0.90%	2.50%
Asian	2.50%	3.30%	1.90%	2.00%
Black	4.60%	24.00%	1.20%	2.30%
Hisp	2.60%	6.00%	1.80%	1.60%
Multi	0.80%	0.00%	0.00%	0.20%
Pacific	0.20%	0.00%	0.10%	0.10%
Unknow	8.40%	3.40%	12.10%	0.60%
White	80.10%	62.10%	81.90%	90.80%



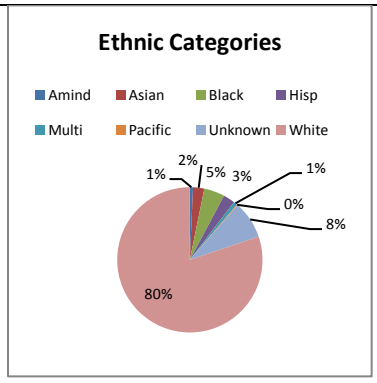


Figure 9: Enrollment Demographics - Overall and District Ethnicity Percentages

Overall, minority status coded with code zero (0) for nonminority White student populations and code one (1) for minority students of all ethnicities varied greatly amongst

districts. Minorities were best represented in the Milwaukee district with approximately 34% of total enrollments, but NWTC and Fox Valley lagged at 6%. For each district, these trends were steady across the 2005-2010 timeframe with a slight increase in minority percentage rates as shown in Figure 10.

Demographic Data Overall: Counts and % of All Enrolled Students Aged 18 and Older **-Count of Minority-**							
	Fiscal Year: Counts						
Minority Status	2005	2006	2007	2008	2009	2010	Grand Total
0	41036	50237	59610	74013	80278	95717	400891
1	6497	8254	9323	11358	12680	16264	64376
Total	47533	58491	68933	85371	92958	111981	465267
	Fiscal Year: Percentages						
Minority Status	2005	2006	2007	2008	2009	2010	Grand Total
0	86.3%	85.9%	86.5%	86.7%	86.4%	85.5%	86.2%
1	13.7%	14.1%	13.5%	13.3%	13.6%	14.5%	13.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

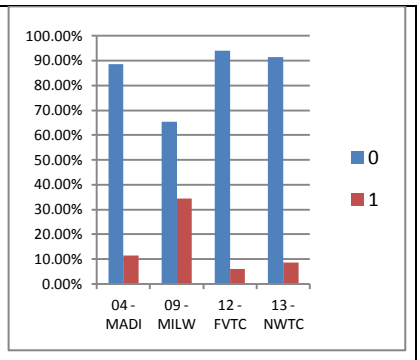


Figure 10: Enrollment Demographics - Overall and District Minority Status Counts

The chi-square test utilized to compare the districts returned statistically significant difference in this category as well. As shown in Figure11 these were due to the large differences in overall minority enrollments between districts ranging from a low of 5% to a high of 35%.

Ethnicity			
fiscal year	**chi-square stat**	**df**	**sig value**
2005	3831.798	18	0
2006	5067.692	18	0
2007	6246.479	18	0
2008	8587.847	18	0
2009	10540.818	21	0
2010	11393.843	21	0
Ethnicity			
fiscal year	chi-square stat	df	sig value
across all years	44982.031	21	0

Figure 11: Chi - Square Test Findings - Ethnicity

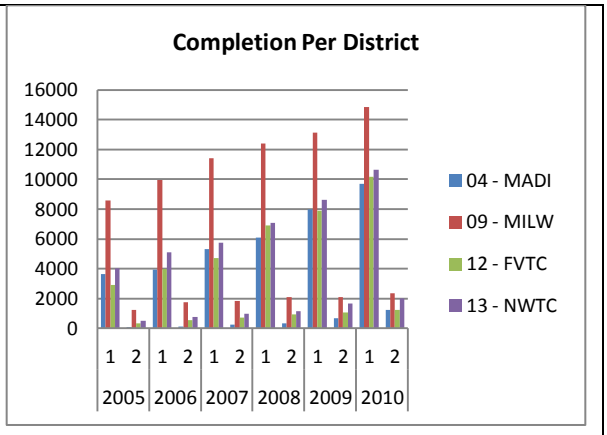
In the end the study reached the conclusion that across the sample approximately 80% of nontraditional course enrollees were White and that there were significant differences in the overall minority percentage rates between the four districts.

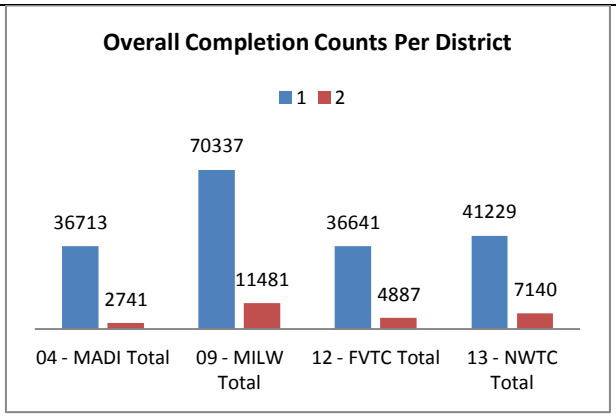
Research Question 2: What are the demographic characteristics of students completing nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College?

