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BACCALAUREATE TIME-TO-DEGREE FOR MONTANA UNIVERSITY SYSTEM

TWO-YEAR COLLEGE TRANSFER STUDENTS

By

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Dissertation

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BACCALAUREATE TIME-TO-DEGREE FOR TRANSFER STUDENTS

Abstract

Thomas Gallagher, June 2017

Educational Leadership

Baccalaureate time-to-degree for Montana University System two-year college transfer students

Chairperson: Frances O'Reilly, Ed.D.

Two-year college transfer education has been promoted as a cost-effective path for achieving the baccalaureate, but increased time-to-degree could nullify this assumption. The Montana University System (MUS) recently expanded the mission for its two-year college system by adding the transfer function.

This non-experimental quantitative research study examined whether a difference existed in baccalaureate time-to-degree for transfer students from MUS two-year colleges. Three years of MUS graduate data (2014 – 2016) was examined in comparing baccalaureate time-to-degree of non-transfer students ($n = 5,953$) with transfer students ($n = 730$). Credit accumulation, GPA, associate degree completion, nontraditional student status, and two-year college organization were also examined.

Baccalaureate time-to-degree took longer for transfer students (Mdn = 6 years) than non-transfer students (Mdn = 4 years, 1 semester) with a statistically significant difference ($U = 1,137,872$, $p < 0.001$, $r = 0.26$). Transfer students had larger credit accumulation (Mdn = 140 – 149 credits) than non-transfer students (Mdn = 130 – 139 credits), but experienced similar academic achievement as measured by grade point average (Mdn = 3.00 – 3.49). Students completing the AA/AS transfer degree in route to the baccalaureate did not experience longer time-to-degree than other transfer students, but AAS degree recipients did take longer. All associate degree completers had greater credit accumulations than other transfer students. No statistically significant differences were observed in baccalaureate time-to-degree or credit accumulation, for transfer students from embedded or independently organized college, or students of nontraditional age. Further observation into the effects of the two-year college transfer function is recommended.

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Dedication

In this life, we all learn and grow from our personal experiences, but I've always felt the real joys in life occur when we are able to share these experiences with others. I'm incredibly grateful to my family and friends. These relationships have nurtured me with strength, joy, and love. These individuals have encouraged and supported me throughout my journey. I dedicate this work to my family and friends.

I'll always be greatly indebted to my mother Joan and father Jim Sr. who made education a priority in our family. My brother, Jim and I are both first generation college students. Joan saw both her boys graduate from high school, while Jim Sr. lived to see both of us complete baccalaureate and master degrees. Our parents were remarkably independent and successful individuals who never had the benefit of a college degree. I dedicate this accomplishment to my parents Jim Sr. and Joan.

During the past five years, my daughter Madelyn has grown up in this unusual household where Dad is constantly reading and writing papers, in addition to working his full-time job. Maddy, I thank you for your patience and support. I have so enjoyed watching you grow from a beautiful child into a fine young lady. I have great faith in you. The world you are entering requires empathy, problem solving and life-long learning. I dedicate this accomplishment to my daughter Maddy.

Nearly 25 years ago, I met this incredible young lady who was working at UM in the Sports Information Office of Grizzly Athletics. It was the beginning of relationship that has blossomed and grown into my most treasured accomplishment. She is my biggest supporter, best friend, and life partner. I fully recognize that it is not always easy being married to someone who seems to be constantly attached to a computer keyboard and screen. Thank you for overlooking

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this fault and the many others I possess. I could not have accomplished this feat without you. As this chapter of our life closes, I thank you for your patience and support. You are my inspiration.

I dedicate this accomplishment to my wife Linda.

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incredible group of talented individuals grounded in a philosophical edict to serve students. I'm honored to work with this exceptional group of colleagues.

Chapter One: Introduction to the Study

The two-year college has been part of the educational system in the United States since the start of the twentieth century. Forty-five percent of all undergraduate students begin their education at two-year colleges (AASC, 2016). These colleges serve as regional centers for higher education and cultural activities in communities of all sizes throughout the country. They differentiate themselves from their four-year campus siblings through open enrollment policies, smaller class sizes, accessible class scheduling, rapidly changing curricular offerings, and lower tuition rates (Cohen & Brawer, 2003; Monaghan & Attewell, 2015; Rouse, 1995). Two-year college programs of study provide students access to post-secondary coursework, certificates, and degrees.

Two-year colleges are known by a variety of different names including junior colleges, technical colleges, and community colleges. The term junior college originally referred to institutions providing courses which fulfill the first two years of study in a traditional, four-year college baccalaureate degree program (Vaughan, 2006). Junior colleges were instrumental in providing transfer education. Technical colleges, vocational education centers, and trade and technical schools were constructed to develop workforce skills. The primary role of these institutions was to provide the career and technical education (CTE) needed for students to gain jobs following graduation (Cohen & Brawer, 2003). CTE programs of study were built to provide an educated local workforce for the industrial age and give citizens the necessary skills for employment. The community college has become the common label in identifying two-year colleges providing transfer education. Cohen and Brawer (2003) defined the community college “as any institution regionally accredited to award the associate in arts or the associate in science as its highest degree” (p. 5).

