

AN EXAMINATION OF THE SIGNIFICANCE AND INFLUENCE OF DISTANCE
BETWEEN HIGH SCHOOLS AND COMMUNITY COLLEGE CAMPUSES
ON DUAL ENROLLMENT PARTICIPATION

by

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This dissertation is submitted in partial fulfillment of the
requirements for the degree of

Doctor of Education

Ferris State University

December 2014

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ABSTRACT

This study is an examination of the significance and influence of the distance in miles between high school and community campuses on dual enrollment participation of dual enrollment eligible twelfth grade students in Michigan. A quantitative approach was selected by the researcher to examine descriptive statistics of dual enrolment participation rates and patterns, along with significance and influence relationship analyses of distance in miles of roadway between community college and high school campuses in Michigan. Participants in this study include all dual enrollment eligible twelfth grade public school students (LEA, ISD, and PSA). Statistical analysis suggests that the highest rate of dual enrollment participation comes from students living in rural areas, and the least rate of participation from students residing in large urban environments. Determining the level of significance and influence of distance in miles of roadway between high school and community college campus on dual enrollment participation in Michigan, the researcher is unable to arrive upon a statistically significant relationship between the dependent (participation) and independent variable (distance in miles between campuses). Influence testing reveals little influence of the variables upon one another. In conclusion, twelfth grade dual enrollment eligible students living in rural locations tend to participate in dual enrollment at a greater level of frequency than those in urban locales.

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CHAPTER 1

INTRODUCTION

Over 9.6 million students are enrolled in rural school districts across the United States. The national average of schools per state classified as rural schools is 33%, with states varying considerably, from a low of 6.6% in Massachusetts to a high of 78.6% in South Dakota. Michigan ranks 34th in the nation with 31% rural schools (percent of rural schools is the percentage of regular elementary and secondary schools designated as rural by the National Center for Education Statistics) (Strange, Showalter, & Klein, 2012, pp. 5, 49). Despite concerted efforts to increase participation among traditionally underrepresented students, the distributional consequences of participation of dual enrollment students in urban, suburban, towns, and rural areas remains largely unexplored (Speroni, 2011). The state of Michigan currently enrolls over 301,000 students who are classified as rural students by the National Center for Education Statistics (NCES), one of the largest absolute rural student enrollments in the nation. The national median of rural students per state is 141,486 (Strange et al., 2012, p. 49).

There is a lack of comprehensive focus on the influence and significance of distance between high school and community college campuses as it affects dual enrollment participation nationally or locally. Likewise, an absence of research exists regarding dual enrollment patterns of urban, suburban, small town, and rural students. Understanding the influence and significance of distances that separate urban, suburban, small town, and rural students from local community college campuses will allow community college dual enrollment leaders in refining and developing techniques

to reach greater numbers of potential dual enrollees. Focusing on the state of Michigan and all public high school campuses therein, this study seeks to identify the dual enrollment participation rates of urban, suburban, town, and rural students, as well as to identify the distance between high school and community college campuses and the mean dual enrollment student participation rate per high school building, and to perform statistical significance and influence testing to determine what, if any, effect distance influences participation in dual enrollment.

This study is highly significant as it is the first of its kind to identify and isolate distance in miles between community college campuses and the related significance and influence on dual enrollment participation rates. Although not generalizable to other states, this study will not only provide dual enrollment practitioners and scholars with valuable information on significance and influence, but will guide future research in developing and identifying variables that may influence student dual enrollment participation decisions. Future researchers utilizing mileage between campuses as variable can begin to build comprehensive databases of potential variables that may influence students' dual enrollment decisions in an attempt to better understand why students choose or do not choose to participate in dual enrollment courses in high school, allowing practitioners to develop partnerships and programs and to refine techniques that encourage early participation in college.

Although the state of Michigan's system of higher education is highly autonomous with the majority of community colleges and universities governed by elected boards with little state oversight, Michigan dual enrollment legislation and reimbursement policies are highly favorable toward dual enrollment of high school students in collegiate coursework. Qualifying students, as early as 9th grade, can participate in dual enrollment courses and have their tuition paid by their local school

district. Michigan high school students have the opportunity to take as many as 10 total dual enrollment courses during their high school careers, earning valuable collegiate credit with little or no out-of-pocket cost to the student. The opportunity for high school students to earn collegiate credit at little or no cost while simultaneously earning high school credits is especially important as postsecondary educational costs continue to exponentially rise. In 2013-14, the average published tuition and fees for in-state students at public four-year institutions was \$8,893, with the average published tuition and fees at public two-year colleges being \$3,264 (The College Board, 2013b, p. 3). The cost of tuition and fees increased from \$5,900 in 2003-04 to \$8,893 in 2013-14 at public four-year institutions, a 40% change in 10 years. The cost in tuition and fees increased from \$2,425 in 2003-04 to \$3,264 in 2013-14 at public two-year institutions, a 29% change in 10 years. Tuition and fee pricing is especially important when considering the growth in student debt. Total outstanding debt was just over twice as large in 2012 as it had been in 2005 (\$962 billion compared to \$461 billion in 2012 dollars), the average outstanding debt per borrower being 33% higher in 2012 than 2005 (having increased from \$18,600 in 2012 dollars in 2005 to \$24,800) (The College Board, 2013c, p. 22). The cost of collegiate credits being directly linked with increases in student debt speaks to the importance of accumulating collegiate credit at little or no cost, as provided in dual enrollment opportunities.

Also, the ability for high school students to jump-start their higher educational careers through dual enrollment courses while still in high school not only exposes them to collegiate-level coursework, but also increases their likelihood to earn a high school diploma, enroll in a community college or university, and enroll in college full-time than peers who do not participate in dual enrollment (Karp, Calcagno, Hughes, Jeong, & Bailey, 2007).

Early exposure to college-level coursework while in high school is especially important to at-risk students. Providing dual enrollment programs to raise the level of educational attainment among low-SES (socioeconomic status) students has been a consistent strategy of educational leaders and national policy makers to fight low levels of attainment among low-SES students (An, 2012, p. 1). Studies have shown that low-SES students may benefit more from dual enrollment coursework than high-SES students (Karp et al., 2007). Rural students consistently lag behind their suburban and urban counterparts in collegiate degree attainment largely attributable to their low SES level. When comparing with urban and rural samples, rural youth face more serious economic challenges in attending college and earning a degree (Byun, Meece, & Irvin, 2011, p. 431). Rural students also face challenges of parental education and involvement, access to transportation, research materials and technology, ability to participate in after-school and optional programs—all of which affect the student's secondary educational and social experience. Dual enrollment is an opportunity to reach students most likely not to complete a collegiate credential and influence their future through early exposure to college-level coursework and the larger collegiate experience, experiences that are likely to significantly influence persistence and degree attainment.

Research Question and Hypothesis

The primary research question is twofold: (1) At what rate (percentage) do eligible 12th grade students participate in dual enrollment relative to NCES-UCLC (Urban-Centric Locale Codes) classifications in Michigan? and (2) What is the significance and influence of distance in miles of roadway between high school and community college campus on dual enrollment participation in Michigan?

Utilizing descriptive statistics analysis as well as significance and influence testing, the researcher seeks to address the hypothesis: *There is a difference in the*

percentage of dual enrollment eligible students who dual enroll in urban versus rural areas in Michigan.

A qualitative approach that utilizes descriptive statistical analysis will not only serve to provide community college practitioners and leaders with a baseline understanding of urban, suburban, town, and rural dual enrollment participation disbursement, but will also demonstrate which NCES classification codes have the highest and lowest rate of dual enrollment participation in Michigan. The researcher seeks to provide an “at a glance” perspective of where high and low levels of dual enrollment occur in the state of Michigan through descriptive statistics. The dependent variable, aggregate high school dual enrollment participation rates, coupled with the independent variable, miles between high school and community college campuses, lends itself to significance analysis utilizing *p*-value and influence testing examining Cohen’s *d* and effect-size *r*. Scientific statistical analysis will inform the researcher whether or not the variable is significant and inform what effect the variable may have on the dependent variable.

The rationale for this approach is rooted in the need to provide a comprehensive descriptive profile of student participation for urban, suburban, town, and rural students. An “at a glance” perspective of where high and low levels of dual enrollment occur in the state of Michigan through descriptive statistics has not currently been researched in a formal fashion. Community college leaders presently have no means of analyzing local dual enrollment participation rates relative to their institution’s geographic peers. Likewise, researchers attempting to understand significant influences on student dual enrollment participation have not isolated mileage between campuses as a variable of independent inquiry. Providing a comprehensive analysis of dual enrollment participation, where it occurs (urban, rural, etc.), and the significance of mileage between

campus locations will dually inform practitioners and researchers in understanding of how the geographic location and classification of students living in urban or rural areas may affect dual enrollment participation.

Formatted in a traditional research fashion, the Literature Review examines the legislation and defines dual enrollment in Michigan, the scholastic benefits of high school dual enrollment participation, and the influence of low SES and rurality on student participation in dual enrollment and related secondary educational opportunities. The Methodology chapter re-introduces the research problem—questions and hypothesis; explores the NCES classification system; and describes the study construct—participants, data development, collection, measurement, and procedures. The multiple tables and figures form the breadth of the Findings chapter as well as the results of descriptive statistic collection and composition as well as statistical analysis output. The Discussion and Implications chapter concludes with contextualization of the findings as it applies to community college leaders, dual enrollment practitioners, and future researcher inquiry into the variables that may influence dual enrollment participation.

Terms

AP – Advanced Placement: The state of Michigan defines advanced placement courses, commonly referred to as “AP courses” or “AP,” as participation in nationally recognized courses in subjects that provide students with the opportunity to take college level courses that are taught by AP trained high school teachers (Michigan Department of Education, 2012). AP course instructional delivery and course locations are at the local high school or online; are taught by high school teachers that are certified to teach AP courses (not adjunct or postsecondary faculty); and, most notably, to earn college credit in an AP course the student needs to earn a minimum score of 4 out of a possible 5 on an AP college credit test, depending on the type of assessment and the

postsecondary institution's policies (Michigan Department of Education, 2012). This is in contrast to direct college credit/concurrent enrollment, dual enrollment, enhanced dual enrollment, early/middle college programs, and early/middle college schools whose courses count for high school credit and college credit by passing the course at an accepted standard (Michigan Department of Education, 2012).

CE – Concurrent Enrollment: Postsecondary faculty members providing courses in a high school classroom. Courses may count for high school credit and/or college credit, or both depending upon the partnership agreement (Michigan Department of Education, 2012).

CEPI – State of Michigan Center for Educational Performance and Information: The Center for Educational Performance and Information collects and reports data about the performance of Michigan's K-12 public schools and students. CEPI initiatives in data collection and reporting facilitate school districts' compliance with the federal No Child Left Behind Act of 2001 and the Michigan Department of Education's accreditation plan, Education YES! CEPI also provides unprecedented access to information about Michigan's schools for parents, educators, and policy makers (Center for Educational Performance and Information, 2003).

DE – Dual Enrollment: High school students attend at least one high school course and simultaneously attend a degree-granting postsecondary institution. Courses can count for high school credit, college credit, or both (Michigan Department of Education, 2012).

DC – Direct Credit: Courses that provide students with the opportunity to take college level courses at the high school building. These courses are generally taught by high school teachers who are adjunct faculty and taught to cohort high school classes (Michigan Department of Education, 2012).

EMCP – Early/Middle College Programs: Five-year school programs designed to allow a pupil to earn a high school diploma and substantial college credit through an additional fifth year of study. Students earn college credits through dual enrollment. Courses can count for high school credit, college credit, or both (Michigan Department of Education, 2012).

EMCS – Early/Middle College Schools: A stand-alone public high school, a school within a school, a Public School Academy (PSA or Charter School), or a Shared Educational Entity (SEE) designed to allow a pupil to earn a high school diploma and either an associate's degree, technical certification, or up to 60 transferable college credits at the same time. A fifth year is added to the school's curriculum to support this outcome. The schools provide students with both a high school diploma and up to 60 college credits, which are transferable to most state colleges and universities. Students earn college credit through dual enrollment (Michigan Department of Education, 2012).

EDE – Enhanced Dual Enrollment: A formalized dual enrollment system that provides deliberate support for students in their college credit earning attempts while still in high school. Courses can count for high school credit, college credit, or both (Michigan Department of Education, 2012).

IB – International Baccalaureate: An international educational curriculum administered by the International Baccalaureate Organization granting individual courses and diplomas based on an international secondary scholastic model of education (International Baccalaureate n.d.-b).

ISD – Intermediate School District: An Intermediate School District provides various administrative services and cooperative, coordinated educational services among many school districts in the name of economy and efficiency (Center for Educational Performance and Information, 2014).

K-12 Districts: Public educational agencies (ISD, LEA, or PSA).

LEA – Local Education Agency: A Local Education Agency is a public school operating in accordance with statutes, regulations, and policies of the Michigan Department of Education. An LEA has a set geographical boundary and may include any grade configuration along with educational settings (e.g., alternative education, special education, career and technical education) (Center for Educational Performance and Information, 2014).

NCES – National Center for Education Statistics: The National Center for Education Statistics is the primary federal entity for collecting and analyzing data related to education in the U.S. and other nations. NCES is located within the U.S. Department of Education and the Institute of Education Sciences. NCES fulfills a Congressional mandate to collect, collate, analyze, and report complete statistics on the condition of American education; conduct and publish reports; and review and report on education activities internationally (U.S. Department of Education, 2014).

NCES UCLC – National Center for Education Statistics Urban-Centric Locale Codes: The National Center for Education Statistics Urban-Centric Locale Codes are a measure of geographic status on an urban continuum that ranges from “large city” to “rural,” in agreement with geographic standards used in the 2000 decennial census (U.S. Department of Education, n.d.).

- *City, Large – NCES UCLC Large City Classification:* Territory inside an urbanized area and inside a principal city with population of 250,000 or more (National Center for Education Statistics, 2013).
- *City, Midsize – NCES UCLC Midsize City Classification:* Territory inside an urbanized area and inside a principal city with population less than 250,000 and greater than or equal to 100,000 (National Center for Education Statistics, 2013).
- *City, Small – NCES UCLC Small City Classification:* Territory inside an urbanized area and inside a principal city with population less than 100,000 (National Center for Education Statistics, 2013).

- *Suburb, Large – NCES UCLC Large Suburb Classification:* Territory outside a principal city and inside an urbanized area with population of 250,000 or more (National Center for Education Statistics, 2013).
- *Suburb, Midsize – NCES UCLC Midsize Suburb Classification:* Territory outside a principal city and inside an urbanized area with population less than 250,000 and greater than or equal to 100,000 (National Center for Education Statistics, 2013).
- *Suburb, Small – NCES UCLC Small Suburb Classification:* Territory outside a principal city and inside an urbanized area with population less than 100,000 (National Center for Education Statistics, 2013).
- *Town, Fringe – NCES UCLC Fringe Town Classification:* Territory inside an urban cluster that is less than or equal to 10 miles from an urbanized area (National Center for Education Statistics, 2013).
- *Town, Distant – NCES UCLC Distant Town Classification:* Territory inside an urban cluster that is more than 10 miles and less than or equal to 35 miles from an urbanized area (National Center for Education Statistics, 2013).
- *Town, Remote – NCES UCLC Remote Town Classification:* Territory inside an urban cluster that is more than 35 miles from an urbanized area (National Center for Education Statistics, 2013).
- *Rural, Fringe – NCES UCLC Fringe Rural Classification:* Census-defined rural territory that is less than or equal to 5 miles from an urbanized area, as well as rural territory that is less than or equal to 2.5 miles from an urban cluster (National Center for Education Statistics, 2013).
- *Rural, Distant – NCES UCLC Distant Rural Classification:* Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an urban cluster (National Center for Education Statistics, 2013).
- *Rural, Remote – NCES UCLC Rural Remote Classification:* Census-defined rural territory that is more than 25 miles from an urbanized area and is also more than 10 miles from an urban cluster (National Center for Education Statistics, 2013).

Private – Private K-12 High Schools: A non-state-supported school granting high school diplomas in accordance with Michigan law.

PSA – Public School Academy or Charter School: A state-supported public school without geographical boundaries. A public school academy may include any grade up to grade 12, including kindergarten and early childhood education, or any

configuration of those grades as specified in its contract (Center for Educational Performance and Information, 2014).

CHAPTER 2

LITERATURE REVIEW

Introduction

The literature review opens by introducing and explaining Michigan's system of dual enrollment. Positive student outcomes associated with dual enrollment participation are synthesized with specific emphasis on dual enrollment as a means a collegiate preparedness (early screening) and academic and social challenges of the college experience. Researcher findings on dual enrollment participation's effect on high school graduation, collegiate enrollment, and achievement are presented. Early introduction into the collegiate "real world" experience is reviewed at length with key findings on dual enrollment's effect on campus familiarization, comfort, and collegiate expectations. Diverse career and technical education opportunities that dual enrollment students may participate are hypothesized as a means to increase participation and representation for the non-university bound high school student. Researcher findings on low-SES and rural student postsecondary educational participation and success are analyzed and the effect of dual enrollment participation of said students is examined in context.