The second goal of this study was to determine the demographic makeup of the WTCS nontraditional course completers. Similarly to the first research question, the data analysis performed on the sampled four technical college districts resulted is summary tables and graphs representing the counts and percentage rates of students completing these courses with completion code one or two. Completion code one stands for successful completion or passing with grades A through D while completion code two represents failure graded with F. Course withdrawals, transfers, in progress and other alternative completion codes were ignored by this analysis. The examination regarded distinctively the four individual technical college districts as well as their aggregate values representing the research sample.

The aggregate value table showed that over time the count of successful students was steadily increasing but overall success rates per district varied between 85% and 93%, averaging at 87.6% for the sample. Per district, Madison's overall pass rate was 93%, the highest value for the sample, while Milwaukee's was 86%, Fox Valley's 88% and NWTC ranked lowest at 85% as shown in Figure 12.

Success Rates by District Counts of Pass/Fail Students **Count of Completion Code**				
	Completion Code			Overall Pass Rate Per District
District	1	2	Grand Total	
04 - MADI	36713	2741	39454	93.10%
09 - MILW	70337	11481	81818	86.00%
12 - FVTC	36641	4887	41528	88.20%
13 - NWTC	41229	7140	48369	85.20%
Grand Total	184920	26249	211169	87.60%





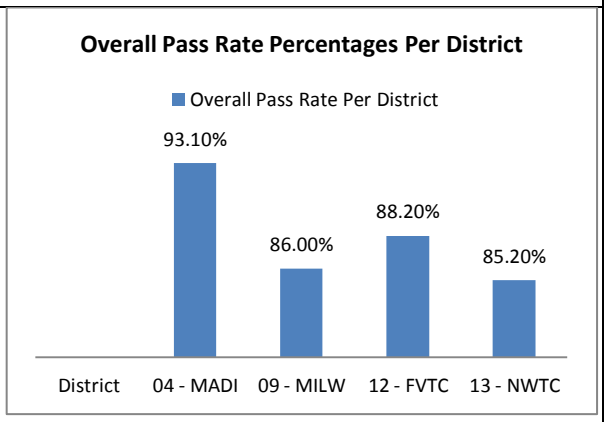


Figure 12: Overall & District Completion Rates Counts and Percentages

To see the evolution over time a trend analysis was performed across the six academic years ranging between 2005 and 2010, resulting in the conclusion that although in absolute numbers students completion in nontraditional courses had increased over the years, the overall percentage rate of success across the years was stagnant, staying around an average of 87% shown in Figure 13.

Success Rates Overall: Counts of Pass/Fail Students **Count of Completion Code**							
Completion Code	2005	2006	2007	2008	2009	2010	Grand Total
1	31964	39998	48109	61545	67145	81079	329840
2	4537	6140	7232	8658	10010	12859	49436
Grand Total	36501	46138	55341	70203	77155	93938	379276

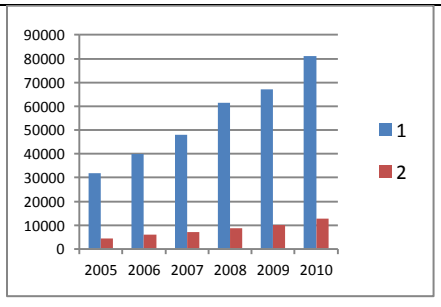


Figure 13: Overall Completion Rate Trend Counts

Next, the analysis investigated the demographic composition of the values shown above. Using chi-square testing, it looked to see if the counts of pass and fail differed by age group, gender or ethnicity as presented in Figure 14, 16 and 17.

Success Rates by District Counts of Pass/Fail Students **Count of Completion Code**					
		Completion Code			% within each age group who passed
District	Age Group	1	2	Grand Total	Percentage
04 - MADI	B 16 to 18	1258	232	1490	84.4%
	C 19 to 24	13603	1322	14925	91.1%
	D 25 to 44	16707	998	17705	94.4%
	E 45 to 59	4918	176	5094	96.5%
	F 60 and Over	227	13	240	94.6%
04 - MADI Total		36713	2741	39454	
09 - MILW	B 16 to 18	2324	810	3134	74.2%
	C 19 to 24	26749	5461	32210	83.0%
	D 25 to 44	35423	4700	40123	88.3%
	E 45 to 59	5613	480	6093	92.1%
	F 60 and Over	228	30	258	88.4%
09 - MILW Total		70337	11481	81818	
12 - FVTC	B 16 to 18	1643	422	2065	79.6%
	C 19 to 24	11744	2305	14049	83.6%
	D 25 to 44	18368	1862	20230	90.8%
	E 45 to 59	4748	291	5039	94.2%
	F 60 and Over	138	7	145	95.2%
12 - FVTC Total		36641	4887	41528	
13 - NWTC	B 16 to 18	2100	791	2891	72.6%
	C 19 to 24	13691	3367	17058	80.3%
	D 25 to 44	20253	2608	22861	88.6%
	E 45 to 59	4981	345	5326	93.5%
	F 60 and Over	204	29	233	87.6%
13 - NWTC Total		41229	7140	48369	
Grand Total		184920	26249	211169	

Figure 14: District Completion Rates Per Age Group Counts & Percentages

For students completing with code one for pass or code two for fail across districts the findings presented in Figure 15 showed that in nontraditional courses delivered within the WTCS the 45 to 59 years old age group was the most successful with an aggregate pass rate of 94% while the 16 to18year old students had the lowest or 76% success rate.