The various educational roles and function of the comprehensive mission of the community college are commonly described using curricular function (Cohen & Brawer, 2003). The comprehensive community college mission includes the curricular functions of: academic transfer education, career-technical education, developmental education, continuing education, and community service (Cohen & Brawer, 2003). The comprehensive community college mission is a conglomeration of duties formerly associated with the junior college and the vocational technical college.

Community college open enrollment policies are supported through developmental education, allowing all students access to the remedial education needed in preparing for college-level academic work (Cohen & Brawer, 2003). The curricular function of continuing education for adults has early roots in junior colleges and can be connected to the Chautauqua Movement (Scott, 1999) of the nineteenth century. Continuing education provides citizens with lifelong learning experiences and opportunities for professional development using delivery models which may or may not include academic credit. Community colleges are located in close proximity to nearly all communities. They serve as the cultural hubs in geographically remote regions.

The role of transfer education continues to be the least understood of the community college mission with some scholars disagreeing on the legitimacy of the transfer function (Brint & Karabel, 1989; Rouse, 1995). Some experts argue that the transfer function diverts students away from four-year colleges (Brint & Karabel, 1989). The diversion effect postulates that the community college poses as additional obstacle for the student seeking the baccalaureate degree. Other experts argue that the lower tuition prices and open enrollment policies of the community college provide a democratization effect in making higher education accessible to all (Rouse,

1995). The escalating costs of higher education have left students with significant debt (Ma & Baum, 2016; Shapiro et al., 2016). The lower tuition cost associated with attending a two-year college has been viewed as a potential solution by policy makers looking to provide students financial relief in completing the baccalaureate degree (Ehrenberg & Smith, 2004).

Montana University System (MUS) leadership implemented policies and initiatives aimed at increasing attendance and encouraging students to use the two-year college system in obtaining the baccalaureate degree and outlined in the College!Now initiative (MUS, n.d.). According to the Montana Office of the Commissioner of Higher Education (OCHE), these policies sought to enhance the image and improve the transfer function of the two-year college system. According to the MUS (n.d.), 53% of college-bound students chose to attend two-year colleges at the national level, while in Montana only 27% of undergraduates choose two-year colleges (MUS, n.d.).

Research Problem

Baccalaureate time-to-degree could be longer for students choosing the two-year college system. Lengthening time-to-degree would be detrimental to the student as it may result in extra semesters of attendance resulting in additional costs. It could increase the total expenditure in obtaining the baccalaureate degree inadvertently, by increasing overall student expense and debt through lengthened time-to-degree.

Lengthened time-to-degree would be unfavorable to the Montana economy. It could delay students from entering the workforce. It would postponed the ability for students to seek employment and pursue careers.

The national trend of escalating costs for a student to obtain the baccalaureate degree (Monaghan & Attewell, 2015) continues to be an area of concern for leadership in the MUS.

Lengthened time-to-degree due to credit loss, propagates the problem by adding additional semesters of attendance which increase the overall cost of educating a student at publicly funded higher education institutions. Taxpayers in the State of Montana are burdened with the additional expenses incurred when degree completion time is extended.

The research problem was that the increased baccalaureate time-to-degree could increase student expense, student debt, student dropout, and taxpayer burden, while delaying student career entry. It was a problem with broad implications for students, taxpayers, and the Montana economy.

Purpose of the Study

State of Montana leadership in higher education was advocating for greater use of the two-year college system. The reduced rates of tuition provided a distinct incentive for student attendance at two-year colleges. Leadership actions had sought to improve transfer education processes as exemplified by initiatives such as College!Now (Montana University System, n.d.), common course numbering (Montana Board of Regents, 2007), and the MUS transferable core for general education (Montana Board of Regents, 2007). Additional support in the form of State funding for two-year college infrastructure expansion was seen in projects such as the new Missoula College building (University of Montana, 2013). These leadership actions aimed to attract new students to two-year colleges and smooth student transfer from two-year to four-year institutions.

The two-year college system had been proposed as one solution in addressing the escalating costs for students seeking to obtain the baccalaureate degree. This assumption was based upon the lower tuition costs found at two-year colleges. National data indicated that in-state tuition at community colleges is 64% less than in-state tuition at public four-year colleges

(Monaghan & Attewell, 2015). In the State of Montana, differences between full-time tuition rates were not as high as national data suggests, but substantial differences did exist. For instance, at the University of Montana full-time in-state tuition rates for students at the four-year college was \$2,186 per semester, while the in-state tuition at the two-year institution, Missoula College, was \$1,193 (UM Business Services, 2016). Legislators in many states had promoted the community college route as a means to reduce the overall expenditures typically associated with four-year colleges (Kelderman, 2010).