Dual Enrollment in Michigan

The opportunity for Michigan high school students to simultaneously enroll in institutions of higher education (community colleges and four-year universities) while completing state mandated requirements of K-12 coursework draws its roots from two landmark pieces of state legislation: Public Act 160 of 1996, the Postsecondary Enrollment Options Act, and Public Act 258 of 2000, the Career and Technical

Preparation Act (Michigan Department of Education, 2013). These bills have come to be known as the Michigan “Dual Enrollment” bills. These bills modify and expand on provisions of the State School Aid Act providing for students to earn college credit while in high school. The bills also require that the board of a school district or public school academy ensures that each student in eighth grade or higher be given information about college course-taking opportunities (Michigan Department of Education, 2013).

The purpose of Public Act 160 of 1996, the Postsecondary Enrollment Options Act, is to provide a wider variety of options to high school pupils by encouraging and enabling qualified pupils to enroll in courses or programs in eligible postsecondary institutions (State of Michigan, 1996). Public Act 258 of 2000, the Career and Technical Preparation Act, expands learning options to high school pupils by encouraging and enabling qualified pupils to enroll in courses or programs in career and technical preparation programs at eligible postsecondary educational institutions (State of Michigan, 2000).

The state of Michigan has defined a qualified or eligible pupil as a student who is enrolled in at least one high school class in a school district or state-approved nonpublic school in Michigan and who has not been enrolled in high school for more than four school years, including the school year in which the student seeks to enroll in an eligible course; has achieved 11th or 12th grade student status; and has achieved a qualifying score on the Michigan merit assessment or other assessment deemed appropriate for measurement of student readiness (State of Michigan, 1996, 2000). Qualifying assessment scores are on prescribed state standards on the following standardized assessments: EXPLORE, PLAN, ACT, COMPASS, MME, PSAT, SAT, ACCUPLACER, or any national or industry-recognized job skills assessment as determined by the

superintendent of public instruction (Michigan Department of Education) (State of Michigan, 2000).

The Postsecondary Enrollment Options Act of 1996 defines eligible courses as postsecondary courses that are offered for credit that are not offered by the school district, or a course that is offered by the local school district that is not available to the student because of a scheduling conflict that is beyond the control of the student. Further, the eligible course must be an academic course not ordinarily taken as an activity course. Courses must be ones in which a postsecondary institution applies toward satisfaction of degree requirements; is not a hobby or recreational course; and is in a subject area other than that of physical education, theology, divinity, or religious education (State of Michigan, 1996). Dual enrollees are limited to no more than 10 courses overall. Expanding this definition, the Career and Technical Preparation Act of 2000 defines eligible courses as a course offered by a career or technical program that is offered for postsecondary credit or is part of a non-credit occupational program leading to an industry-recognized credential that is not offered through the school district, Intermediate School District, or area vocational-technical educational program (State of Michigan, 2000). Operationally defined, eligible courses are regarded as courses that are not offered by the local school district or courses that are offered but are not able to be reasonably attended by the pupil. This includes traditional postsecondary courses as well as health, trade, and/or occupational disciplines.

Eligible postsecondary institutions are legislatively defined as community colleges established under the Community College Act of 1966, or under part 25 of the revised school code, or a federal tribally controlled community college located in Michigan that is recognized under the Tribally Controlled Colleges and Universities Assistance Act of 1978, and is determined by the state to meet the requirements for

accreditation by a recognized accrediting body (State of Michigan, 1996, 2000). State universities are legislatively defined as state institutions of higher education described in sections 4, 5, and 6 of Article VIII of the State of Michigan Constitution of 1963 (State of Michigan, 1996, 2000).

These dual enrollment bills stipulate eligible charges as tuition, fees, mandatory course material fees, registration fees, and any late fees charged by an eligible postsecondary institution as a result of the school district or state treasury department's non-payment of charges resulting from dual enrollment participation of students. Eligible charges do not include parking passes, transportation fees, activity or technology fees, books, or optional course materials (State of Michigan, 1996, 2000). Defining eligible charges is important as through these separate yet nearly identical bills; eligible postsecondary institutions are provided payment for academic coursework of the student on behalf of the state Department of Treasury (State of Michigan, 1996, 2000). The state Department of Treasury acts on behalf of the student's local school district by reimbursing the postsecondary institution an amount equal to the lesser of the amount of the eligible charges or the prorated percentage of the statewide pupil-weighted average foundation allowance, as calculated under section 20 of the state School Aid Act of 1979 (State of Michigan, 1996, 2000).

Local school district funding in Michigan is governed under Proposal A of 1994. This funding mechanism is in the form of the foundation allowance, whereby each school district is guaranteed a per pupil amount—in combined state and local funds—to support school operations (Wickshall, 2011). The foundation allowance for each district is based on a formula provided by the State of Michigan that is based largely on state economic health, taxation revenue and number of student pupils per local school district. Through the foundation allowance subsidy, the state Treasury Department subtracts the eligible

dual enrollment charges from the local school district and reimburses the postsecondary tuition from the annual foundation allowance award, which is awarded on a per-pupil basis for each local public school district. The result of eligible postsecondary charges and direct reimbursement of fees via the local school district's foundation allowance provides participant dual enrollment students with postsecondary credits without a direct per-unit tuition cost to the student.

Hypothetical Reimbursement Example

For Michigan high school that is on semesters and a postsecondary institution also on semesters, a reimbursement breakdown would be calculated as follows:

FY 2013-13 statewide weighted foundation allowance is \$7,500, which would equal \$3,750 per semester. If there were 6 hours per high school day, each hour would equal \$625 ($\$3,750 \div 6$) per course. Under this scenario, the local school district would be responsible for the actual charges of tuition and fees up to the amount of \$625 or the actual amount charged by the postsecondary institution per course, whichever is less.

The actual tuition and fees charged by the postsecondary are based on the in/out of district tuition rate and applicable charges assessed on a per credit hour basis. For example, Adams Community College charges in-district tuition of \$140 per credit hour and \$75 in applicable course fees. The cost of a three-credit course would be \$495 ($\$140 \times 3 + \75). This calculation would be less than the \$625 allotted under the foundation allowance guidelines, resulting in reimbursement being calculated using actual tuition and fees charged by the postsecondary institution.

Michigan Senate Bills 622 & 623 and 709 & 709 of 2011 became Michigan Public Acts 131, 132, 133, and 134 on May 15, 2012, significantly expanding dual enrollment opportunities for eligible high school students. This recent legislation amends the Postsecondary Enrollment Options Act and the Career and Technical Education Act, to broaden the guidelines for students eligible to participate in dual enrollment. Specifically, the bills modify the following:

- Remove the requirement that a student be in at least grade 11 to participate in dual enrollment.

- Include in the definition of "eligible student" a student enrolled in a state-approved nonpublic school and a home-schooled child enrolled in high school.
- Extend repayment provisions to nonpublic schools and home-schooled students.
- Clarify that an eligible course is one offered for postsecondary credit.
- Allow a student to take not more than two eligible courses per academic year for the student's first, second, or third academic year of dual enrollment, and not more than four courses during the student's fourth academic year of dual enrollment.
- Require repayment by a public, non-public, or home-schooled student who successfully enrolled in an eligible course for postsecondary credit only and did not successfully complete it.
- Include a tuition limit for community colleges in the definition of "eligible charges," such that the tuition rate used to determine eligible charges is the tuition rate for residents of the community college district regardless of the residency status of the eligible student (Michigan House Fiscal Agency, 2012).

In summary, key changes of this combined legislation removes previous requirements that students must be enrolled in at least 11th grade, allows state-approved nonpublic and home-schooled children to enroll in dual enrollment courses, and sets community college tuition reimbursement rates to be assessed as "in district" or "resident" tuition status regardless of the residency of the eligible student. Finally, the legislation includes new limits on the number of dual enrollment courses that could be taken by any eligible student (public, nonpublic, or home-schooled), by amending the definition of "eligible course." Specifically, a course would be eligible if it did not exceed the following limits: not more than two courses per academic year for the student's first three years of dual enrollment, or not more than four courses per academic year for the student's fourth year of dual enrollment (Michigan House Fiscal Agency, 2012). These changes open the doors for all eligible high school students, including private and parochial schools, in the state of Michigan to dual enroll in courses in approved postsecondary institutions paid for by the State of Michigan Department of Treasury

Positive Student Outcomes Associated with Dual Enrollment Participation

Dual enrollment opportunities are a means of increasing the strength of the high school curriculum for all students, regardless of their intellectual gifts or socioeconomic status (SES). The strength of the high school curriculum is more reliable than other measures of secondary academic performance such as test scores or class rank/academic GPA on bachelor's degree attainment (Adelman, 1999, p. 19). Venezia, Kirst, and Antonia (2003) found that a major cause of insufficient secondary students' preparation for college concerns the disjuncture between public K-12 and postsecondary sectors. This disjuncture can impede successful transitions between the systems and diminishes educational opportunities for many students, particularly for those who are traditionally underrepresented in postsecondary education (p. 8). One of great problems of high school students' transitioning into college is that once they enroll, many students are startled to learn that getting into a college is often the easiest step. While students' high school academic record does little to influence their ability to attend some colleges, that record is strongly related to success once the student is in college. Another problem is that students fail to understand what will be expected of them in postsecondary education (Bailey, Hughes, & Karp, 2002). Completing a degree, or even enrolling in college-level courses, requires higher levels of academic preparation. In short, simply graduating from high school does not ensure that a student will be ready for college-level courses (U.S. Department of Education, 2001). K-16 schools collaborate insufficiently with each other to align curriculum and academic content, admissions procedures, and expectations for students (National Commission on the High School Senior Year, 2001, p. 4). The current organization of secondary schools and postsecondary institutions is such that policymaking communication between levels is often difficult (Venezia et al., 2003, p. 14).

In an interview of K-12 and postsecondary interviewees from multiple states, interviewees consistently stated that no one (from K-12 and postsecondary institutions) asked them to participate in devising the other's standards or assessments of learning outcomes (Venezia et al., 2003, p. 22). Not only is communication difficult between secondary and postsecondary educators, the majority of high school teachers in a survey by the Southern Regional Educational Board found that they never interact with their peers from elementary and middle schools about the crucial issues of curricular alignment (National Commission on the High School Senior Year, 2001, p. 5). Many high school graduation standards do not meet the demands required by college entrance or placement requirements, but that is rarely published by high schools or colleges (Venezia et al., 2003, p. 24). Colleges must become active players and reinforce at the high school level (Adelman, 2006, p. 108). The K-12 and postsecondary sectors can and should share responsibility for dual enrollment students. Dual enrollment can, and should be, a mechanism for aligning secondary and postsecondary curriculums, not merely a strategy for moving students out of high school (Krueger, 2006). It is increasingly clear that secondary schools must provide the student with maximum opportunity to learn, which is not merely course titles, but course substance that will propel academic growth (Adelman, 2006, p. 108). Dual enrollment requires the engagement of college faculty with high school personnel and their students, directly or indirectly (Hughes, 2010). High schools must establish, reestablish, or strengthen lines of communication with local postsecondary institutions in anticipation of a more extended dialogue (Conley, 2001, p. 36). Communicating preparedness, enrollment, and persistence with colleges and universities where the bulk of high school students attend can help the local K-12 district identify strengths and weaknesses of graduates, allowing

the school district to make changes in curriculum to better prepare students for the demands of a postsecondary education.

Structured in two very different systems, each serving different local, state, and federal interests, our American system of education is in need of reform. In the absence of top-down legislative reform, dual enrollment partnerships can link educators from the bottom up in partnerships to collaborate on secondary and postsecondary curriculums that, if nurtured, can penetrate primary, secondary, and postsecondary curriculums alike. High school standards and postsecondary standards are rarely consistent. The high school senior year, as we know it, has no formal assessments, de-emphasizing the need to take core courses in the senior year, especially if the students have already met high school graduation requirements. In addition, college admission policies usually do not stress second semester senior year grades. These messages send the signal to students that they do not need to engage in challenging courses in their senior year (Venezia et al., 2003, p. 15). Students often suffer from “senioritis.” They view the senior year, particularly the second semester, as a reward for participating in 12 years of schooling (Conley, 2001, p. 26). The effects of this extended academic vacation from academic work can be severe when students reach college (Adelman, 1999). For this and a variety of other reasons, student motivation drops in the senior year. Short of a miserable failure, practically all college-bound students know what they have accomplished through Grade 11 will largely determine whether or not they attend college and, if so, which college. As a result, student focus switches to college acceptance and often minimizes the importance of the senior year of postsecondary education (National Commission on the High School Senior Year, 2001).

One problem with the current structure of the K-12 senior year is the failure of linking students with the academic and social world students will enter after high school.

Discovered through interviews with students who want to attend college after high school, many confessed that they have a certain level of apathy about the college preparation process, many of whom have not been involved in any college preparation activities (Venezia et al., 2003, p. 29). High schools have difficulty connecting students with this world; the linkages appear tenuous as best and, at times, almost non-existent (Conley, 2001, p. 27) from the student's perspective. Venezia et al. (2003) found that many K-12 students do not have a good sense of what is expected of them in college, and most K-12 educators do not know how to help students gain an understanding of those standards (p. 22). Dual enrolment is seen as a way to increase the intensity and rigor of the high school curriculum. It is this intensity that is most closely connected to students' future success in college; it is hypothesized that challenging students through dual enrollment programs will lead to high levels of college success (Bailey et al., 2002, p. 11; Hughes et al., 2012, p. 6). Some colleges partner with high schools in reporting applicants' scores on placement examinations to their high schools. Through her research, Orr (1999) found that high school teachers were surprised to learn how poorly their students had performed on the tests. One method to inspire college seniors to make the most of their senior year comes from the military. Hanson (2006) offers an indelible approach by which community colleges can motivate students—the military, with respect for first-time enrollees. In the case of the Air Force, the historical call was to "aim high." The Army issued a challenge to "be all you can be," and the Navy concurrently implores recruits to "accelerate their lives." These institutions challenge perspective service people to use their individual abilities to support a higher purpose (Hanson, 2006, p. 134). High school and community college dual enrollment leaders can use the opportunity for diverse curricular offerings—traditional college prep for the university bound, transfer and degree completion for general aspirants—to encourage

and support to students to enroll early in college through dual enrollment. Providing students with dual enrollment opportunities and inspiring them to take charge of their educational social futures during the senior year is seen as an opportunity for both students and institutions of higher learning.

The conditions of modern life demand that all students graduate from a rigorous academic program that equips them with the knowledge and skills needed to succeed in both postsecondary education and careers (National Commission on the High School Senior Year, 2001, p. 2). Students who dual enroll early in the secondary curriculums allow postsecondary institutions to assess their preparedness for the college curriculum through assessment measures such as EXPLORE, PLAN, ACT, COMPASS, MME, PSAT, SAT, ACCUPLACER, or other institutional assessments. This valuable educational planning information can be used by parents, secondary schools, and postsecondary institutions as an early indicator of academic unpreparedness, allowing the institutions and students to work collaboratively in preparation for the collegiate curriculum well in advance of high school graduation. If the school does not have curriculum options for students with the ability/desire for advanced curricular options and is not able to take part in these opportunities, students may find school tasks too easy and therefore never learn how to study properly. Just because a student is smart does not mean the student will know how to study, synthesize, analyze, or organize information and present themselves in a suitable academic manner (Burney & Cross, 2006). Early opportunities for dual enrollment, placement testing, and participation in an advanced secondary curriculum are ways in which students can develop proper academic study habits, preparing themselves for the challenges of college academia well ahead of the non-academic adjustments that students will face as they develop into independent young adults.

Dual Enrollment on Postsecondary Enrollment and Achievement

A study that examined the dual enrollment's participation effect on high school graduation rates found that students who participated in dual enrollment were more likely to earn a high school diploma, enroll in a community college or university, and enroll in college full-time than peers who did not participate in dual enrollment (Karp et al., 2007). Since its inception, dual enrollment has provided an alternative for students to prepare for postsecondary education by allowing students to participate in college coursework in lieu of some high school courses that have labeled as non-challenging, repetitious classes. Such classes may meet high school exit standards but do not prepare and challenge students to succeed in credit-generating college courses (Kisker, 2006, p. 71). Empirical evidence of dual enrollees' rates of postsecondary enrollment after high school graduation, as well as their achievement once in the postsecondary system, is the true bellwether in assessing outcomes of dual-enrolled high school students. Current research also suggests that participating in dual enrollment programs improves students' likelihood of continuing on and completing degrees in postsecondary education (Swanson, 2010, p. 46). When students can experience success early in a challenging curriculum, they develop confidence in their own ability to handle difficult academic work (Burney & Cross, 2006, p. 19). Participation in dual enrollment program suggests statistically significant effects upon students' academic momentum. By accumulating credits in high school, students create a nest-egg effect, thereby influencing their decisions to remain in college (Swanson, 2010, p. 44). Although somewhat dated, in their study of the effects of timing when one enters a postsecondary educational system, Kempner and Kinnick (1990) determined that baccalaureate attainment hinges on "catching the window of opportunity" that opens soon after high school completion.

Delaying entry to college, for whatever reason, greatly diminished the odds of acquiring a four-year degree.