Success Rates Overall: Counts of Pass/Fail Students **Count of Completion Code**				
	Completion Code			% within each age group that passed
Age Group	1	2	Grand Total	
B 16 to 18	13238	4099	17337	76.4%
C 19 to 24	113891	23685	137576	82.8%
D 25 to 44	162759	19057	181816	89.5%
E 45 to 59	38552	2454	41006	94.0%
F 60 and Over	1400	141	1541	90.9%
Grand Total	329840	49436	379276	87.0%

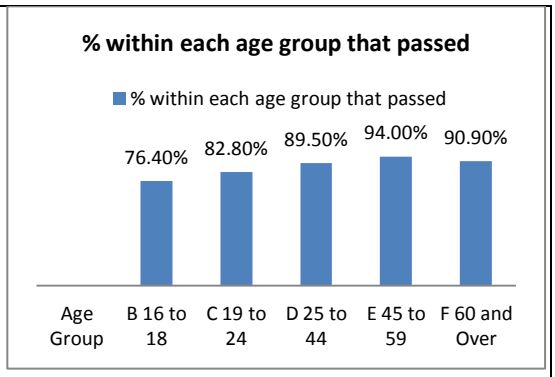


Figure 15: Overall Completion Rates Per Age Group Counts & Percentages

As far as gender, the districts mirrored significant differences between each other as presented in Figure 16 below. In this respect, the successful completion percentage were as low as 82% in some case of NWTC's male population or as high as 91% for Madison's male students. Female students were on average more successful, ranging from NWTC's 86% all the way to Madison's 93% presented in the following Figure 17.

Success Rates by District Counts of Pass/Fail Students **Count of Completion Code**					
		Completion Code			% within each gender who passed
District	Gender	1	2	Grand Total	Percentage
04 - MADI	Female	27201	1878	29079	93.5%
	Male	9501	860	10361	91.7%
	Unknown	11	3	14	78.6%
04 - MADI Total		36713	2741	39454	
09 - MILW	Female	49445	7563	57008	86.7%
	Male	20857	3917	24774	84.2%
	Unknown	35	1	36	97.2%
09 - MILW Total		70337	11481	81818	
12 - FVTC	Female	23448	2822	26270	89.3%
	Male	13080	2022	15102	86.6%
	Unknown	113	43	156	72.4%
12 - FVTC Total		36641	4887	41528	
13 - NWTC	Female	32072	5209	37281	86.0%
	Male	9136	1930	11066	82.6%
	Unknown	21	1	22	95.5%
13 - NWTC Total		41229	7140	48369	
Grand Total		184920	26249	211169	

Figure 16: District Completion Rates Per Age Gender Counts & Percentages

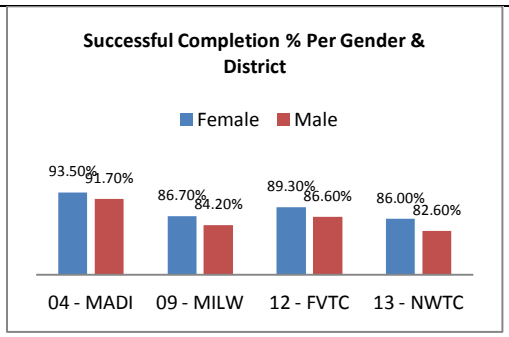


Figure 17: District Success Rates Per Gender Percentages

For ethnicity, the overall pass rates across the sample averaged at approximately 87% with the successful minority student population percentage rate being 79% and the non-minority students passing 88% of the time. The trend analysis pointed out that the success rate of non-minority was steadily increasing while the minority students' pass rate was stagnant as shown in Figure 18 and Figure 19.

Success Rates by District Counts of Pass/Fail Students - Count of Completion Code

District	Ethnic	Completion Code 1	2	Grand Total	% within each ethnicity group who passed
04 - MADI	Amind	188	26	214	87.9%
	Asian	999	48	1047	95.4%
	Black	1320	208	1528	86.4%
	Hisp	948	76	1024	92.6%
	Multi	267	34	301	88.7%
	Pacific	68	2	70	97.1%
	Unknown	3000	243	3243	92.5%
	White	29923	2104	32027	93.4%
04 - MADI Total		36713	2741	39454	
09 - MILW	Amind	788	157	945	83.4%
	Asian	2280	379	2659	85.7%
	Black	13762	4080	17842	77.1%
	Hisp	4073	787	4860	83.8%
	Pacific	36	5	41	87.8%
	Unknown	2367	379	2746	86.2%
	White	47031	5694	52725	89.2%
09 - MILW Total		70337	11481	81818	
12 - FVTC	Amind	273	58	331	82.5%
	Asian	687	108	795	86.4%
	Black	356	88	444	80.2%
	Hisp	596	119	715	83.4%
	Multi	14	1	15	93.3%
	Pacific	25	9	34	73.5%
	Unknown	4489	787	5276	85.1%
	White	30201	3717	33918	89.0%
12 - FVTC Total		36641	4887	41528	
13 - NWTC	Amind	838	288	1126	74.4%
	Asian	768	151	919	83.6%
	Black	690	287	977	70.6%
	Hisp	508	169	677	75.0%
	Multi	59	36	95	62.1%
	Pacific	28	1	29	96.6%
	Unknown	263	36	299	88.0%
	White	38075	6172	44247	86.1%
13 - NWTC Total		41229	7140	48369	
Grand Total		184920	26249	211169	

Figure 18: District Completion Rates Per Ethnicity Counts & Percentages

Success Rates Overall: Counts of Pass/Fail Students **Count of Completion Code**				
	Completion Code			% within each minority code that passed
Minority	1	2	Grand Total	
0	291712	39775	331487	88.0%
1	38128	9661	47789	79.8%
Grand Total	329840	49436	379276	87.0%

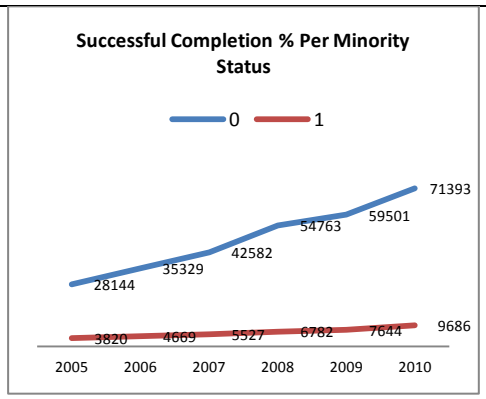


Figure 19: District Success Rates Per Minority Status Counts & Percentages

For the ethnic categories tracked by the WTCS reporting data representing the basis of this investigation, pass rates coded with code one were 77% for American Indians, 87% for Asian Americans, 76% for African Americans, 82% for Hispanics, 82% for Multiethnic students, 86% for Pacific Islanders and 88% for Whites respectively, shown by Figure 20.

Success Rates Overall: Counts of Pass/Fail Students **Count of Completion Code**				
	Completion Code			% within each ethnic group that passed
Ethnic	1	2	Grand Total	
Amind	3341	953	4294	77.8%
Asian	6754	985	7739	87.3%
Black	18475	5727	24202	76.3%
Hisp	8548	1798	10346	82.6%
Multi	709	150	859	82.5%
Pacific	301	48	349	86.2%
Unknown	12753	1959	14712	86.7%
White	278959	37816	316775	88.1%
Grand Total	329840	49436	379276	87.0%

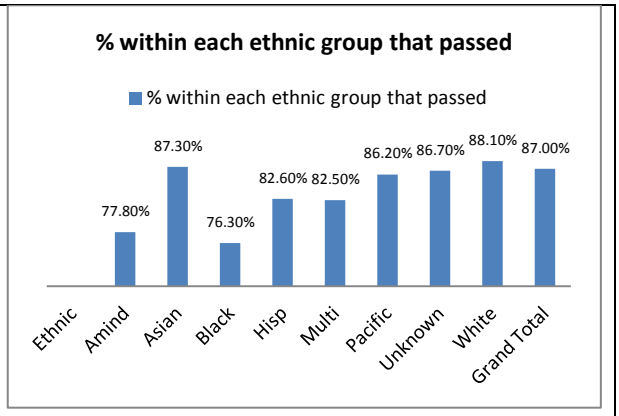


Figure 20: Overall Success Rates Per Ethnicity Counts & Percentages

The lowest success rates between all ethnic categories were found in NWTC's Multiethnic category at 62%, while the same category scored as high as 93% at Fox Valley Technical College, pointing to a significant variance between districts. Overall, the most successful student group was Madison's Pacific Islander ethnic group with 97% pass rate as presented in Figure 21.