Numerous researchers have studied the impact of dual enrollment participation on student outcomes and success. Swanson (2010) found that students who participated in dual enrollment programs were 12% more likely to enter college within seven months of high school graduation than nonparticipating students. Also, those who participated in dual enrollment programs in high school and completed 20 or more credits in the first year of college were 28% more likely to persist through the second year in college than were students who did not participate in dual enrollment courses (2010). Hughes, Rodriguez, Edwards, and Belfield (2012) found that graduation rates were higher for dual enrollees than their peers (p. 21). It appears that dual enrollment is associated with slightly better enrollment, persistence, GPA, and total credits in secondary education (Lewis & Overman, 2008, p. 199). Dual enrollment participation has also been found to be associated with numerous positive educational outcomes, including postsecondary enrollment and achievement (Karp et al., 2007; Kim & Bragg, 2008; Speroni, 2011; Swanson, 2008). A study examining the preparedness of Florida students who have taken one dual enrollment course in subsequent courses found over three quarters (77.04%) of students who successfully completed one course completed a subsequent course successfully. Only 5.8% of students in the study received a failing grade in the subsequent course, whereas 17.28% received grades such as “incomplete” or “withdrawn.” When compared with other students in the Florida State University System (SUS) that had not participated in dual enrollment course in the secondary system, dual enrollment students were statistically more successful in their subsequent course. It was found that dual enrollment students were more likely to have received

grades of “A” or “B” when compared with their SUS counterparts (Windham & Perkins, 2006).

Speroni (2011) found that students participating in both AP and dual enrollment courses are strongly associated with college access and degree attainment, but found important differences in outcomes across programs. Dual enrollment students are, on average, more likely to go to college after high school; AP students are more likely to enroll in a four-year institution. Despite this difference in initial enrollment tendency, the difference between dual enrollment students and AP students in terms of bachelor’s degree attainment is small and not statistically robust in the model of analysis employed (Speroni, 2011, p. 33). It was suggested by Adelman (2006) that the first year of college has to begin in high school, if not by AP, then by the growing dual enrollment movement (p. 108).

In examining the effect of dual enrollment programs in Florida and New York on student outcomes and success, Karp et al. (2007) found Florida students have several consistently positive and statistically significant differences in outcomes. Dual enrollment students were more likely than comparison students to earn a high school diploma, to enroll in postsecondary education in the state university system, to enroll in college full-time, and to have higher grade point averages (after the first and fourth semesters and cumulatively) (p. 73). Karp et al. acknowledged that differences between the two states’ secondary and postsecondary educational systems may impact observed results in a statistical sense (Florida students earning more credits, etc.), yet the positive correlation of dual enrollment student success between the two states is significant. It is important to recognize that other unmeasured factors, such as student motivation or parental encouragement and support, are likely to be correlated with participation in dual enrollment and are likely also likely to generate a positive effect. By not controlling for

important factors affecting a student's decision to participate in dual enrollment, it is possible that our models may generate what appears to be positive impacts when in fact there are no such impacts or there are negative impacts (Lewis & Overman, 2008, p. 194).

Dual Enrollment on College Campus Familiarization and Comfort

Students participating in dual enrollment often leave the high school campus and take their postsecondary courses at another campus, immersing themselves in the experience of college and "adult" life every time they step foot onto the college campus. Among secondary institutions that offered dual enrollment opportunities in the 2010-11 academic years, 83% reported courses within dual enrollment programs were taught at the college campus, 64% reported courses were taught at the high school campus, and 48% of reported courses were taught through distance education programs (U.S. Department of Education, 2013).

Graduating from secondary to postsecondary education can be a difficult transition for some students. The ability for students to dual enroll in postsecondary coursework while still in high school not only is an option to increase educational rigor and motivate students for continued academic success, but it allows students to share important common elements of strong academics directly keyed to postsecondary standards, increased student engagement through diverse and challenging courses, and attendance on a college campus that offers exposure to adult expectations and milieu, which often supports and ensures success (Lerner & Brand, 2006, p. 5). Indiana University-Purdue University Indianapolis (IUPUI) developed a unique program in partnership with local secondary students to integrate high school students into the collegiate campus. Most students participating in the Special Programs for Academic Nurturing (SPAN) are high schoolers, but there are also younger students, including 13-

year-olds and, most recently, a 9-year-old (Kronholz, 2011, p. 29). A student participating in the SPAN program on the campus of IUPUI references a “glimmer of hope” that young students can experience when they take courses on campus, as well as the satisfaction of knowing that they are learning and engaging in what was labeled “productive” work (Kronholz, 2011, p. 29). Focusing less on rules and giving students greater freedom and greater responsibility for their own work, as well as treating them as adults in the classroom, distinguished college classes the most from high school classes (Hughes et al., 2012, p. 29).

Course location is significant as it strongly influences which students have access, whether the course is perceived as authentic, and the availability of support services. Location on the college campus provides the most authentic college experience, and students benefit from the academic and other support services available on campus (Hughes et al., 2012, p. 27). A dual enrollment class should be perceived by students as an authentic college experience where they can “try on” the college student role and view themselves as capable of doing college work. When dual enrollment students are mixed with regular college students, they are likely to display greater maturity and feel their college experience is authentic (Hughes et al., 2012, p. 6). As many dual enrollment programs include time on campus and expose students to the non-academic side of college, this can serve as a demystifying experience for students, allowing them to acclimate to college earlier (Bailey et al., 2002 p. 13). Experiences on the collegiate campus allow students to identify and become comfortable with resources that they will be utilizing throughout their high educational careers: libraries, counseling services, student centers, and tutoring services, to name a few. Providing dual enrollment students with the opportunity to experience college life while still in high school provides them with realistic expectations of what to expect in college and eases

the assimilation from high school to college. Project Aspire counselors experienced that one of the greatest possibilities of success for rural students was when they arranged for campus visits, taking them on planned visits from familiarize them with the campus, and helping them develop an understanding of the college experience (Burney & Cross, 2006, p. 19). Because many parents lack the background to assist students with homework, school personnel need to provide consistent, comprehensive, and ongoing support to help the student persist in a strong high school curriculum. Rigorous curriculum with ongoing encouragement and support from teachers and counselors can significantly affect high-ability students of poverty (Burney & Cross, 2006, p. 19).

Career/Technical/Vocational Dual Enrollment Opportunities

The transition from high school to college for students is a critical step that establishes the foundation for a student's educational attainment, career options, preparation, and social mobility (Contreras, 2011, p. 500). Dual enrollment has the potential to shift from traditional programs that focused on small numbers of high-achieving students to a much larger strategy, with the intention of facilitating the high school-to-college transition for a broad range of students (Bailey et al., 2002 p. 28). In a sponsored study by the Bill and Melinda Gates Foundation, The American Institutes for Research (AIR), in partnership with SRI International (SRI), found that the vast majority of students considered academically low-achieving who participated in postsecondary programs and earned a number of collegiate credits while still in high school, in some cases, outperformed similar academic peers in state assessments in math and English (AIR/SRI, 2009). Dual enrollment participation also has been shown to mediate the need for developmental education (Adelman, 2004). The lack of need for developmental education at the collegiate level is an indicator of preparedness when leaving the secondary educational system.

Speroni (2011) conducted a study examining two cohorts of public high school students in Florida that dually participated in dual enrollment and advanced placement courses. It was found that the enrollment of students in both dual enrollment and advanced placement significantly related to the students' likelihood of college enrollment after high school, enrollment in a four-year institution, and attainment of a bachelor's degree (p. 3). Participation in only dual enrollment or advanced placement yielded interesting results. Students engaging in only dual enrollment enrolled in community college at a higher rate than observationally similar advanced placement students and enrolled in four-year institutions at a lower rate. Having only dual enrollment credits was associated with 12% and 7% increases in the rate of community college enrollment and in the rate of four-year college enrollment, respectively, compared to those students not taking dual enrollment or advanced placement courses. Conversely, students who participated in only advanced placement courses were associated with a 6% and 18% increase in the same rates, respectively (Speroni, 2011, p. 33). The Speroni study also acknowledged that four-year colleges may view advanced placement courses with more weight than dual enrollment credits when applying to four-year universities.

Scholars suggest that American K-12 and higher education systems are among the world's least-linked education structures (Boswell, 2000). In particular, the difference between high school graduation standards and college admission requirements has become a concern. In their final years of high school, students typically take state assessment tests. These tests are not linked to college eligibility and there is little to no incentive for students to take them seriously (Boswell, 2000). States have different tests designed to their jurisdiction with little congruity for testing standards among other states. Students are forced to take separate tests such as the ACT or SAT to measure college readiness, apart from the required district and/or state-level testing that is often

required. Advanced placement courses parallel higher educational curriculums and come closest to establishing national standards for postsecondary administrators to use when determining equivalency, transferability, and readiness of student for postsecondary education (Dutkowsky, Evensky, & Edmonds, 2007). College (four-year institutions) preference of student participation in advanced placement courses rather than dual enrollment coursework is most commonly attributed to the national standard curriculum that advanced placement courses deliver. National standard curriculum and mandatory advanced placement training of instructors provide postsecondary institutions with generalizability that is not found in local, regional, or state-based standardized testing and are the greatest contributing factors to this preference of four-year institutions.

Dual enrollment programs in many states have focused on career and technical education programs (CTE) as a means to increase scholastic rigor and engage more students in dual enrollment courses (Cassidy, Keating, & Young, 2010). Through partnerships with local postsecondary institutions, high schools can intensify academic rigor in diverse fields of study, prepare students for continued career and technical education post high school graduation, and provide programmatic offerings without the necessary investment of resources in specialized disciplines (Karp et al., 2007). The integration of vocational/technical programs into K-12 schools, community colleges, universities, and local economic development initiatives is a building block for enhanced local and regional intergovernmental and educational cooperation. One criticism of these efforts is that vocational/technical programs at high schools and area vocational schools too often are poorly integrated with community college and workforce development efforts and, in many cases, have not kept current with the technical requirements of the modern economy. Many traditional vocational courses still are based on the industrial

model using clock hours rather than credit hours, making it difficult or impossible for students who go on to associate or baccalaureate programs to transfer their credits. Similarly, many universities are reluctant to allow articulation of community college associate degrees with applied technical baccalaureate programs, limiting the opportunity for a student who completes an applied associate degree to pursue a four-year degree (Boswell, 2000). As many vocational and technical programs are reflective of local/regional economic needs, greater educational and intergovernmental cooperation can potentially foster local educational and economic growth through the dual enrollment programs tailored to trade and economic demands.

The presence of well-developed vocational courses and labs at community colleges means that dual enrollment can provide such options to students who may not have vocational education in their high school (Bailey et al., 2002, p. 12). This is of importance as many high schools have de-emphasized vocational and skilled trades in favor of less costly academic or college preparatory coursework. In this regard, the community college's traditional role as a provider of technical education makes dual enrollment partnerships with high schools an ideal endeavor—students are able to take vocational courses, high schools can focus on creating curriculums that enable all students to meet high academic standards, and two-year institutions are able to fill their technical classes and create a “pipeline” of future students (Bailey et al., 2002, p. 12). One notable community college campus, the Shreveport-Bossier campus of Louisiana Technical College (LTC), has a number of dual enrollment programs in CTE areas that include graphic communications, computer network specialists, culinary arts, drafting and design technology, carpentry, air conditioning and repair, automotive technology, outdoor power equipment technology, machine tool technology, welding, patient care technician services, and office technology (Reese, 2008, p. 19). Diversity of CTE

programs such as these provides students with outlets to channel their interests and creative abilities while simultaneously engraining them in academic curriculum. Many dual enrollment partnerships base CTE offerings on locally in-demand skilled trades, providing highly skilled college graduates in in-demand fields.

Low-Socioeconomic and Rural Students

There are places where children's futures are stunted by limited and substandard educational opportunities (Nadel & Sagawa, 2002, p. 11). These places are often measured by socioeconomic status, often referred to as SES, a principal indicator of postsecondary academic success. Socioeconomic status, as defined by the American Psychological Association (2013), is commonly conceptualized as the social standing or class of an individual or group. SES is often measured as a combination of education, income, or occupation. Examinations of SES status often reveal inequities in access to resources, plus issues related to privilege, power, and control (American Psychological Association, 2013). There is an alarming disparity in SES in educational attainment, where high-SES students are more likely to attain a college degree than low-SES students. Providing dual enrollment programs to raise the level of educational attainment among low-SES students has been a consistent strategy of educational leaders and national policy makers to fight low levels of attainment among low-SES students (An, 2012, p. 1). Studies have shown that low-SES students may benefit more from dual enrollment coursework than high-SES students (Karp et al., 2007). Rural students lag behind their suburban and urban counterparts in college enrollment and degree attainment largely because of their lower socioeconomic background. When compared with urban and rural samples, rural youth face more serious economic challenges in attending college and earning a degree (Byun et al., 2011, p. 431).

Defining and identifying areas of low-SES populations is critical to targeting educational enrichment opportunities such as dual enrollment programs to students who are otherwise at risk of lesser educational attainment. Although not explicit in the American Psychological Association's definition of SES, race and poverty are most often associated with SES status. From an educational attainment standpoint, race is often used as an identifier in graduation and completion rate statistics. Central to misunderstandings about community college students are other factors that include student patterns of behavior, their aspirations, development, resources, life circumstances, and college experiences, which are largely unexplored by researchers (Levin & Montenegro-Hernandez, 2009). These unique factors are often lobbed into discussion of student SES and its effect on attainment. In a study examining the differences in rural–nonrural postsecondary educational attainment, urban students were approximately 74% more likely than rural students to be enrolled in college (Byun et al., 2011, p. 442). This rural–nonrural difference in college enrollment was largely attributable to rural–nonrural differences in socioeconomic background (Byun et al., 2011, p. 425). Byun et al. found that family structure and church attendance were closely related to college enrollment for rural students. Family income, a two-parent family structure, and the degree to which parents reported knowing the parents of their child's friends were all significant predictors of degree attainment amongst college students (Byun et al., 2011, p. 429). In sum, like college enrollment, rural–nonrural differences in college degree attainment disappeared when socioeconomic background was controlled (Byun et al., 2011, p. 428).

National statistics related to SES each year between 1975 and 2010 reveal the immediate college enrollment rates of high school completers from low- and middle-income families were lower than those of high school completers from high-income

families. Most recently, in 2010, the immediate college enrollment rate of high school completers from low-income families was 52%, 30% lower than the rate of high school completers from high-income families (82%). The immediate college enrollment rate of high school completers from middle-income families (67%) was 15% lower than the rate of their peers from high-income families (U.S. Department of Education, National Center for Education Statistics, 2012). When considering race, Complete College America's (2012) landmark report, *Remediation: Higher Education's Bridge to Nowhere*, found that if a student is African American, Hispanic, or low-income, the student is more likely to need remediation and lack the necessary skills to be successful in postsecondary courses directly from high school. Key statistical findings illustrate that 67.7% of African Americans and 58.3% of Hispanic students need remediation when entering a two-year institution as opposed to 46.8% for white students and 48.9% of students from other races (Complete College America, 2012, p. 6). Of the students requiring immediate remediation upon enrollment in two-year intuitions, over half—64.7%—of students were defined as low income (Complete College America, 2012, p. 6). Equally concerning, only 62% of students complete remediation coursework at two-year colleges; only 23% of students complete remediation and associated college level courses in two years (non-credential attainment); and only 9.5% of students requiring remediation upon entry graduate with an accredited credential within three years of admission (Complete College America, 2012, p. 10).

Borland and Howsen (1999), in their article "A Note on Student Academic Performance: In Urban Versus Rural Areas," noted various researchers' hypotheses attempt to differentiate lower educational attainment of rural students compared with urban students. Contrasting the hypotheses of past researchers, Borland and Howsen concluded that the fundamental issue explaining student educational attainment is not

the rural versus urban areas issue, but the determination of variables within which differences explain the significant variation in student achievement in any area. It is hypothesized that students would be expected to perform similarly, if the associated values of explanatory variables are similar, irrespective of location. In their study of Kentucky urban and rural students, distinct factors that identified unique variables of each category of students were found. For extreme rural students, quality of life variables such as income, employment, education, health care, and housing standards set them apart from other students. Likewise, students in high-density urban areas faced their own unique variables to student success including crime, gangs, deteriorating structures, and urban flight (Borland & Howsen, 1999, p. 539). The researchers found that extreme rural students, when compared with students in high-density urban settings, performed similarly in terms of student achievement. This study, only focusing on Kentucky, forces future researchers to examine whether extreme rural and high-density urban students perform similarly in terms of educational attainment and what unique factors may be exhibited by these students that could impact student success. In the years 1992-2002, rural child poverty has begun to mirror urban poverty. Rural poverty disproportionately affects children of color and children of single parents. Rural poverty has become geographically concentrated in the same way that urban poverty is confined by neighborhoods, and rural children in poverty face the same challenges as poor urban children: substance abuse, teen pregnancy, and educational failure (Nadel & Sagawa, 2002, p. 12). Although rural poverty may become more similar to urban poverty, the reasons behind rural poverty remain significantly different. Isolated rural communities lack the people, skills, and money to support schools, libraries, community centers, child development programs, health clinics, child care centers, and public transportation systems that poor families need to change their lives. Without these essential building

blocks, children born into rural poverty have little chance of breaking free from the cycle of poverty (Nadel & Sagawa, 2002, p. 12).

Rural students are differentiated from their suburban and urban counterparts in many ways. Children who grow up in rural areas tend to be born into families with lower degrees of educational attainment than those in suburban and urban areas. Many come from families with little or no experience in higher education, some of whom have deep reluctance to encourage, or even tolerate, learning beyond the family's place in society ("Rural Students: Common Obstacles, Different Settings," 2006). An *Education Week* article ("Push on to Help Rural Students," 2011) recognizes rural parents' unfamiliarity with postsecondary education as being linked with their own inexperience in higher education. A counselor interviewed for the publication commented,

Parents are never ready, especially if they did not go to college or have that experience themselves. They are not ready for their children to move away to go to college. There is a risk of losing your baby as there aren't a lot of jobs here.