	04 - MADI	09 - MILW	12 - FVTC	13 - NWTC
Amind	87.90%	83.40%	82.50%	74.40%
Asian	95.40%	85.70%	86.40%	83.60%
Black	86.40%	77.10%	80.20%	70.60%
Hisp	92.60%	83.80%	83.40%	75.00%
Multi	88.70%	85.67%	93.30%	62.10%
Pacific	97.10%	87.80%	73.50%	96.60%
Unknown	92.50%	86.20%	85.10%	88.00%
White	93.40%	89.20%	89.00%	86.10%

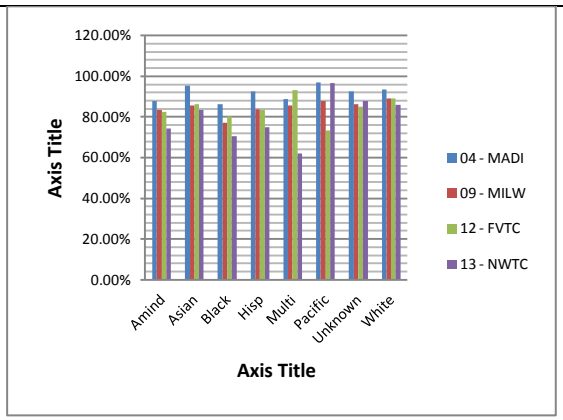


Figure 21: District Success Rates Per Ethnicity Percentages

The chi-square testing for each district as well as for the entire sample for age groups, gender and ethnicity over the six academic years analyzed are shown in Figure 22. Consequently to the statistically significant differences put forth by this test, the research proceeded to evaluate the results of each piece of investigation to bring forth reliable sample level generalizations related to the demographic variables investigated.

Madison			
across all years	chi-square stat	df	sig value
Age group	399.641	4	0
gender (male/female)	40.125	1	0
ethnicity	142.545	7	0
Milwaukee			
across all years	chi-square stat	df	sig value
Age group	961.846	4	0
gender (male/female)	92.649	1	0
ethnicity	1635.696	6	0
Fox Valley			
across all years	chi-square stat	df	sig value
Age group	749.692	4	0
gender (male/female)	64.978	1	0
ethnicity	136.396	7	0
NWTC			
across all years	chi-square stat	df	sig value
Age group	1196.326	4	0
gender (male/female)	81.569	1	0
ethnicity	396.882	7	0
All 4 Districts			
across all years	chi-square stat	df	sig value
Age group	1196.326	4	0
gender (male/female)	765.02	1	0
ethnicity	3254.889	7	0

Figure 22: Chi - Square Test Findings – Overall Results

In conclusion, although direct generalizations were impossible due to statistically significant differences found, the analysis of success and failure in nontraditional WTCS courses points out that between the four technical colleges investigated, Madison students were the most successful, passing at a 93% rate while NWTC ranked lowest with a 85% pass rate. Within these results the most successful age group was the 45 to 59 year old population with a 94% pass rate while the 16 to 18 years old students struggled at 76%. The analysis also clarified that females were on average more successful, passing at a 86-93% rate while males completed the nontraditional delivery courses approximately 82-91% of the time with variations amongst the districts.

Finally, the investigation pointed out that within the average 87% pass rate slight variations existed based on ethnic categories, the least successful learner group being NWTC's Multiethnic group while the most successful students being Madison's Pacific Islanders. The numbers of successful students grew over time in absolute numbers mainly due to continually increasing enrollments during the analyzed 2005-2010 period while the success percentage rates increases experienced were primarily due to enhanced non-minority student success rates.

Chapter V – Summary, Conclusions and Recommendations

Introduction

At the present time, WTCS faces the problem of not quantifying the impact of learner demographics such as age, gender, ethnicity and minority status on the overall enrollment and success rates in nontraditional courses represented by online, blended, videoconference and self-paced telecourse delivery modes. Without a clear understanding of the correlation existent between student characteristics and nontraditional course success, administrators are forced to transfer programs of study to virtual delivery randomly, without strategic focus or prioritization. This approach, however, results in inefficient use of resources as well as risk of decreased enrollments in courses that by their inherent flexibility and convenience could satisfy career and technical education's ultimate purpose of "extending learning beyond the classroom and throughout life" (WTCS, 2011).

This study aimed to solve this problem by reaching conclusions on the characteristics of nontraditional course enrollees and graduates. The analysis looked at the publicly available WTCS district level student demographic data for the 2005-2010 academic years evaluating the trends in enrollments and success rates in order to provide WTCS administrators relevant information for determining the course transfer priorities to virtual delivery.

Chapter V – Summary, Conclusions and Recommendations provides a descriptive summary of the research findings. The conclusions contain an overview of the general demographic characteristics of nontraditional WTCS courses students and their possible uses for strategizing development, marketing and personnel effort in transferring courses to web-based

delivery. The chapter concludes with recommendations for further research regarding the demographic analysis of nontraditional WTCS course students.

Summary

The purpose of this study was to create a demographic profile of a Wisconsin Technical College System (WTCS) nontraditional course student, helping administrators make effective strategic decisions about priorities for converting courses to web-based delivery. More specifically, the research provided data-based evidence needed for understanding the demographic makeup of WTCS online, blended, videoconference and self-paced telecourse program audiences as well as the relationship between enrollment and success rates for these student populations. The analysis performed lead to conclusions on learner characteristics ending with recommendations regarding use of the collected data in determining WTCS program transfer priorities to the virtual environment with improved student success in mind.