Parents lacking their own postsecondary educational experience inherently want to be near their children and regard postsecondary more suspiciously than members of the new middle class, who anticipate separation of their children as necessary (Howley, 2009, p. 545).

In rural areas hard hit by economic downturns, many jobs have disappeared, sometimes overseas, and sometimes because natural resources have been depleted. Tobacco, lumber, textiles, and manufacturing are often no longer able to support families in rural areas, leading to meager family earnings that leave students unable to afford the rising cost of a postsecondary education ("Rural Students," 2006). Rural students entering postsecondary institutions also face issues of underpreparation due to a lack of instructional resources. At times, rural secondary teachers are less paid and are forced to make do with limited laboratory, technology, and library resources, and little advanced

instructional training. In many of these rural areas, schools struggle to meet academic standard requirements and adequate staffing for instructor specialization. Students of high ability or those who have exhausted the local K-12 system have a smaller number of academic or social peers. Because of the small number of professional staff in rural districts and the small number of students with high learning needs, teachers and administrators are less likely to have the special training required to adequately plan for needed services (Burney & Cross, 2006, p. 17). Through valiant effort, educators in rural schools try and do the best they can under difficult circumstances, yet students generally lack the communication, computation, and other academic skills necessary for collegiate success ("Rural Students," 2006).

Burney and Cross (2006) found in Project Aspire that school climate and policies may inhibit academic advancement. More rigorous courses, such as AP courses, may require too much preparation time for some teachers as well as some students (p. 18). Many rural secondary schools simply cannot afford to offer advanced placement courses. In rural, small school districts where budgets are continually challenging, training and certifying school staff to become certified advanced placement instructors far too often is a cost that is unobtainable. The 2013 cost for AP instructor certification is \$1,600 per certified teacher (College Board, 2013a). This is simply a cost that many rural K-12 school districts cannot afford. Cost of certification and state reimbursement incentives of community college dual enrolled students are two main reasons why many school districts choose dual enrollment offerings rather than advanced placement courses. Limited access to curriculum stifles the ability of already underserved students to experience a college-going culture in high school that academically prepares them for college (Contreras, 2011, p. 509). Underrepresented students are especially likely to be hampered by insufficient access to college preparatory courses, student placement into

remedial-level coursework in college, and a lack of early and high-quality college counseling (Venezia et al., 2003, p. 8). State budget woes have called attention to dual enrollment programs that allow K-12 local education agencies and community colleges to seek attendance credits for students who are enrolled simultaneously (Swanson, 2010, p. 45). Although this may be the case, some small schools may be reluctant to encourage students to attend college early. In Michigan, the school district would not receive the state maximum foundation allowance for students participating in dual enrollment courses. Decisions to forsake traditional high school level coursework in lieu of enhanced dual enrollment programs mean fewer foundation dollars to the rural district, decisions that are often fraught with political liability for local educational leaders. Offering high-quality, intensive learning curriculums can be difficult in rural schools given their small size and remoteness, but those same programs can also be easier to implement, given added flexibility and teacher communication that is possible in smaller schools (Malhoit, 2005, p. 18). A high quality curriculum, essential for future success, can be offered to rural students with only marginally higher costs if the schools have the right tools and leadership to deploy distance-learning and collaborative-learning strategies with nearby educational partners, both at the secondary and postsecondary levels.

The decision to attend college is purely spatial; student enrollment choices are inevitably based to some degree on the spatial distribution of enrollment opportunities relative to their place of high school residence (Cooke & Boyle, 2011, p. 203). When dual enrollment courses are held during the regular school day, access to dual enrollment is broadened as transportation challenges are reduced and conflicts with after-school obligations are eliminated (Hughes et al., 2012, p. 6). Likewise, offering courses on the college campus can close access to students without adequate means

for transportation. Offering dual enrollment courses on the high school campus is an alternative for districts where logistical challenges affect a large population of students. Although some question the “authenticity” of delivering college courses on the high school campus, Hughes et al. (2012) revealed, through surveys and focus group students, that dual enrollment courses located at the high school had the potential to be just as beneficial as those offered at the college, and that the high school location did not negatively influence the degree to which they were building confidence about their ability to succeed in college (Hughes et al., 2012, p. 6). When transportation can be arranged, students in courses on the college campus are likely to have a fuller and more authentic experience (Hughes et al., 2012, p. 6). Distance and transportation of rural students to postsecondary institutions have always been impediments in rural students’ educational attainment. In an article in the *Chronicle of Higher Education*, Mark Hamilton, president of the University of Alaska system, describes transportation difficulties in that state:

In Alaska “rural” does not mean a picturesque countryside with farms and towns linked by networks of secondary roads. It means tiny villages connected by twin-engine planes to regional hubs, and thereafter by jet to larger cities in Alaska and beyond. About 70 percent of Alaska’s residents live on 5 percent of its geographic area, and the rest live in hundreds of rural towns and villages spread out over more than 626,000 square miles. The University of Alaska provides rural education through a system that includes three urban universities, 12 community colleges located in rural hub locations, and extensive distance-education offerings. (“Rural Students,” 2006 m.p.)

Alaska is not alone in facing distance as a challenge to reach rural students for postsecondary education. John Salois, president of Montana’s Blackfeet Community College, commented in the same article:

Students face a huge obstacle just trying to get to class. About half of the college’s students live more than five miles away, with a large number living as far as 40 miles away. For those who can afford to purchase a car, the cost of operation and maintenance is often overwhelming. With fuel prices often on the rise, a student who drives 30 miles one way can pay up to \$150 per month in gas bills alone. (“Rural Students,” 2006)

Examples of travel distance in Alaska and Montana may seem a bit extreme, yet considering the composition of a modern community college student, distance can be a highly prohibitive factor in collegiate attainment. Rural schools are frequently defined by isolation, long distances between places, and their sparse populations. In general, states with a high percentage of rural schools are those where sparse populations and/or challenging terrain make it difficult to transport students to consolidated regional schools in nonrural areas (Strange et al., 2012, p. 5). These characteristics affect the cost of transportation, which can be especially difficult for rural families with low-SES levels (Nadel & Sagawa, 2002, p. 12). Examining the effects of family structure and residence location on parental participation in school-related activities in rural communities, Sun, Hobbs, Elder, and Sun (1997) observed that parents from dual parent households and parents who have lived within the local school district for long periods of time tend to participate in school-related activities. They also discovered that parents who live in rural areas tend to participate more in school-related activities than those in suburban or metropolitan areas. SES exerts the greatest impact on parental involvement in rural schools compared with other types of suburban or urban settings (Sun et al., 1997). A safe and reliable school transportation program is an essential component of an adequate educational system. In rural communities, school transportation should take on an even greater level of importance than in other schools. Schools buses should be maintained, safe and sufficient to transport all students (Malhoit, 2005, p. 20). Rural bus routes should be as short as possible and capable of transporting many students, from the earliest primary learners to the dual enrollment students taking college courses on distant campuses. Across rural areas, road conditions and weather affect transportation times to and from educational institutions. Examining the difficulties of transportation across rural areas, Spence (2000) interviewed current and past students of rural West

Virginia regarding their experiences. One interviewee remarked, "The weather can be beautiful; we can get halfway to school and [hit] a blinding snowstorm and slick roads" (p. 6). Across the harsh landscape, students forced to travel long distances to attend school have had to become active participants in their transportation journey. "One of the things I learned was not how to read and write, but how to put chains on the back of the bus. That's the first class you get. You help the bus driver" (Spence, 2000, p. 3). A long daily commute, up to two hours each way, takes its toll on students.

Today's community college students do not fit the model of 18- to 19-year-old recent high school graduates who attend four-year institutions directly out of high school. Instead, the average community college student today is likely attending college only part-time and is, on average, 28 years old (U.S. Department of Education, 2009). Today's community college students are likely to the first generation of their family to attend college and receive financial aid to attend. Other significant demographic qualities are the segment of students who are single parents (13%) or students with a disability (12%) (U.S. Department of Education, 2009). Community college students are typically women (57%), who are attending community college at a significantly higher rate than their male (43%) counterparts (U.S. Department of Education, 2009). Community college students are increasingly required to balance employment and education simultaneously. Fifty-nine percent of all full-time students are employed at least part-time, and 21% of full-time students are employed full-time (U.S. Department of Education, 2009). Balancing the demands of employment and postsecondary education is increasingly difficult, as evidenced by the ratio of enrolled part-time students (58%) to full-time students (42%) (U.S. Department of Education, 2009).

The transition from high school to college is an unsuccessful one for many, and a variety of causes can contribute to this: students' uncertainty as to how to apply or pay

for college, academic unpreparedness for college-level coursework, or work-life balance issues affecting engagement and persistence in a dedicated program of study (Bailey et al., 2002). Students from poverty who have no family members experienced with higher education require exceptional levels of support in order to successfully graduate from college (Burney & Cross, 2006, p. 18). For low-SES students (for whom bachelor's degree completion is problematic), a strengthened high school curriculum and improved quality of the learning environment have great potential for increasing the probability of completing a college degree (Adelman, 2006). The impact of a high school curriculum of high academic intensity and quality on degree completion is far more pronounced—and positively—for African-American and Latino students than any other pre-college indicator of academic resources. The impact for African-American and Latino students is also much greater than it is for white students (Adelman, 1999, pp. 84-86). Dual enrollment programs are rarely perceived as intervention programs, yet they represent a programmatic opportunity to increase access to college for students of color, particularly among high achievers. Several states, including Michigan, promote dual enrollment course-taking while in high school, which serves as a viable option for disadvantaged students of all natures to reduce the overall cost of college while enhancing their preparation for continued college enrollment (Contreras, 2011). It is vital that schools provide advanced educational options in grades K-12 because these are likely the only opportunities for gifted students from poverty to develop their talents (Burney & Cross, 2006, p. 14).

A strong bond exists among rural community members that fosters a firm commitment to protect and support families. With their sparse populations, low crime rates, beautiful open space, and sense of community, many rural places offer a welcome break from the problems associated with urban and suburban living (Malhoit, 2005,

p. 10). Lack of research on rural America, and particularly rural education systems, cloaks reality with a level of intellectual invisibility on the peculiarities of rural families, rural ways of living and working, and local rural meanings and knowledge (Howley, 1997). Sadly, rural schools with the combination of high populations of poverty and little racial or ethnic diversity have not been studied in depth (Burney & Cross, 2006, p. 16). Like the traditional American farmer, the rural education researcher appears to be something of an “endangered species” (Sherwood, 2000, p. 159). Rural students with academic promise living in poverty are members of a special population that has received little attention in the literature and in their environments (Burney & Cross, 2006, p. 20). When attention is paid to “rural,” it is often more for the sake of a representative sample than for learning something more substantive about rural schools. Many education researchers are unable to shed or even recognize their own urban biases, and too often assess rural communities in terms of inadequacy, as opposed to their assets (Sherwood, 2000, p. 159). Shortcomings in research on rural areas make it difficult to document a case for the situation of rural children and their education. Lack of standard statistical definition of what “rural” means is one of the primary challenges. Another mitigating factor of rural research is the lack of dialogue nationally about rural students and the great majority of students they represent.

Conclusion

Michigan’s system of dual enrollment allows students to participate in up to 10 collegiate courses during their high school years. State deductions from the local K-12 foundation allowance allow most, if not all, students participating in dual enrollment to earn college credits at little or no cost. Dual enrollment has been identified as a strategic linkage not only to assess and prepare students for the realities of collegiate academic expectations, but to provide an opportunity to foster partnerships between K-12 districts

and postsecondary institutions. Students who participate in dual enrollment enjoy a host of favorable outcomes, such as a higher likelihood to graduate from high school and enroll in college, more pronounced levels of college success and completion, and easier transition into the “real-world” collegiate academic and social experience, to name a few. Dual enrollment also serves as a mechanism to provide costly and specialized career and technical education programs to students whose high schools cannot afford to offer such programs. Simultaneously, career and technical education programs are a potential gateway to engage students who are not pursuing a traditional scholastic path of university study. Students of low-SES and rural backgrounds face numerous challenges in postsecondary achievement. Dual enrollment is an opportunity to engage and influence at-risk populations and guide their educational careers toward the demonstrated benefits and positive outcomes associated with low-SES and rural student participation.

CHAPTER 3

METHODOLOGY

Introduction

The methodology begins with defining the research approach and rationale. Supporting databases and documents are introduced and their inclusion in database development is detailed. The classification system used to define urbanity and rurality is explained. Research questions are posted and a hypothesis is provided. Study participants, design, and Institutional Review Board approval is presented in conjunction with numerous supporting documents. Measurement techniques are detailed as are threats to validity and generalizability. The procedures in which the researcher cleansed and analyzed data are explored. Finally, descriptive and statistical analyses measures are introduced in attempting to address the research questions and hypothesis.

Approach

A quantitative approach was selected by the researcher to examine descriptive statistics of dual enrolment participation rates and patterns, along with significance and influence relationship analyses of distance in miles of roadway between community college and high school campuses in Michigan. CEPI data from the 2011-11 K-12 scholastic year provided dual enrollment participation rates for Michigan high school students (State of Michigan Center for Educational Performance and Information) from the 2010-11 K-12 scholastic year (State of Michigan, 2011). Michigan LEA, ISD, and PSA K-12 districts are distributed with much greater density across the state of Michigan than community college districts due to the LEA, ISD, and PSA K-12 nature and volume,

yet similarly encompass urban and rural areas, representing high and low levels of urbanity and rurality.

CEPI data revealed 846 LEA, ISD, and PSA public school buildings with students eligible to participate in dual enrollment courses in either the 11th or 12th grade during the time period of observation. In addition to dual enrollment eligible and participating students, CEPI data provide a wealth of information on specific K-12 entities and dual enrollment characteristics of their students, including the K-12 entity's building name (e.g., Ionia High School), educational entity building type (e.g., LEA or ISD or PSA), district name of the local educational entity (e.g., Ionia Public Schools), Intermediate School District name in which the local educational entity is located (e.g., Ionia ISD), the county in which the educational entity is located (e.g., Ionia), the total amount of tuition paid by the K-12 district for dual enrollment courses enrolled, the number of students in grade 11 that were eligible to dual enroll, the number of grade 11 students that participated in dual enrollment course(s), the number of students in grade 12 that were eligible to dual enroll, the number of grade 12 students that participated in dual enrollment course(s), the number of postsecondary credits that the respective 11th and 12th grade students from each K-12 educational entity attempted, the number of postsecondary credits that the respective 11th and 12th grade students from each K-12 educational entity earned, the number of high school credits that the respective 11th and 12th grade students from each K-12 educational entity earned, and the cumulative number of courses not completed by each cohort of 11th and 12th grade students (State of Michigan, 2011).

Data contained in the CEPI dataset were collected by the State of Michigan via each public K-12 educational entity through the Michigan Education Information System. Operating out of the State of Michigan Budget Office, CEPI collects and reports data

about Michigan's K-12 public schools. CEPI initiatives in data collection and reporting facilitate school districts' compliance with the federal No Child Left Behind Act of 2001 and the Michigan Department of Education's accreditation plan, Education Yes! As state and federal law requires Michigan's K-12 public schools to collect and submit data about students, educational personnel, and individual schools, CEPI data are used to determine state aid payments, adequate yearly progress, accreditation, graduation/dropout rates, teacher qualifications, what constitutes a "safe" school, and many other state and local metrics (State of Michigan, 2013).

Defining what is classified as urban and rural varies depending on the state or federal agency or researcher. In researching the urban versus rural classification methods, or as the researcher believes, classification phenomenon, no singular method of classification was universally applicable, with the exception of the U.S. Bureau of the Census and NCES. NCES UCLC definitions identify whether a local school district is a city, suburb, town, or rural (based on 2005-2006 classifications). National educational statistics are classified using this system of identifying urban and rural locations, and for the purposes of maintaining a level of consistency with other research on this topic, the zip codes of Michigan K-12 LEA, ISD, or PSA buildings with dual enrollment participants were paired with the NCES districts' locale code as determined by the locale category (city, suburb, town, and rural) by population.

The NCES defines a census-designated place as an unincorporated community (i.e., without legal boundaries) for which locale officials provide boundaries for the purpose of census tabulations. CMSA is an area that meets the requirement to qualify as a Metropolitan Statistical Area (MSA) and that has a population of 1,000,000 or more, and the components of which are large urbanized counties or a cluster of such counties (cities and towns in New England) that have substantial commuting interchange

(National Center for Education Statistics, 2013). The NCES classification MSA is defined as one or more contiguous counties that have a core area with a large population nucleus and adjacent communities that are highly integrated by economics or socially with the core (National Center for Education Statistics, 2013). A principal city is defined as a primary population and economic center of an MSA (National Center for Education Statistics, 2013). Urbanized areas and clusters are densely settled cores of census blocks with adjacent densely settled surrounding areas. When the core contains a population of 50,000 or more, it is designated as an *urbanized area*. Core areas with populations between 25,000 and 50,000 are classified as *urban clusters* (National Center for Education Statistics, 2013).

The inclusion of NCES school location classification codes mated to zip codes of Michigan K-12 LEA, ISD, or PSA buildings allowed the researcher to demonstrate through descriptive and quantitative statistical analyses precisely where dual enrollment occurs, to what extent, and the significance and influence of miles of roadway coupled with urban and rural locations on dual enrollment participation of high school students in Michigan.

Research Question and Hypothesis

Community college and local K-12 educational entity campus location coupled with data provided by CEPI, primarily the number of dual enrollment eligible students who participated in one or more dual enrollment courses while simultaneously enrolled in their respective K-12 LEA, ISD, or PSA district member, serves as the basis for quantitative analysis. Broadly, the researcher sought to understand where students participate in dual enrollment at higher tendencies and where they do not in regard to urbanity or rurality. Specifically, *at what rate (percentage) do eligible 12th grade students participate in dual enrollment relative to NCES UCLC classifications in Michigan?*

Descriptive statistics assisted the researcher in demonstrating if a phenomenon exists relative to the relationship between participation and geographic location. The research question asks, *What is the significance and influence of distance in miles of roadway between high school and community college campus on dual enrollment participation in Michigan?*

The hypothesis is: *There is a difference in the percentage of dual enrollment eligible students who dual enroll in urban versus rural areas in Michigan.*

These questions and hypothesis allowed the researcher to determine statistical significance of the phenomenon and influence of the independent variable on the dependent variable.

Participants

Dual enrollment eligible high school students from Michigan K-12 public educational entities represent the participants for quantitative analyses. Operationally, every Michigan community college campus location (building in which academic courses may be offered) and every Michigan K-12 LEA, ISD, and PSA campus location (building in which academic courses may be offered) with dual enrollment eligible students are the source of the participants. Michigan is comprised of 28 community colleges, each with its own taxing district. The Michigan Community College Districts map found in Appendix A illustrates the distribution and size of these districts. Dispersed widely across the state, Michigan community colleges encompass urban and rural areas, representing high and low levels of urbanity and rurality. Likewise, the 846 LEA, ISD, and PSA school districts housed in the CEPI dataset are dispersed widely, with much greater density across the state, encompassing urban and rural areas and representing much higher and lower levels of urbanity and rurality due to their location and nature. Appendix B (the K-12 district map) illustrates the distribution and location of these districts. The Ferris State

University Institutional Review Board granted an exemption from full committee review with approval to conduct the study on November 8, 2013 (#131011), which is found in Appendix C

In this study, which was constructed to be a statewide study examining student participation in dual enrollment relative to geographic area and the influence of distance between campuses on high school/community dual enrollment participation, every community college district (28) and all LEA or ISD or PSA local educational entities (846) were included in an all-inclusive sample for statistical analyses. This sheer sample size is more than sufficient for the purposes of a content analysis of the state of Michigan. Conclusions of this study cannot be generalized to other states or the nation. The statewide nature of this sample selection is intended to illustrate any disparities in urban/rural dual enrollment participation in the state of Michigan and serve as a “call to action” for local K-12 educational entity and community college leaders to refocus and refine dual enrollment educational programs. Perhaps the statewide nature of these data will provide a “before” snapshot of dual enrollment participation, which may then be used in contrast with future “after” policy analyses, such as legislative changes to dual enrollment participation eligibility criteria.

Data missing or otherwise not available to the researcher at the time of the study were excluded from quantitative analyses. A detailed explanation of excluded data can be found in the procedures section.

Measurement

CEPI data providing the number of dual enrollment eligible and participant students used in conducting this study are a product of state-level data used in the assessment of academic progress and state aid payments, which encompass all entities as a fully inclusive sample; these data represent the highest level of data reliability

available to the researcher. This reliability, however, is not without limitations in regard to internal and external validity. Internal validity, as it pertains to the accuracy and relevance related to the research component of high school dual enrollment participation, as compiled in the CEPI dataset, is extremely robust. The question of how many 12th grade students were eligible for dual enrollment and how many of these students actually participated in dual enrollment can directly be answered via CEPI data, providing the researcher with a reliable dataset of high internal validity. As CEPI data are representative of a singular, statewide dataset, the results from any qualitative or quantitative analyses cannot be generalized with a high level of external validity beyond the subjects studied.

Data gathered by the researcher on Michigan community college district campus locations began with identifying all non-tribal community colleges in the state of Michigan, as found in Appendix A. Once identified, a web search of every community college was performed with the specific intent of identifying all community college campuses within each district and the physical address of these locations. Addresses of campus locations were drawn from the websites of the community college districts examined. At the time, all campus or satellite community college campus address locations were identified, and the county in which each campus is located was identified. Finally, the community college districts' boundaries, as defined by their websites, were added to complete this portion of data gathered by the researcher.

Collecting campus location data via the Internet is not without reliability concerns. As a way to reduce the inherent threats to reliability that can result from Internet research, campus location information was collected only from websites that were published and maintained by community colleges themselves. The greatest potential threat to internal validity is borne purely through the timing of the research itself. As

noted, the CEPI dataset is representative of the K-12 academic year 2010-11. Research on community college campus locations was conducted in 2012-13. It is possible that community college and K-12 campus locations were established, erected, or eliminated between the times represented in the CEPI dataset and the time when community college campus location data were collected by the researcher.

LEA, ISD, and PSA K-12 data collected by the researcher were based on the same techniques in the aforementioned community college campus location research. Using the Internet, the researcher searched the building name for every LEA, ISD, and PSA K-12 educational entity that had dual enrollment eligible students, in search of a physical building address. Like community college campus locations and building addresses, K-12 campus location and physical building addresses, with researcher deemed reliable data published by the local LEA, ISD, or PSA website, were collected.

Once the LEA, ISD, or PSA building address was identified, the location of this building was triangulated with community college district boundaries to classify whether the building was located within or outside of a community college taxing boundary. Once determined, the community college taxing boundary near where the building resided was identified, or if the building was not located within a community college taxing boundary, the nearest community college district was identified. Having identified the physical address of the LEA, ISD, or PSA building, these data were paired with previously collected data on community college campus locations and addresses to measure the distance in miles between nearest buildings. Using Google Maps, the researcher input the address of the LEA, ISD, or PSA building along with the nearest community college district and campus locations, providing a unique quantitative variable: the number of miles between the K-12 LEA, ISD, or PSA building with dual enrollment eligible students to the nearest in or out of taxing district community college campus, utilizing the shortest

distance in miles of roadway. Identifying the distance in miles between nearest campuses, the researcher paired this quantitative value with quantitative values reflected by dual enrollment participation in an effort to determine significance and influence of the variables of mileage between campuses and dual enrollment participation.

Efforts to ensure the reliability of community college campus locations and K-12 LEA, ISD, or PSA buildings centered on the gathering of data through institutionally published and maintained websites. Locations of buildings that could not be reliably identified through an institutionally published and maintained website were excluded from the dataset. Internal validity is compromised largely through the timing of the research itself. The gap in time (2+ years) between when the CEPI data were gathered and when the researcher determined the building addresses of community college and K-12 campus locations poses a threat to internal validity. It is possible that community college and K-12 campus locations have changed during this period, potentially compromising the distance between miles of roadway that students/faculty/staff may have experienced if traveling between campuses during this time. A statewide, all-inclusive dataset is not representative of other states or national dual enrollment participation and distance data. No effort was made to control for external validity as the scope and nature of the study is not intended to draw inferences regarding other institutions, agencies, and states outside of Michigan. As always, researcher error, which could result from hundreds of data points to triangulate within community college districts and to calculate distance in miles, poses a threat to the reliability of the data.

Procedures

Archival CEPI data from the 2010-11 K-12 academic year formed the basis of the database construct. Multiple additional variables were added to the CEPI database. These variables included NCES school classification codes based on the K-12 district's

zip code, in/out of community college district status as determined by the K-12 district's location relative to Michigan's community college districts, the nearest community college campus (in district campuses being selected regardless of distance), the address of the nearest community college campus, and the distance in miles between the nearest community college campus and the K-12 building. Grade 12 eligible students and Grade 12 eligible participants in the CEPI database were transformed into an average school participation rate by dividing the Grade 12 eligible participants by the Grade 12 eligible students to determine an overall percentage of raw participation for each K-12 district building. This transformed variable was labeled "mean 12th grade participation." K-12 building locations and NCES Urban-Centric Locale Codes definitions that were unavailable through web searches of local school district websites were cross referenced through the NCES Search for Public School Districts Common Core of Data. Building addresses that were unable to be found were excluded.

A total of 20 K-12 schools were excluded from the study for two reasons: the school address was unavailable due to closure or non-reporting, or the distance in miles between campuses was not able to be calculated because of geographic features, such as one campus being located on an island and the other on the continental landmass. These schools included Cadillac Schools Adult Education, Calhoun Area Career Center, Choices Alternative Education, Dearborn Magnet High School, Detroit Midtown Academy, Detroit Transition Center East, Kalamazoo Adult High School, Muskegon Area Career Tech Center, Barsamian Preparatory Center, Trombly Alternative High School, Craig El, Mackinac Island School, Hillsdale ISD Local Programs, Hillsdale Workforce Development/Tech Center, Wexford-Missaukee ISD Career Center, Beaver Island Community School, Beaver Island Lighthouse Program, Delta-Schoolcraft Area Center,

and Reed City Alternative Education Program. Keweenaw County was also excluded as it was not included in the CEPI dataset.

The use of descriptive statistics in addressing the hypothesis—*There is a difference in the percentage of dual enrollment eligible students who dual enroll in urban versus rural areas in Michigan*—and the research questions—*At what rate (percentage) do eligible 12th grade students participate in dual enrollment relative to NCES UCLC classifications in Michigan?* and *What is the significance and influence of distance in miles of roadway between high school and community college campus on dual enrollment participation in Michigan?*—allowed the researcher to demonstrate dual enrollment trends coupled with statewide NCES school classifications. The independent variable, distance in miles (rounded to the whole mile) between high school and community college campuses, represents the range in miles students travel between campuses in each NCES school classification. The dependent variable, mean 12th grade participation (rounded to the nearest whole integer), is the average of student participation rate of dual enrollment eligible students in each high school. Descriptive statistics provide comparisons of NCES classification, mileage between high schools and community college campuses, range in miles between high schools and community college campuses, mean dual enrollment student participation of all K-12 buildings in each NCES classification, percentage of K-12 building in a community college service district, and percentage of K-12 building out of a community college service district.

Using descriptive statistics is also the most effective technique to demonstrate the highest overall percentage of mean dual enrollment participation by Michigan counties. Each county in the state of Michigan is listed with the County-Wide Mean Dual Enrollment Student Participation. The County-Wide Mean Dual Enrollment Student Participation variable was developed by averaging the mean dual enrollment student

participation rates of all K-12 buildings and districts within the county subdivision. Likewise, the variable County-Wide Mean Miles From HS to CC Campus was developed by averaging the means of mileage from high school to community college campuses for every K-12 building and districts within the county subdivision. The Mode NCES County Classification represents the most common NCES K-12 building Urban-Centric Locale Code definition per county. Presenting these transformed variables, which represent countywide means of the overall percentage of raw participation and mileage for each K-12 building for every county in Michigan, in conjunction with the mode NCES classification for all K-12 buildings, provides robust descriptive analyses of area and propensity of dual enrollment participation strength and weakness in the state.

Significance and influence testing of the independent and dependent variables provided the researcher with a measure of significance of variable relationship based on $p < 0.05$. An independent samples t test provided the researcher a measure of relationship significance in determining the existence of a scientifically significant relationship between the variables. Measurement of influence of one variable on the other was calculated by Cohen's d , providing the researcher with a measure of the effect-size r , which provided a measure of influence of one variable to the other, effectively informing how much a change on one variable is caused by the other. Demonstrating whether scientific significance exists and asserting the influence of the independent variable on the dependent variable were statistically analyzed to confirm the findings presented through descriptive statistical analyses.

Conclusion

A quantitative research approach was employed by the researcher to interpret descriptive statistics and determine whether a significant and/or influential relationship exists between the numeric variables: mean K-12 building dual enrollment participation

rate of 12th grade students and distance in miles of roadway between each K-12 building and the nearest community college campus using the shortest route. Controls for internal validity are accounted for and lack of external validity is described. The NCES classification system is a standardized nationwide system developed by the U.S. Department of Education to classify K-12 public school districts based on their urban, suburban, town, and rural orientation. The NCES classification system was applied to every Michigan LEA, ISD, and PSA building identified via CEPI, providing the researcher with a classification of all Michigan public K-12 schools. This locale classification then was paired with the each building's 12th grade dual enrollment participation rate, and other significant variables through descriptive statistics. Statistical significance and influence were tested utilizing independent samples *t* test, Cohen's *d*, and the effect-size *r*.

CHAPTER 4

FINDINGS

Introduction

The Findings chapter opens with descriptive statistics that reveal differences in dual enrollment participation rates of students in NCES UCLC locales. Significance and influence analyses are described and illustrated via multiple figures and tables.

Descriptive Statistic Analysis

Table 1 provides descriptive statistics which reveal that a difference in dual enrollment participation does exist among students in cities, suburbs, towns, and rural areas. The greatest percentage of eligible students participating in dual enrollment are those classified as living in remote rural locales, the mean participation rate being 24%. Nearly all live outside of a community college service district. There is an average of 33 miles between the high school and nearest community college building. The least percentage of eligible students participating in dual enrollment are those classified as living in large cities, the mean participation rate being 3%. All live within a community college service district, and there is an average of 3 miles between the high school and nearest community college building. Figure 1 illustrates that statewide 525 out of 820 high schools in the study were located in a community college service district, or 64% of all high schools. Of the high schools in the study, 295 out of 820 were located outside of a community college district, or 36% of all high schools. Figure 2 illustrates high schools located in/out of community college service districts as well as community college campus locations.

Table 1

Descriptive Statistics

NCES K-12 Building Classification	Mean Distance Between HS & CC Campuses (Miles)	Campus Distance Range (Miles)	Mean Dual Enrollment Student Participation	Percentage In a Community College District	Percentage Out of a Community College District
City, Large	3	1 to 8	3%	100%	0%
City, Midsize	4	1 to 9	20%	100%	0%
City, Small	3	0 to 10	22%	83%	18%
Suburb, Large	6	1 to 18	11%	94%	6%
Suburb, Midsize	6	0 to 19	14%	89%	11%
Suburb, Small	6	0 to 21	10%	86%	14%
Town, Fringe	15	1 to 56	15%	53%	47%
Town, Distant	26	3 to 29	17%	36%	64%
Town, Remote	26	0 to 119	14%	17%	83%
Rural, Fringe	20	0 to 126	20%	56%	44%
Rural, Distant	14	0 to 110	16%	45%	65%
Rural, Remote	33	3 to 102	24%	10%	90%
Cities (Avg.)	3	0 to 10	15%	94%	6%
Suburbs (Avg.)	6	0 to 21	12%	90%	10%
Towns (Avg.)	22	0 to 119	15%	35%	65%
Rural (Avg.)	22	0 to 126	20%	37%	66%

The statewide average of the distance in miles between high schools in community college service districts to the nearest community college campus is 8 miles (rounded to the nearest whole number). The statewide average of the distance in miles between high schools outside of community college service districts and the nearest community college campus is 25 miles (rounded to the nearest whole number) as shown in Figure 3. Figure 4 demonstrates the dual enrollment participation rate for high schools in community college service districts was 16%. Likewise, the dual enrollment participation rate for high schools out of community college service districts was 16%. These descriptive statistics reveal that high schools located within community college serve districts dual enroll the same number of eligible high school dual enrollment participants as students who live outside of a community college district.