This research was based on WTCS reporting data available online. The study's data source was the official WTCS System Attic reporting database filtered by a pivot table as to return only nontraditional course related information for the four largest WTCS technical college districts. The nontraditional course category involved the online, blended, videoconference, and self-paced telecourse distance delivery modes and excluded only the traditional face-to-face classroom courses. The research samples was formed by the Madison, Milwaukee, Fox Valley and NWTC technical colleges representative of the system wide population based on having the highest full-time equivalent enrollment numbers within the WTCS. The analysis separated the age, gender, ethnicity and minority status related enrollment and course completion information for these four districts and drew conclusions on generalities that were reliably representative of

the entire sample and WTCS population. The questions addressed related to understanding the demographic makeup of the nontraditional WTCS course audience. Upon completion of the steps involved in answering the two research questions listed below conclusions were drawn regarding the overall demographic profile of the WTCS nontraditional course students and the benefits of using this data for prioritizing the transfer of traditional courses to the virtual environment.

Research Question 1: What are the demographic characteristics of students enrolling in nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical Colleges?

Steps for answering this first research question related to the selection of the research sample comprised of the four largest WTCS technical colleges based on full-time enrollments, namely Madison, Milwaukee, Fox Valley and NWTC, of a compilation of their demographic data based on WTCS system reports and a comparison analysis between districts. Enrollment data from the four sampled districts was analyzed to determine percentage rates per age group, gender, ethnic category and minority status for each of the four districts as well as an aggregate for the entire sample. A district level trend analysis was performed to visualize evolution of enrollments rates, the results being complied into a single database for comparison and contrast investigation. To determine the differences across the sample, a crosstab chi-square analysis was performed for each academic year including age category, gender, ethnicity and minority status by district.

Research Question 2: What are the demographic characteristics of students completing nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical Colleges?

This section concerned the analysis of sample level success rates using cross tab chi-square testing for each of the four districts. The investigation looked to determine whether success rate differences existed between districts by age category for each academic year or across all years. A cross tab chi-square analysis for the differences by age group, gender and by ethnicity for each institution and for individual and combined academic periods concluded the graduating student data examination.

Conclusions

In order to develop the profile of the WTCS nontraditional delivery course student population the present research combined the sectional analysis pieces performed for the enrollment and completion aspects. By drawing conclusions on the demographic characteristics based profile of the student populations enrolling and graduating from these courses technical college administrators are able to personalize development and marketing and redirect personnel to best serve the needs of their audience.

Research Question 1: What are the demographic characteristics of students enrolling in nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical Colleges?

The first question of the investigation regarded the demographic makeup of the WTCS nontraditional course enrollees. The data analysis methodology applied to the official WTCS enrollment reports resulted in tables and graphs describing the counts and percentage rates of

student age groups, gender and ethnicities per district as well as the characteristics of the sample based on aggregates. The data analysis pointed out that the two age group categories most frequently represented in the WTCS nontraditional courses were the 19 to 24 and the 25 to 44 age groups and that the average age in these courses was 29 years with a standard deviation of approximately 9.83 years. The evolution of the different age group categories over time showed that student groups aged 19 to 24 and 25 to 44 grew most significantly while other age categories were stagnant or even declining during 2005-2010.

Further analysis looked into the existence of differences across the districts within each academic year as well as across the entire 2005-2010 timeframe. The chi-square test utilized for each academic year regarding the age groups enrolled in nontraditional courses offered by the Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical College districts showed statistically significant differences between the four districts. Similarly, the chi-square test used to examine the differences between the four districts without regard to the academic year also returned statistical significant results. Consequently a detailed review was performed on each age group from the perspective of district enrollments to find the sources of these statistically significant differences. This examination showed that while the two major age categories, namely age 19 to 24 and age 25 to 44 were similar between the four districts, there were significant differences in enrollments for age groups 16 to 18 and age 60 and above, leading to the conclusion that the districts are comparable in certain age categories but lack comparability in others thus preventing overall generalizations to state level. Overall, the analysis concluded that the typical student age in nontraditional WTCS courses was between 19 and 44 with the median age being 29 years old.

The second demographic category examined was the gender of enrollees. The results showed that approximately 72% of nontraditional WTCS course enrollees were female and 28% were male in each of the four districts analyzed. The gender trend analysis for the 2005-2010 enrollments resulted in the conclusion that female and male populations were fairly stagnant across three of the four districts while the Fox Valley male population increased abruptly and was correlated with a significant decrease in females during the 2008 academic year. In conclusion, the study found that the overwhelming majority of WTCS nontraditional course enrollees are female and that, with the exception of Fox Valley Technical College, this trend was stagnant across the sample population.

The third aspect of the enrollment demographics related to the ethnicity and minority status of the students. Here the investigation showed that approximately 80% of the nontraditional course participants were White, while African American percentage rates ranged between 1.2% and 24% and Hispanics were between 1.6% and 6%. Further analysis showed that Milwaukee Technical College had the highest or 24% African American student population while all districts had significant White and Multiethnic audiences.