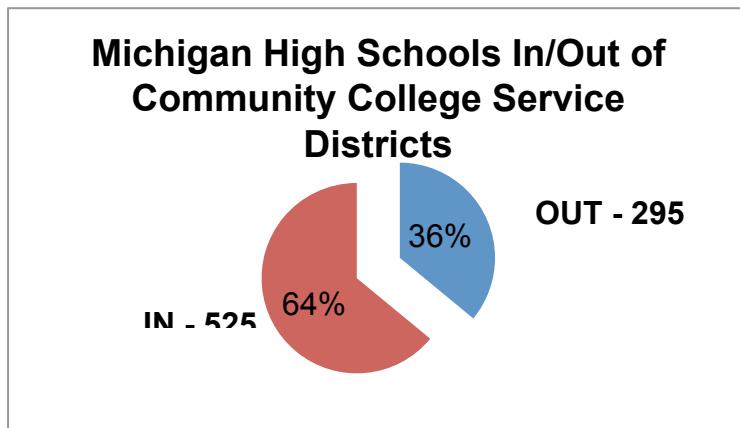
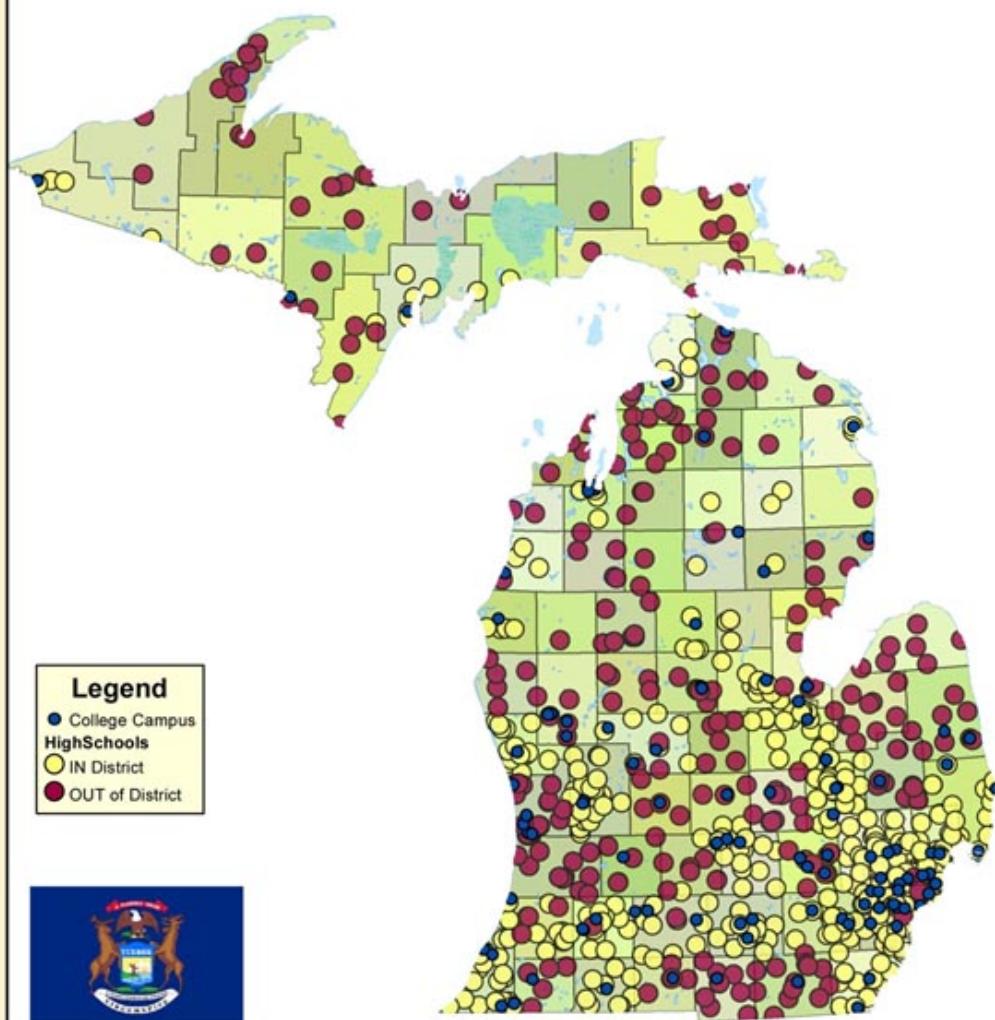


Figure 1. Michigan High Schools In/Out of Community College Service Districts

Michigan High School IN/OUT of Community College District



All data provided/compiled by Sean Adams
Map Published on June 12, 2014

0 12.5 25 50 75 100 Miles

Figure 2. Michigan High School In/Out of Community College District

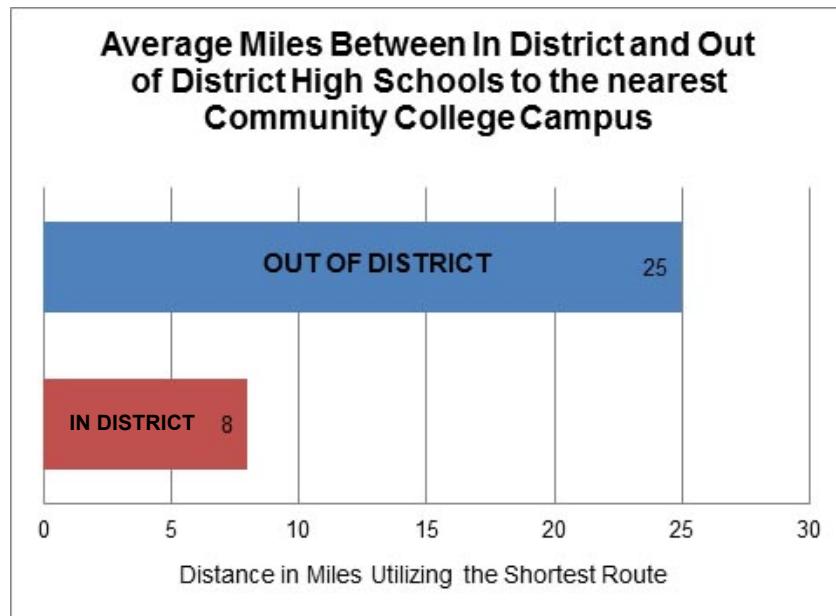


Figure 3. Average Miles Between In District and Out of District High Schools to the Nearest Community College Campus

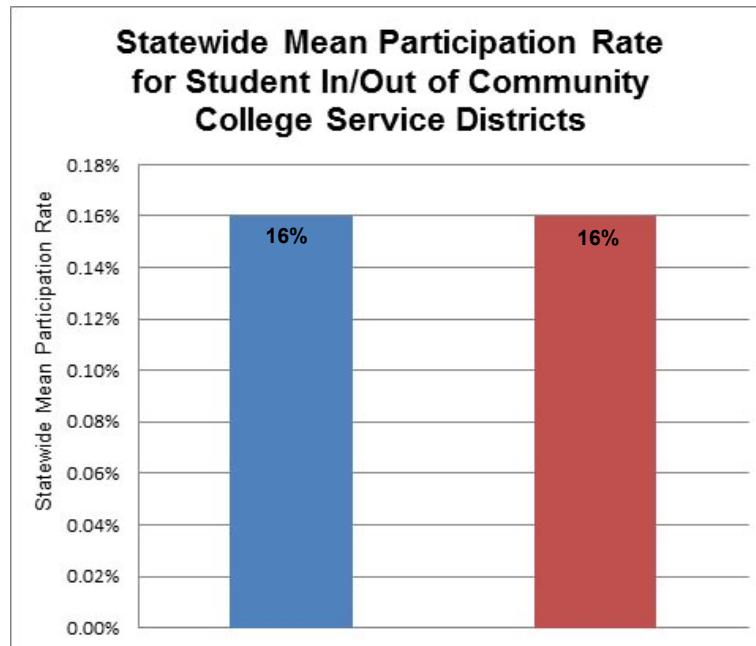


Figure 4. Statewide Mean Participation Rate for Student In/Out of Community College Service Districts

Michigan county by county descriptive statistics reinforce the finding that many rural dual enrollment eligible dual enrollment students participate in collegiate courses at a much greater overall frequency than their urban and suburban counterparts. The top 10 counties with the highest overall countywide mean dual enrollment student participation most commonly were classified as rural remote, as identified by the NCES countywide classification mode of all high school classifications located within each county (see Table 2). Common across the state, students living in rural counties participate with the greatest overall frequency compared to their urban and suburban counterparts. The distributional map of Michigan counties representing the NCES county classification mode and the countywide mean dual enrollment student participation effectively demonstrate urban and rural dual enrollment participation patterns, as shown in Figure 5. Figure 6 illustrates the countywide average miles from local high schools to the nearest community college campus.

Descriptive statistics revealed that of the 93,734 dual enrollment eligible students statewide, only 9,538 students dual enrolled in a collegiate course, 10% of the eligible student body. A total of 90,743 students attended high school in LEA school district buildings, representing 8,794 dual enrollment participants, a 1:10.319 ratio of eligible LEA student dual enrollment participation. A total of 2,083 students attended high school in PSA school district buildings, representing 406 dual enrollment participants, a 1:5.13 ratio of eligible PSA student dual enrollment participation. Finally, 908 students attended high school in ISD school district buildings, representing 338 dual enrollment participants, a 1:2.69 ratio of eligible ISD student dual enrollment participation (see Table 3).

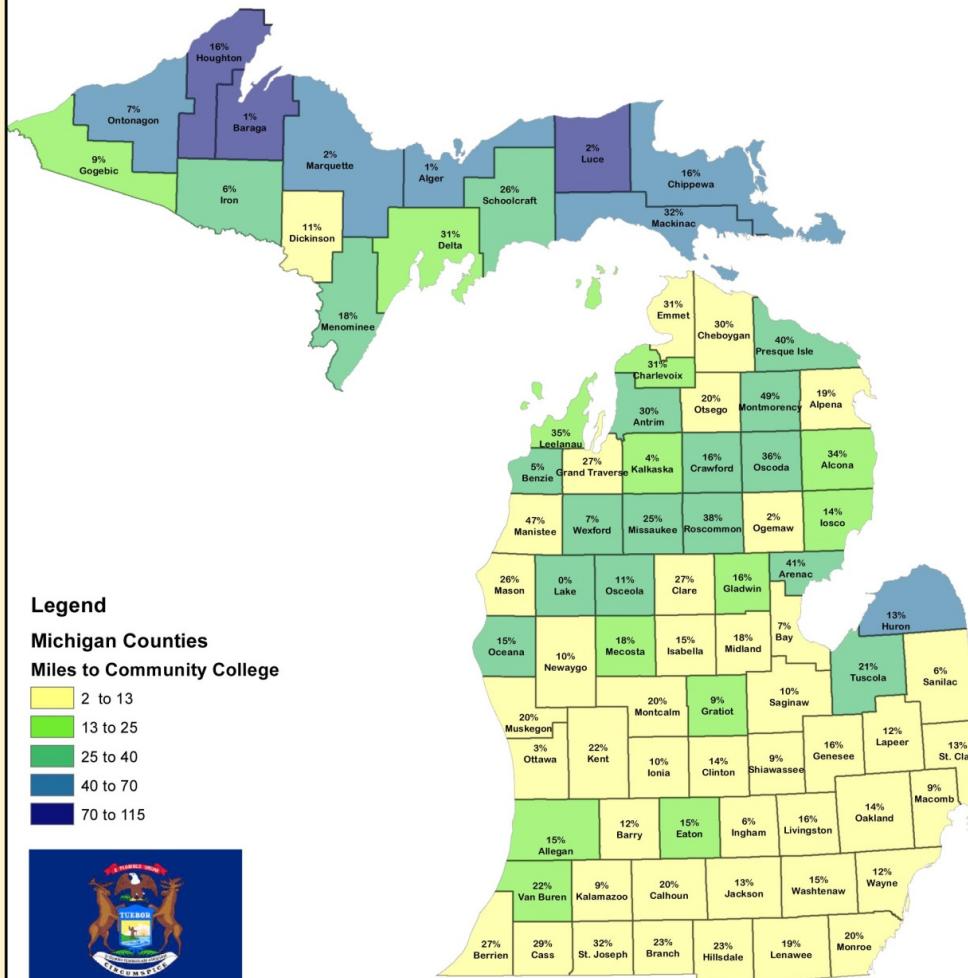
Table 2

State of Michigan Mean Dual Enrollment Participation Rates and Mean Distance in Miles Between High School and Community College Campuses by County

County	Countywide Mean Dual Enrollment Student Participation	Countywide Mean Distance Between HS & CC Campuses (Miles)	Mode NCES County Classification (of all county high schools)
Montmorency	49%	33	Rural, Remote
Manistee	47%	9	Town, Remote Rural, Remote (<i>tie</i>)
Arenac	40%	29	Rural, Remote
Presque Isle	40%	32	Rural, Remote
Roscommon	38%	18	Town, Remote
Oscoda	36%	28	Rural, Remote
Leelanau	35%	23	Rural, Remote
Alcona	34%	21	Rural, Distant
Branch	33%	8	Town, Distant Rural, Distant (<i>tie</i>)
Mackinac	32%	49	Rural, Remote
St. Joseph	32%	12	Rural, Distant
Charlevoix	31%	18	Rural, Distant
Delta	31%	16	Town, Remote Rural, Distant Rural, Remote (<i>tie</i>)
Emmet	31%	10	Rural, Distant Rural, Remote (<i>tie</i>)
Antrim	30%	26	Rural, Remote
Cheboygan	30%	12	Rural Fringe, Rural Remote (<i>tie</i>)
Cass	29%	10	Rural, Distant
Clare	27%	9	Town, Remote Rural, Fringe (<i>tie</i>)
Grand Traverse	27%	3	Rural, Fringe Rural, Remote (<i>tie</i>)
Mason	26%	8	Rural, Distant
Schoolcraft	26%	35	Town, Remote
Missaukee	25%	41	Rural, Remote
Berrien	24%	9	Town, Fringe
Hillsdale	23%	10	Rural, Distant
Kent	22%	9	Suburb, Large
Van Buren	22%	15	Rural, Distant
Tuscola	21%	28	Rural, Distant
Calhoun	20%	8	Rural Fringe, Rural, Distant (<i>tie</i>)
Monroe	20%	10	Rural, Fringe
Montcalm	20%	9	Rural, Remote
Muskegon	20%	8	Suburb, Midsize
Otsego	20%	7	Rural, Fringe Rural, Distant Rural, Remote (<i>tie</i>)
Alpena	19%	2	Town, Remote
Lenawee	18%	12	Rural, Distant
Mecosta	18%	22	Rural, Fringe Rural, Remote (<i>tie</i>)
Midland	18%	8	Rural, Fringe
Menominee	17%	33	Rural, Remote
Chippewa	16%	70	Town, Remote

Crawford	16%	27	Rural Fringe, Rural, Distant (<i>tie</i>)
County	Countywide Mean Dual Enrollment Student Participation	Countywide Mean Distance Between HS & CC Campuses (Miles)	Mode NCES County Classification (of all county high schools)
Genesee	16%	7	Suburb, Large
Gladwin	16%	17	Rural, Fringe Rural, Distant Rural, Remote (<i>tie</i>)
Houghton	16%	113	Rural Fringe Rural, Distant (<i>tie</i>)
Livingston	16%	6	Suburb, Midsize
Allegan	15%	18	Rural, Distant
Eaton	15%	15	Rural, Distant
Isabella	15%	7	Rural, Distant
Oceana	15%	29	Rural, Distant Rural, Remote (<i>tie</i>)
Washtenaw	15%	6	City, Midsize Suburb, Large (<i>tie</i>)
Clinton	14%	9	Rural, Fringe Rural, Distant (<i>tie</i>)
Iosco	14%	25	Rural, Remote
Oakland	14%	8	Suburb, Large
Huron	13%	46	Rural, Distant
Jackson	13%	7	Rural, Fringe
St. Clair	13%	7	Suburb, Small
Wayne	13%	4	Suburb, Large
Barry	12%	13	Rural Fringe
Lapeer	12%	13	Town, Fringe Rural, Distant (<i>tie</i>)
Newaygo	12%	8	Rural, Distant
Dickinson	11%	9	Town, Remote
Osceola	11%	36	Rural, Remote
Ionia	10%	8	Town, Distant
Saginaw	10%	12	Rural, Fringe
Gogebic	9%	18	Rural, Remote
Gratiot	9%	21	Rural, Distant
Kalamazoo	9%	7	Suburb, Midsize
Macomb	9%	7	Suburb, Large
Shiawassee	9%	11	Town, Fringe
Bay	7%	7	City, Small
Ontonagon	7%	53	Rural, Remote
Wexford	7%	33	Town, Remote Rural, Distant (<i>tie</i>)
Ingham	6%	10	Rural, Distant
Iron	6%	39	Town, Remote Rural, Distant (<i>tie</i>)
Sanilac	6%	10	Rural, Distant
Benzie	5%	29	Rural, Remote
Kalkaska	4%	22	Town, Remote
Ottawa	3%	7	City, Small
Luce	2%	90	Town, Remote
Marquette	2%	69	Town, Remote
Ogemaw	2%	8	Rural, Remote
Baraga	1%	100	Rural, Remote
Alger	1%	54	Rural, Remote
Lake	0%	32	Rural, Remote
Keweenaw	N/A	N/A	N/A

Average Dual Enrollment Participation Rate/ Miles to nearest Community College by Michigan County



All data provided/compiled by Sean Adams
Map Published on June 12, 2014

0 12.5 25 50 75 100 Miles

Figure 5. Average Dual Enrollment Participation Rate/Miles to Nearest Community College by Michigan County

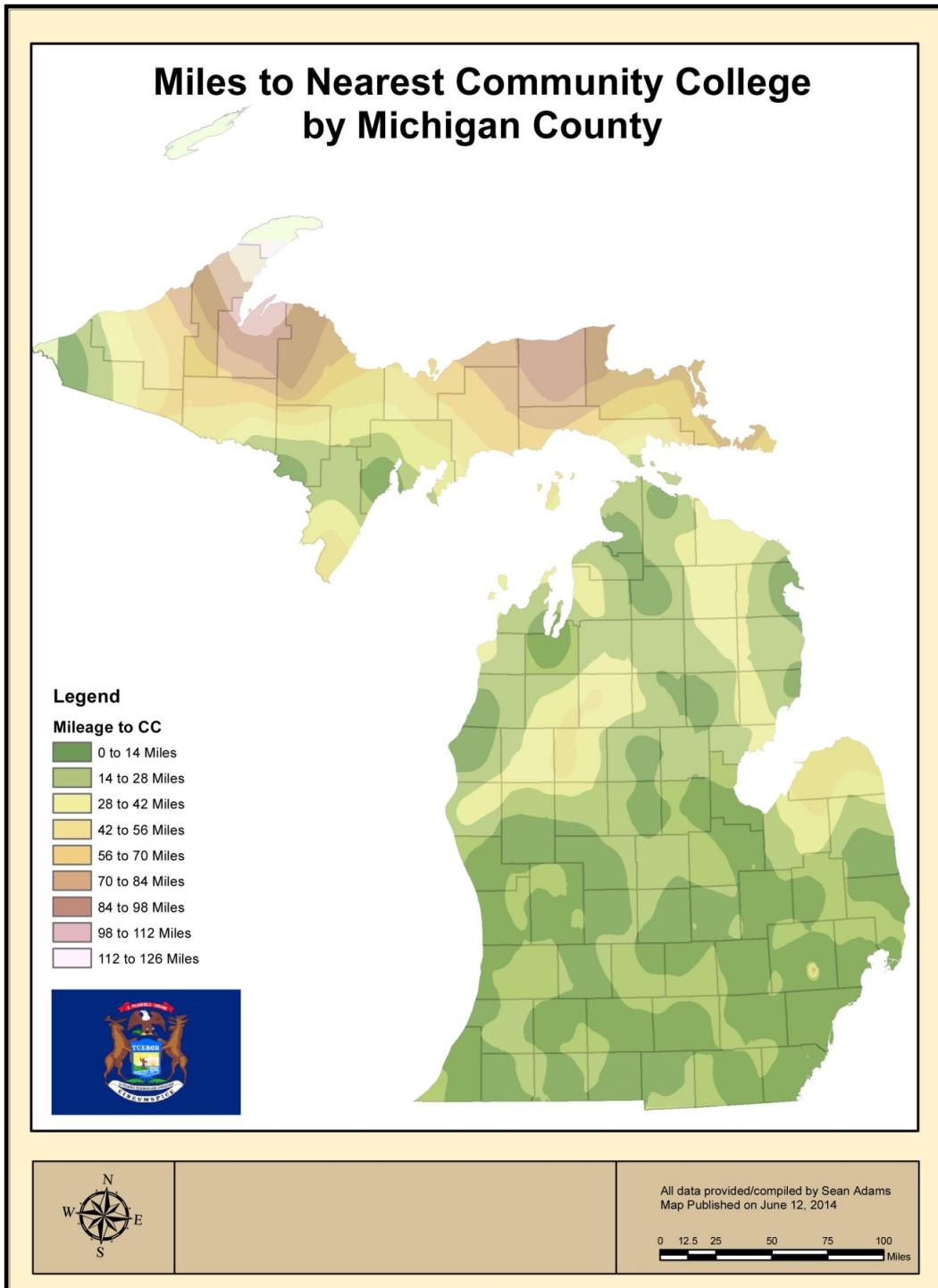


Figure 6. Miles to Nearest Community College by Michigan County

Table 3

State of Michigan Mean Dual Enrollment Participation Rate by School District Type

	LEA Eligible Students	PSA Eligible Students	ISD Eligible Students
Statewide Eligible Students	90,743	2,083	908
Statewide Student Participants	8,794	406	338
Statewide Eligible Student Participation Ratios	1 to 10.319	1 to 5.13	1 to 2:69

Descriptive statistics of the independent variable distance in miles (rounded to the whole mile) between high school and community college campuses can be found in Table 4. Descriptive statistics of the dependent variable, mean 12th grade participation (rounded to the nearest whole integer) can be found in Table 5.

Table 4

Independent Variable – Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Kurtosis	Statistic	Std. Error
Miles	820	126.0	.0	126.0	14.267	18.0552	325.992	11.525	.171	
Valid N (listwise)	820									

Table 5

Dependent Variable – Descriptive Statistics

	<i>N</i>	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Statistic	Std. Error	Kurtosis
Participation	822	1.00	.00	1.00	.1613	.24689	.061	3.709	.170	
Valid <i>N</i> (listwise)	822									

Statistical Significance and Influence Analysis

Statistical significance and influence testing of the independent and dependent variables provided the researcher with a measure of variable relationship significance based on $p < 0.05$. Results of independent samples *t* test analyzing the independent variable—distance in miles (rounded to the whole mile) between high school and community college campuses, and the dependent variable—mean 12th grade participation (rounded to the nearest whole integer) are illustrated in Table 6. The Sig. (2-tailed) values of .798 (equal variance assumed) and .813 (equal variances not assumed) do not meet the scientific significance standard of $p < 0.05$, no presumption against the neutral hypothesis.

When utilizing the means and standard deviations, a Cohen's *d* value of 0.155671 and effect size *r* value of 0.07759394 informs the researcher that the independent and dependent variables have little influence or effect on another, nearly 93% of the change in the dependent variable, dual enrollment participation, being caused by variables other than the independent variable, distance in miles between high school and community college campuses.

Table 6

Participation Rate Group Statistics and Independent Samples Test

Group Statistics					
	Miles	N	Mean	Std. Deviation	Std. Error Mean
Participation Rate	.0	8	.3225	.42881	.15161
	1.0	4	.2500	.50000	.25000
Independent Samples Test					
t test for Equality of Means					
			Sig. (2-tailed)	Mean Difference	Std. Error Difference
Participation Rate	Equal variances assumed			.798	.07250
	Equal variances not assumed			.813	.07250
					.29238

Conclusion

In addressing the research question, *At what rate (percentage) do eligible 12th grade students participate in dual enrollment relative to NCES UCLC classifications in Michigan?*, the researcher was able to determine that the highest rate of dual enrollment participation comes from students living in rural areas, and the least rate of participation from students residing in large urban environments. Determining the level of significance and influence of distance in miles of roadway between high school and community college campus on dual enrollment participation in Michigan, the researcher is unable to arrive upon a statistically significant relationship between the dependent and independent variables. Influence testing reveals little influence of the variables upon one another.

CHAPTER 5

DISCUSSION AND IMPLICATIONS

Introduction

The final chapter reviews the findings presented and the inability to reject the hypothesis. Potential factors that influence dual enrollment participation and the lack of significance and influence of distance between campus locations are explored. Potentially influential variables such as AP, IB, collegiate admission criterion, SES, rurality, and transportation are explored. Techniques of rural dual enrollment practitioners are described. Limitations of the study and inquiry to inform future research are discussed, as is potential researcher bias.

Discussion of Findings

Students in rural Michigan high schools participate in dual enrollment courses at the highest frequency of all NCES Urban-Centric Locale Codes classifications. The hypothesis posed by the researcher, *There is a difference in the percentage of dual enrollment eligible students who dual enroll in urban versus rural areas*, was unable to be rejected; however, the notion that rural students participate in dual enrollment at a much greater frequency than their urban counterparts leads to the natural question of why? Why do rural students dual enroll at a greater frequency than urban students in Michigan? Why are urban students not participating in dual enrollment at a higher rate or at least a similar rate to their rural counterparts? Why do students that live within or outside of community college service districts participate at the same rate? Why is the

distance students have to travel in miles of roadway an insignificant factor on Michigan high school student dual enrollment participation?

Potential Variables Influencing Dual Enrollment Participation

There are many factors that may influence student participation in dual enrollment. Student participation in AP coursework in high school may limit student participation in dual enrollment. AP course delivery occurs at local high schools or online, preventing students from needing to travel for their courses. AP courses are taught by high school teachers that are certified to teach AP courses, which prevents adjunct college faculty from traveling to high school campuses to provide dual enrollment instruction. AP instructors are already compensated by the local school district for educational services, thus eliminating the additional cost of compensating community college dual enrollment instructors. AP courses, like dual enrollment courses, provide the opportunity for students to earn college credit without the cost of tuition being reimbursed back to the community college as in dual enrollment courses. Granted, AP courses must be taught by certified AP instructors who participate in a certification process, which comes at a cost to the local school district. However, this certification cost is a fixed one-time cost, whereas dual enrollment tuition costs per credit will vary year-to-year based on student participation. AP coursework is based on nationally approved curriculum models that are developed by a committee composed of college faculty and AP teachers, and covers the breadth of information, skills, and assignments found in the corresponding college course (The College Board, n.d.). In developing national curriculum models, the College Board surveys professors who teach first-year college courses and synthesizes the material into a single curriculum, representing an aggregate first-year college course with the input of a diverse group of national professors (Klopfenstein & Lively, 2012, p. 61). Perceptions of AP's superiority have

risen from its popularity in top-ranked suburban high schools, perceptions that have influenced education policies and have led to the use of AP in schools where dual enrollment may be a better fit for students (Klopfenstein & Lively, 2012, p. 59). This perception is largely rooted in national curriculum and course design offered by AP, which seeks to replicate the first-year college experience that is representative of any course found across the country. This national curriculum approach is likely to appeal to educators and administrators, who seek standardized curriculums and a common core that will prepare students for diverse academic pursuits post high school. AP courses are thus based on the need to fulfill claims that students who pass the AP final exam have the prerequisite skills to pass a final exam in a comparable class at any college or university in the nation (Klopfenstein & Lively, 2012, p. 61). Credits from AP courses are based on a more heavily weighted scale than normal college courses, allowing students to earn greater than the tradition 4.0-based scale model employed in the vast majority of high schools nationally. Student competition and class rank that are decided largely by GPA may prove to be significant motivating factors for students to enroll in AP courses when competing with one another for their highest class rank. More selective colleges and universities view AP courses more favorably in terms of credit transfer and educational fulfillment than community college courses for which there is no national core curriculum. The national standardized curriculum model, instruction, and promise of preparedness that is associated with AP courses suggest that the delivery of these courses in high schools may have an effect on the number of students participating in dual enrollment courses sponsored by a local community college.

Like the national course/curriculum model utilized by AP, IB programs have become increasingly popular curriculum options in preparing students for postsecondary education. Through collaborative partnerships with schools and educators, IB has

developed programs of international education that are rooted in four main areas: development of curriculums, assessments of students, training and professional development of students, and authorization and evaluation of schools offering IB programs (International Baccalaureate, n.d.-a). Aided in part through calls for common core and curriculum standardization nationally, IB is designed to be an internationally recognized pre-university program for high school students worldwide. An externally validated curriculum, the IB program offers students a unique and challenging college preparatory curriculum. Students take courses in six content areas over a period of two years—a foreign language, the student’s mother tongue, experimental sciences, humanities, arts, and mathematics and computer sciences—three courses at higher level, and three at standard level. All students complete a core consisting of an extended essay, the Theory of Knowledge (TOK) course, and the Creativity, Action, Service (CAS) component. Extended essay functions as a developmental research and writing activity to prepare students for university-level expectations, along with physical fitness, community service, and non-traditional or culturally influenced activities rounding out the curriculum (Culross & Tarver, 2011, p. 233). Currently, there are 67 high schools in Michigan that offer IB curriculums and programs (International Baccalaureate, n.d.-b). Of the 821 Michigan high schools that made up the quantitative analysis, the 67 IB schools represent 8% of all high schools. Due to the rigor and international nature of specialized IB curriculums, it may be possible to presume that students participating in these programs may be less likely to participate in dual enrollment, potentially influencing eligible student participation.

Increasingly, scholars and professionals have recognized a disconnect between the original intention of AP, IB, and dual enrollment programs and their current use—that is, a shift away from helping students earn college credit and prepare for the rigors of

college coursework toward using it primarily as a criterion in admission decisions (Kretchmar & Farmer, n.d., p. 30). As students increasingly compete with one another in gaining admission to highly selective universities, the tendency to view AP and IB for their true purpose—preparation for a college curriculum—may be overshadowed by potential advantages that participation in these programs offers. Much like how AP courses offer a nationalized curriculum and weighted scale to demonstrate consistency and rigor, IB programs offer students a curriculum that is internationally focused. As globalism drives competition for acceptance into elite universities, students, parents, and educators may increasingly view AP and IB programs as an opportunity to “leg up” on the competition, as opposed to credit-earning opportunities for postsecondary scholastic achievement, affecting dual enrollment participation.

SES exerts the greatest impact on parental involvement in rural school involvement than in other types of suburban or urban settings (Sun et al., 1997). As such, parents of higher SES who are engaged in their student’s education are viewed more likely to push students toward enhanced curricular offerings such as AP, IB, or dual enrollment. Unfortunately, the choice of dual enrollment versus AP is not available to the bulk of U.S. students. For students at small, rural, or low-SES schools, AP courses are scarce and, if offered, often fail to provide the well-prepared high-motivated peer group that can make an AP class truly college-like. Although AP courses are increasingly offered online, the combination of limited connectivity, intellectual immaturity, and a lack of structure, peers, and immediate supervision can make success difficult for many high school students, but particularly those who will be the first in their families to attend college (Klopfenstein & Lively, 2012, p. 66). Low-SES schools (urban and/or rural) where high school students may be the first of their family to attend college,

coupled with the school's ability to provide connectivity and engagement through online courses and support, may influence student participation in dual enrollment.

Akin to SES status, low-income and poverty-stricken school districts are viewed as potentially unlikely to provide any dual enrollment or AP course options, as both come at a cost to the school district. Michigan dual enrollment funding legislation reimburses the community college directly from the State Department of Treasury for credits taken by eligible high school students. In cash-strapped local school districts, this could mean a substantial reduction in the cost-per-pupil that the school district receives. Although it may seem minuscule, a minor reduction in per-pupil funding for the poorest school districts could have a significant impact on their operating budget. Likewise, AP courses require that instructors be certified AP instructors to offer those courses. Certification cost of AP instructors may be cost-prohibitive to school districts struggling financially. Although the extent to which cash-strapped school districts participate in dual enrollment or AP course offerings is not known, any decrease in per-pupil funding or instruction certification may be a factor in the decision to offer these options to students. Dual enrollment and AP course costs, when coupled with state and federal funding mandates, may severely limit participation in non-essential instructional activities.

Access to transportation has been cited by researchers as a potential barrier to student involvement in extracurricular and dual enrollment activities. Access to transportation, however, may affect not only rural students, but urban students as well. In fact, access to private or public transportation in urban areas may influence participation in non-high school campus-based activities to a greater degree than many casual observers conceptualize. Although data suggest that urban students in Michigan live in closer proximity to community college campuses than their rural counterparts, there is no control for the student's access to private or public (scholastic or municipal)

transportation, the rate of crime in each school's urban setting, or, more generally, the locus of safety surrounding foot or motorized transportation in and around high school and community college campuses. It is logical to reason that, due to the nature, reliability, and safety of transportation in diverse urban environments, consideration should be paid to access to safe, reliable transportation, as it affects rural and urban students alike.

The question of *why do students that live within or outside of community college service districts participate at the same rate as those that live within community college service districts?* is intriguing. As demonstrated, students who live within a community college service district reside much closer to community college campuses than those who live outside of a community college district—a statewide average of 8 miles between in-district high school and community college campuses, and an average of 25 miles between out-of-district high school and community college campuses. The sheer difference in distance alone motivates one to consider a more in-depth investigation as to why participation rates are the same for students whose high school campus is in-district and those who are out-of-district. As important of a consideration of mileage is potential tuition cost for out-of-district students. A casual observer may conclude that high schools with students participating in dual enrollment that are outside of community college service districts would be required to pay out-of-district tuition rates, and this influence may have an effect on participation rates as the cost to the local school district would be higher. However, this conceptual assumption is not correct. The State of Michigan Department of Treasury acts on behalf of the student's local school district by reimbursing the postsecondary institution an amount equal to the lesser of the amount of the eligible charges or the prorated percentage of the statewide pupil-weighted average foundation allowance, as calculated under section 20 of the state School Aid Act of 1979

(State of Michigan, 2014, pp. 5-8). This reimbursement mechanism effectively removes an additional cost associated with the out-of-district tuition rate assessed by nearby out-of-district community colleges. If in-district/out-of-district cost per credit hour costs is not significant in determining why out-of-district high school dual enrollees participate at the same rate as in-district students, then what is? An inquiry into rural Michigan dual enrollment patterns reveal that direct credit (on-site adjunct instruction), online, hybrid, and collaborative dual enrollment course designs may be significant influences on out-of-district dual enrollment student participation.

Rural Practitioner Techniques in Reaching Dual Enrollment Students

Gogebic and Bay de Noc Community Colleges in Michigan's rural Upper Peninsula have utilized various models of reaching out to students over great expanses of roadway. Gogebic Community College has long partnered with local high schools to offer dual enrollment and other in-demand courses on their campuses in the evening to fit the needs of local populations (E. Skoviera, personal communication, January 24, 2014). Likewise, Bay Community College has extensively utilized the concurrent enrollment approach in eliminating the need for students to travel to their campus, as Bay Community College instructors travel and interweave collegiate courses to dually enrolled students during the course of their regular school day (C. Carter, personal communication, January 24, 2014). North Central Michigan College is offering greatly reduced concurrent enrollment student tuition rates (from \$87 to \$33 per credit hour for in-district and \$37 for out-district) for high school faculty who are able to meet qualification requirements and are willing to teach collegiate courses. According to Wendy Fought (personal communication, January 29, 2014), Director of Student Outreach and Engagement,

This opportunity can help local school districts conserve scarce resources, provide students with collegiate educational opportunities, and diversify the

professional development of the high school faculty, all while providing the opportunity for students to participate in concurrent enrollment. It's a wonderful outcome for everyone.

As part of this program, North Central Michigan College offers considerable one-on-one coaching, course development/planning, and instructional support to high school faculty to acclimate them to the collegiate instructional experience. Offering greatly reduced tuition, less than the state of Michigan equalized rate, coupled with utilizing certified high school faculty to deliver dual enrollment courses on the high school campus in a direct credit format, are a few of the ways that rural Michigan dual enrollment leaders are tackling campus-to-campus distance challenges.

Other rural dual enrollment strategies include a strategic focus on strong partnerships between high school and community college administrators, counselors, and academic advisors. In 2013, Kirtland Community College recognized exceptional high school counselors with their first ever Preparing Students to Be the Future Award. This award was developed by Kirtland Community College in part to recognize the efforts of high school counselors advising and supporting progressive learning outcomes for rural students. Thanks to strong partnerships with high school counselors and administrators, Kirtland Community College has been able to expand dual enrollment opportunities for students through inclusive high school counseling and advising (M. Devine, personal communication, January 8, 2014).