Overall, minority status varied greatly amongst districts. Minorities were best represented in the Milwaukee district with approximately 34% of total enrollments and Northeast Wisconsin Technical College and Fox Valley lagged at 6%. For each district, these trends were steady across the 2005-2010 timeframe with a slight increase in minority percentage rates. The chi-square test utilized to compare the districts returned statistically significant difference in this category due to the large differences in overall minority enrollments between the four technical colleges ranging from a low of 5% to a high of 35%. In conclusion, approximately 80% of

nontraditional course enrollees were White and there were significant differences in the overall minority percentage rates between the four districts.

Research Question 2: What are the demographic characteristics of students completing nontraditional Wisconsin Technical College System courses offered at Madison, Milwaukee, Fox Valley and Northeast Wisconsin Technical Colleges?

The second goal of this study was to determine the demographic makeup of the WTCS nontraditional course completers. Similarly to the first research question, the data analysis performed on the sampled four technical college districts resulted in summary tables and graphs representing the counts and percentage rates of students completing these courses with completion code one or two. Code one stands for successful completion or passing with grades A through D while code two exemplifies failure graded with F. Course withdrawals, transfers, in progress and other alternative completion codes were ignored by this analysis. The examination regarded the four individual technical college districts distinctively as well as their aggregate values representing the research sample.

The aggregate value table showed that over time the count of successful students was steadily increasing also clarifying that overall district success rates varied between 85% and 93% and averaged at 87.6% for the sample. Per district, Madison's overall pass rate was the highest with 93% within the sample, while Milwaukee's was 86%, Fox Valley stood at 88% while NWTC ranked lowest at 85%. To see the evolution over time, a trend analysis was performed across the six academic years ranging between 2005 and 2010, resulting in the conclusion that although in absolute numbers student completion in nontraditional courses increased over the

years the overall percentage rate of success across the years was stagnant, staying around an average of 87%.

Next, the analysis investigated the demographic composition of the values shown above using chi-square testing. It looked to see if the counts of pass and fail differed by age group, gender and ethnicity. Consequently to the statistically significant differences resulting from this testing the analysis proceeded to look at each of the demographic variables in detail to investigate the sources of the differences found.

For students completing with code one for pass or code two for fail across districts the findings showed that in nontraditional courses delivered within the WTCS the 45 to 59 years old age group was the most successful with an aggregate pass rate of 94% while the 16 to18year old students had the lowest, or 76% success rates.

As far as gender, the districts showed significant differences between each other. In this respect, the successful completion percentage rate was as low as 82% in case of NWTC's male population and as high as 91% for Madison's male students. Female students were on average, more successful, ranging from NWTC's 86% all the way to Madison's 93%.

For ethnicity, the overall pass rates across the sample averaged out at approximately 87% with the successful minority student population percentage rate being 79% and the non-minority students passing 88% of the time. The analysis also showcased the fact that the non-minority student success rate was steadily increasing while the minority students' pass rate was stagnant.

For the ethnic categories tracked by the WTCS reporting data pass rates were 77% for American Indians, 87% for Asian Americans, 76% for African Americans, 82% for Hispanics, 82% for Multiethnic students, 86% for Pacific Islanders and 88% for Whites respectively. The

lowest success rates between all ethnic categories were found in NWTC's Multiethnic category at 62%, while the same category scored as high as 93% at Fox Valley Technical College pointing out a significant variance between districts. Overall, the most successful were Madison's Pacific Islander students with a 97% pass rate. The investigation found a significantly lower gap between success rates by ethnicity than in case of enrollments the analysis supporting the conclusion that, amongst the students enrolling, approximately the same percentage rates passed in each ethnic category. On average, approximately 88% of non-minority students passed while the success rate for minorities was at 79%, this spread of approximately 9 percentage points comparing to the 55 point spread between the two distinct enrollment categories. On the other hand non-minority success rates increased over time while minority pass rates were stagnant for the 2005-2010 period.

In conclusion, the analysis of success and failure in non-traditional WTCs courses pointed out that between the four technical colleges investigated, Madison students were the most successful, passing at a 93% while NWTC ranked the lowest at 85%. We can see that within these results the most successful age group was the 45 to 59 year old population with a 94% pass rate while the 16 to 18 years old students struggled at a 76% pass rate. The analysis also clarified that females were on average slightly more successful passing at a 86-93% rate while males completed the nontraditional delivery courses approximately 82-91% of the time with variations amongst the districts.

Finally, the investigation showed that within the average 87% pass rate variations existed based on ethnic categories, the least successful group being NWTC's Multiethnic group while the most successful students are Madison's Pacific Islander audience. On average during the analyzed 2005-2010 period the success percentage rates increased mainly for non-minority

student populations while presenting a stagnant status for the aggregate minority group in each district.

Overall conclusions regarding the profile of nontraditional WTCS course students were drawn by analyzing the correlations existent between enrollment and completion data findings. The comparisons between reports for each demographic variable analyzed, namely age group, gender, ethnicity and minority status built step by step the profile of the representative enrollee and completer. This investigation resulted that the most typical nontraditional course enrollee was a 19 to 44 years old White female student while the most likely successful completer was a White female aged between 45 and 59 years. Most nontraditional course enrollees were aged 19 to 44 and they had, indifferently of gender or ethnicity, success rate ranging between 80%-91% depending on district, averaging around 85.5% for the entire sample.

Limitations

The limitations of the study related to the sources, scope and methodologies applied in this analysis. Generally speaking, the data utilized was restricted to the publicly available WTCS System Attic data reports, the study omitting data and studies unavailable via this public online venue. The data analysis and results of this study regarded only the Wisconsin Technical College System's nontraditional delivery courses and the findings may not be applied to courses of other state or national technical or community colleges. Additionally, web-based course satisfaction and success rates depend on the capabilities of the course management system, the resulting findings being unsuitable for extrapolation to other online delivery systems and districts have slightly divergent learning outcome expectations which, although affect success rate statistics, were ignored for the purposes of this study.

Specific methodology related limitations were the possibility of lost or interrupted connectivity with the main WTCS System Attic data source resulting in partially outdated figures. A particular limitation related to the use of pivot table as instrumentation tool as inexperienced users may sort or filter data incorrectly utilizing erroneous data in result. Furthermore the course completion data has been filtered to show two specific completion codes only, namely code one for a passing grade and completion code two received for failing a course. As a result, for the purposes of this study, completion codes showing withdrawals, transfers, etc. were omitted. Finally, it is possible that, over time, certain reporting categories could be changed or removed entirely by WTCS officials, resulting in the inability of replicating the foundational sources of the present research.

Recommendations

Given the results of this study as they relate to building the profile of the most representative WTCS nontraditional course enrollee and the most likely completer, it is essential to contemplate on the fact that the current audience of these courses is mainly made up of young non-minority females. Based on these results, the researcher recommends that administrators carefully review and analyze the program courses and topics offered via nontraditional delivery modes and evaluate the reasons for the 44% percentage point difference between male and female enrollments as well as the up to 72% discrepancy existent between non-minority and minority enrollment numbers.

Essentially, technical college administrators need to assure that their technical college curriculums serve equally males and females as well as minorities and non-minority students via the online, blended, videoconference and self-paced telecourse courses. It is recommended that

decision makers evaluate the number of courses offered via nontraditional delivery in all industry and career areas, assuring that courses and programs traditionally preferred by males versus females are made equally available via these distance learning options.

To assure maximum return on investment and well as to equally serve both non-minority and minority groups, it is suggested that technical college administrators evaluate the accessibility, support options and delivery language of these nontraditional courses to serve equally all their student audiences eliminating the possibility that the lower minority related enrollment and success percentage rates could be due in fact to lack of optimal English as Second Language Learner delivery or support options.

Finally, based on the present research findings as to the largest discrepancies between different student groups are found at the level of enrollments while the completion rates are as close as 4% for male/female rates and 9% for minority/non-minority percentages, a recommendation is made to technical college leadership as to increase focus in developing and marketing program courses traditionally preferred by male students and enhance course options appealing for minority student groups as once enrolled, the likelihood of these learner categories succeeding in nontraditional WTCS courses is comparable to that of White female students. Thus it is recommended that administrators invest time and effort in transitioning auto mechanics, electronics, computer science, printing technologies and other traditionally male student preferred programs as well as English as Second Language Learner focused courses to online, blended, videoconference and self-paced telecourse deliveries to best serve all their student audiences.

Recommendations for Further Research

This study did not address the individual components of the nontraditional course categories utilized for tracking within the WTCS. By the definition currently used by the WTCS system administrators separating such data was impossible at system level due to the individual technical colleges reporting to the state headquarters only the aggregate numbers for all nontraditional delivery courses. Namely, the nontraditional course data used in this research included online, blended, videoconference and self-paced telecourse delivery modes together without separation of each separate category. Analysis of each type of nontraditional delivery method would only be possible at each individual district with appropriate access to proprietary data warehousing and reporting systems. As knowledge surrounding how enrollment and completion demographics present in the different types of nontraditional delivery courses may be of particular value, further research is recommended for segregation and analysis of data at this yet deeper level.

This study also did not address the definition of the success in nontraditional WTCS courses. Although most WTCS course competencies are clearly set at state level, discrepancies exist as far as the grade points and scales used by each instructor and/or district. Thus a passing grade could represent a slightly different preparedness level in one course or delivery mode versus another. Given that the success rates analyzed in this study were based on passing scores, or grades A, B, C or D, an in-depth analysis of district or delivery mode based discrepancies in defining course success is a recommended way to gain further insight into reasons behind the statistically significant differences between districts found by the present research study.

Finally, this study did not analyze the correlation existent between the demographic characteristics of populations served by each district and the same variables in students enrolling in and graduating from each specific technical college. By reviewing the age, gender and ethnicity composition of the sample population, valuable insight could be gained regarding the representativeness of enrollments and completions for the local populations served by districts, providing WTCS administrators with yet deeper knowledge on who may, in the future, enroll and succeed in nontraditional course offered by the Wisconsin Technical College System.

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