Many rural Michigan community colleges allow dual enrollment students to enroll in any qualified course offered by the institution: traditional face-to-face, online, or hybrid. As rural community college leaders continually refine and improve traditional dual enrollment course delivery methods, the development of hybrid dual enrollment courses is universally seen as an opportunity to expand dual student participation. Hybrid courses combine the best elements of traditional face-to-face course delivery and online

courses to combine classroom and independent study activities into a course applicable for distance and non-traditional learners. According to Kaleta, Grarnham, and Aycock (2005), the goal of hybrid courses is to join the best features of in-class teaching with the best features of online learning to promote active independent learning and to reduce class seat-time. Using computer-based technologies, instructors use the hybrid model to redesign some lecture or lab content into new online learning activities, such as case studies, tutorials, self-testing exercises, simulations, and online group collaborations (Kaleta et al., 2005, p. 1). Facilitating remote rural students to participate in hybrid or online dual enrollment is viewed as another method of eliminating the difficulty associated with great distances between high school and community college campuses. Another unique way rural Michigan community colleges are utilizing hybrid designs for dual enrollment is through partnerships for scarce laboratory and technological resources. According to Richard Smith, the Off-Campus Program Coordinator at Mid-Michigan Community College (MMCC),

MMCC was looking for a way to offer a college science course that could be used to fulfill the Michigan Transfer Agreement requirements and accommodate dual enrolled students. Consequently, a hybrid geology course is currently being piloted with a school district, where the lecture is delivered online and the lab component is offered on-ground. This course provides MMCC with scheduling flexibility and an opportunity to offer a science course that is financially feasible.

Although the concept of partnering with local school districts to offer distance education is not uncommon, strategic identification and utilization of laboratory and capital intensive resources to facilitate hybrid course design is an emergent best practice (R. Smith, personal communication, January 8, 2014). There no explicit explanation why out-of-district students participate in dual enrollment courses at the same rate as in-district students, especially considering the mean difference in mileage those students must travel between campuses. The aforementioned practitioner techniques are likely to

impact dual enrollment participation of out-of-district students and may have influenced the findings.

Limitations

The construct of this cross-sectional study is to provide a state-level observation of dual enrollment patterns in Michigan with specific regard to dual enrollment in urban and rural areas for the period observed. There is no control for generalizability outside of the state of Michigan. The usage of NCES Common Code of Data Urban Centric Definitions to classify Michigan local K-12 LEA, ISD, or PSA building locations is based on national data on what is classified as a large city, small town, etc. The state of Michigan, with high rurality, may not be reflective of national data that was used when classifying said codes.

The campus locations by which high schools and community college campuses were triangulated were based on the 2010-11 high school campus location as provided by the CEPI database and a 2013 search of community college campus locations. It is possible that the 2013 community college campus locations were not the same as those in 2010-11, which may have influenced the independent variable, distance in miles between the high school and nearest community college campus location. The 2013 community college campus location was compiled via web searches on community college websites. This method was hypothesized to be the best means of identifying all community college campus locations, as source material could be obtained through institutionally managed websites.

Instances where community college faculty traveled to provide on-site courses on high school campuses was not accounted for. In many areas across the state where community college and high schools campuses are a great distance apart, community college faculty will travel to high school campuses to deliver courses, rather than

requiring a bus full of students to take the trip to the community college campus. Also, online and hybrid dual enrollment courses were not accounted for. A number of students potentially participated in online or hybrid dual enrollment courses when traveling to the community college campus was not a primary consideration.

Student participation in the CEPI database was not broken into students that participated in dual enrollment at community colleges or four-year universities. Although the exact number of students participating in dual enrollment through four-year universities is not known, it was not, therefore, controlled for as part of this study. In some instances, high schools may have been closer to a four-year university than a community college, which may have skewed the calculation between campus locations. The lack of control for four-year universities offering courses to dually enrolled high school students was largely rooted in the difference in missions between community college and four-year institutions. Community colleges have different course offerings, students, operational structure, governance, funding, and missions than four year universities. As such, four year universities were excluded from the study. Private high schools were not included in the study. The mission and students served by private high schools are separate from those of public high schools, public and private high schools in Michigan not being generalizable to one another, as many private schools are faith-based, require admission acceptance, and require payment of tuition for enrollment. Also, at the time the CEPI database was developed, private schools were not eligible for state reimbursement of dual enrollment credit hours taken by their students like those of public schools. Included as part of the study were Intermediate School Districts, referred to as "ISD" in Michigan. Michigan Intermediate School Districts, although public in nature, serve as a resource to local school districts and offer specialized educational programs for challenged students. Often serving as a resource body for libraries,

equipment, and technological expertise, many ISDs offer programs tailored for students who would not normally be fully served by traditional K-12 LEA or PSA districts.

Students engaged in dual enrollment activities participate at a much greater ratio than students from LEA or PSA districts, which may have an influence on the dataset.

However, ISDs are public schools like those of LEA and PSA districts and were included for analysis based on the public nature of their operation, without control for the students they serve relative to those of traditional districts.

Researcher Bias

A former student of the community college, the researcher has an interest in demonstrating that some phenomenon exists. It is viewed that the premise of dissertation research is to discover something—to contribute to the field knowledge and understanding. Further, being raised and educated primarily in rural areas for much of his scholastic career, the researcher has a desire to reach students with dual enrollment courses that would otherwise be unavailable to students who must travel long distances. The cross-sectional design of the research was used to demonstrate a “before” and “after” effect of State of Michigan Senate Bills 622 & 623 and 709 & 709 of 2011, which became Michigan Public Acts 131, 132, 133, and 134 on May 15, 2012, that significantly expanded dual enrollment opportunities for eligible high school students.

Conclusion

Michigan students in rural areas participate in dual enrollment courses at a greater frequency than those residing in any other NCES classification code. The independent variable, distance in miles of roadway between high school and community college campuses, is not scientifically significant when analyzed in combination with the dependent variable, community college dual enrollment participation. The effect size of the independent variable on the dependent variable is only 7%, leading the researcher to

conclude that 93% of the change in community college dual enrollment participation is caused by variables other than the distance in miles of roadway between high school and community college campuses. Descriptive statistics reveal that although the average miles between high school and community college campuses is much greater for out of community college service district students than those living in-district (25 miles to 8 miles), the students participate at the same statewide dual enrollment participation rate, 16%. Based on the findings presented, how far a student must travel between high school and community college campuses to participate in dual enrollment is not a significant influence on the choice to participate. Likewise, whether a student lives inside or outside a community college service district has no effect on the average statewide participation rate.

Byun et al. (2011) observed that rural students lag behind their suburban and urban counterparts in college enrollment and degree attainment largely because of their lower socioeconomic background. When compared with urban and rural samples, rural youth face more serious economic challenges in attending college and earning a degree. If it is true that rural students are at a disadvantage in degree attainment, it is not for lack of participation of Michigan dual enrollment participants while in high school. Study findings direct the research to more closely consider the conclusion of Borland and Howsen (1999), in their article “A Note on Student Academic Performance: In Rural Versus Urban Areas,” that the fundamental issue explaining student educational attainment is not the rural versus urban areas issue, but the determination of variables within which differences explain the significant variation in student achievement in any area. It is hypothesized that students would be expected to perform similarly, if the associated values of explanatory variables are similar, irrespective of location.

In addressing dual enrollment participation patterns in Michigan, the influences that affect dual enrollment participation should be examined in a multi-regression analysis statewide sample that takes into consideration variables that link early collegiate participation with local school district characteristics and other factors that impact their lives outside of the classroom. Urban, suburban, small town, and rural locale should be considered as a potential variable. Other variables such as AP course offerings, IB curriculums, student SES, school district SES, parental educational attainment, parental involvement, parental marital status, access to transportation, and other aspects should be considered for exploration in ascertaining influences on student dual enrollment participation.

Once identified, educators and practitioners must conceptualize the factors that influence dual enrollment participation at their nearby high schools and community colleges. Specific techniques based on data and best practices should be identified and implemented to address challenges associated with low dual enrollment participation rates in urban and rural areas alike. As education professionals, it is the duty of high school and community college administrators, educators, and researchers to provide every student the opportunity to succeed in taking advantage of dual enrollment opportunities.

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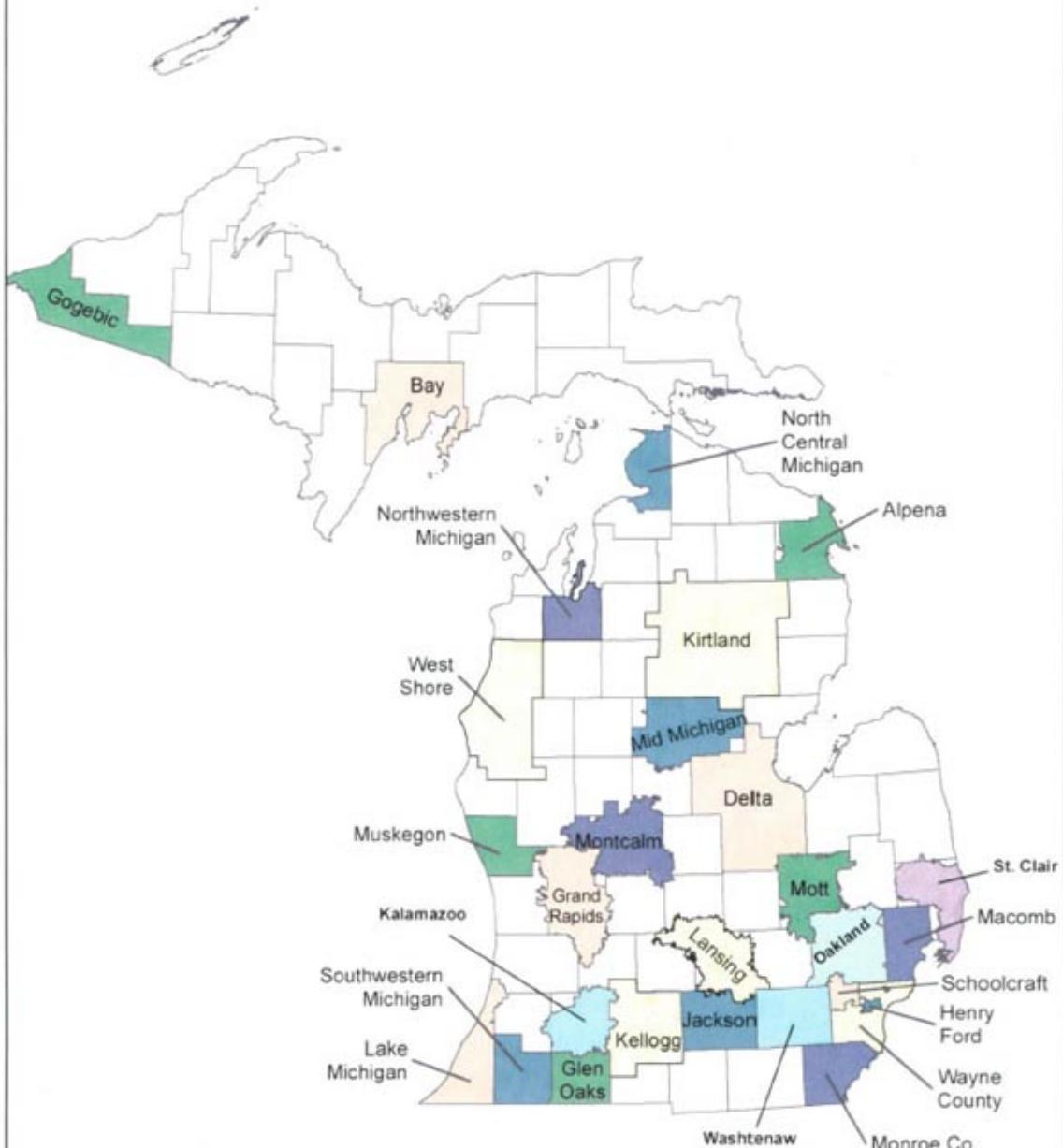
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APPENDIX A

MICHIGAN COMMUNITY COLLEGE DISTRICTS

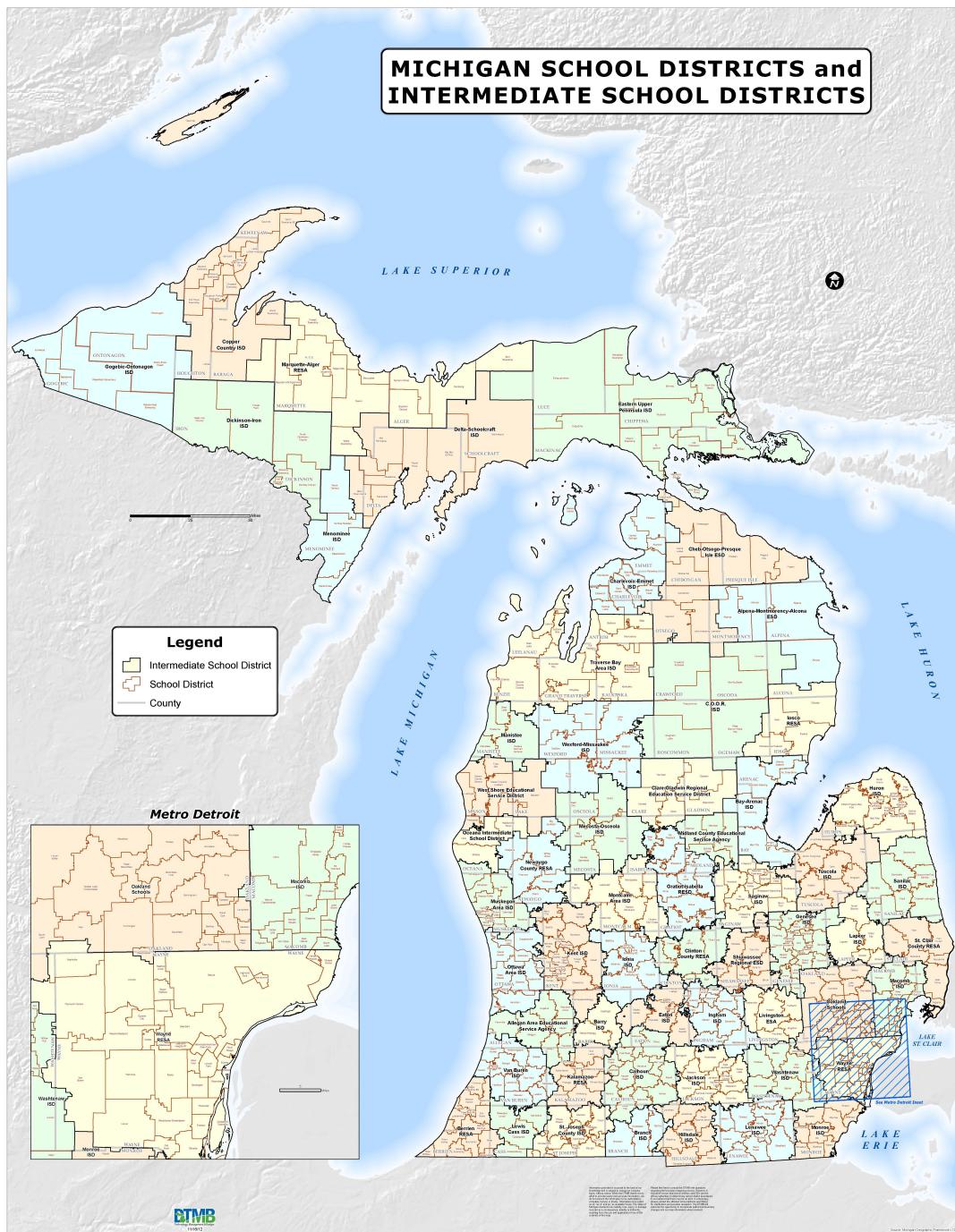
Michigan Community College Districts



Senate Fiscal Agency
July, 2009

APPENDIX B

**MICHIGAN SCHOOL DISTRICTS AND
INTERMEDIATE SCHOOL DISTRICTS**



APPENDIX C

**FERRIS STATE UNIVERSITY HUMAN SUBJECTS
INSTITUTIONAL REVIEW BOARD APPROVAL**

Ferris State University

Institutional Review Board (FSU - IRB)

Office of Academic Research
Ferris State University
1201 S. State Street-CSS 310 H
Big Rapids, MI 49307
(231) 591-2553
IRB@ferris.edu

To: Dr. Dan Burcham and Mr. Sean Adams
From: Dr. Stephanie Thomson, IRB Chair
Re: IRB Application #131011 (Title: *Examining the influence of distance between campuses on high school/community college dual enrollment participation*)
Date: November 8, 2013

The Ferris State University Institutional Review Board (IRB) has reviewed your application for using human subjects in the study, "*Examining the influence of distance between campuses on high school/community college dual enrollment participation*" (#131011) and determined that it is exempt-1E from full committee review. This approval has an expiration date of three years from the date of this letter. As such, you may collect data according to procedures in your application until **November 8, 2016**. It is your obligation to inform the IRB of any changes in your research protocol that would substantially alter the methods and procedures reviewed and approved by the IRB in this application. Your protocol has been assigned a project number (#131011) which you should refer to in future applications involving the same research procedure.

We also wish to inform researchers that the IRB requires follow-up reports for all research protocols as mandated by Title 45 Code of Federal Regulations, Part 46 (45 CFR 46) for using human subjects in research. We will send a one-year reminder to complete the final report or note the continuation of this study. The final-report form is available on the [IRB homepage](#). Thank you for your compliance with these guidelines and best wishes for a successful research endeavor. Please let us know if the IRB can be of any future assistance.