But cost savings for two-year college attendance was based upon an assumption that time-to-degree would be equal for students regardless of the institution. Additional semesters of attendance for degree completion would impact the overall costs for attainment of a student's education. A time-to-degree analysis in Montana served as an important addition to the research literature on the journey of the two-year college students in attaining the baccalaureate degree. It also served as a practical examination for guiding future decisions by Montana leadership in assuming the lower tuition costs of the two-year college pathway results in financial relief for citizens pursuing the baccalaureate.

Few published studies examined the influence of four-year college policy and practices on baccalaureate degree attainment for community college transfer students (Bahr, Toth, Thirolf, & Masse, 2013). A comparison of differences in baccalaureate time-to-degree for two-year college transfer students and non-transfer students in Montana was developed to provide an additional metric in assessing successes related to recent changes in State policy and provide an important contribution to the research literature on the effects of transfer education.

The purpose of this study was to examine baccalaureate time-to-degree for students using two-year colleges in the MUS. Time-to-degree for MUS two-year college transfer students was compared with non-transfer students.

Research Questions

The research question is a declarative statement of interest and the intent of the study. The research question serves as a guide for the researcher to follow throughout the study (Salkind, 2009). Quantitative research questions seek to identify relationships between variables in quantitative studies, while quantitative hypotheses identify predictions about the expected relationships between variables (Creswell, 2009). This intent of this study was to answer the primary research question listed below.

Primary research question. Is there a difference in baccalaureate time-to-degree between transfer students and non-transfer students in the MUS?

Research sub-questions provide ancillary data related to the study. This study attempted to answer the ten research sub-questions listed below:

Research sub-question 1. Is there a difference in credit accumulation between transfer students and non-transfer students completing the baccalaureate degree in the MUS?

Research sub-question 2. Is there a difference in grade point average (GPA) between transfer students and non-transfer students completing the baccalaureate degree in the MUS?

Research sub-question 3. Is there a difference in baccalaureate time-to-degree among transfer students that have completed the transfer associate degree (AA or AS) in the MUS?

Research sub-question 4. Is there a difference in credit accumulation among baccalaureate degree transfer students that have completed the transfer associate degree (AA or AS) in the MUS?

Research sub-question 5. Is there a difference in baccalaureate time-to-degree among transfer students that have completed the associate of applied science degree (AAS) in the MUS?

Research sub-question 6. Is there a difference in credit accumulation among baccalaureate degree transfer students that have completed the associate of applied science degree (AAS) in the MUS?

Research sub-question 7. Is there a difference in baccalaureate time-to-degree between transfer students from embedded two-year colleges and transfer students from independent two-year colleges in the MUS?

Research sub-question 8. Is there a difference in credit accumulation between transfer students from embedded two-year colleges and transfer students from independent two-year completing the baccalaureate degree in the MUS?

Research sub-question 9. Is there a difference in baccalaureate time-to-degree for nontraditional transfer students and nontraditional non-transfer students in the MUS?

Research sub-question 10. Is there a difference in credit accumulation between nontraditional transfer students and nontraditional non-transfer students completing the baccalaureate degree in the MUS?

Definitions

Articulation. The mechanics of credit, course, and curriculum exchange (Kintzer, 1999, p. 148).

Community college. Any institution regionally accredited to award the associate of arts or the associate of science as its highest degree (Cohen & Brawer, 2003, p. 5). Montana has three community colleges: Dawson Community College, Flathead Community College and Miles

Community College (Fisher & Cech, 2011). These colleges are not part of the Montana University System.

Comprehensive community college. Two-year college offering educational opportunities for all adults in the community; academic for transfer to senior institutions, technical and vocational job entry or upgrading, personal enrichment, and community services for community enrichment (Glass & Bunn, 1998).

Democratization effect. Community colleges attract individuals who otherwise might not attend college due to socioeconomic reasons or academic preparation (Brint & Karabel, 1989).

Diversion effect. Community colleges draw individuals away from four-year institutions (Brint & Karabel, 1989).

Embedded two-year college. Two-year college on a separate campus that is structurally affiliated and governed within a regional university. Montana has four embedded two-year colleges: City College, Gallatin College, Highlands College and Missoula College (Fisher & Cech, 2011).

Enrollment continuity. Consecutive terms of attendance by a student, with the summer term typically not included (Crosta, 2014).

Enrollment intensity. Student attendance pattern measured as full-time or part-time status (Crosta, 2014).

First generation college student. Students whose parent never enrolled in postsecondary education (Inman & Mayes, 1999).

Independent two-year college. Two-year college located on a separate campus with independent governance and direct reporting to one of the two flagship universities. Also

referred to as a stand-alone college. Montana has two public, independent two-year colleges: Great Falls College and Helena College (Fisher & Cech, 2011).

Lateral transfer. Transfer from one four-year college to another (Bahr, 2009; Wang & Wickersham, 2014).

Non-transfer student. A student completing all work at a four-year institution. Also referred to as native university student (Glass Jr & Harrington, 2002; Knoell & Medsker, 1965).

Nontraditional student: A student over the age of 24 years old (Bean & Metzner, 1985). Nontraditional students may also have work and family responsibilities.

Reverse Transfer. A process where the student transfers from a four-year college to a two-year college (Cohen & Brawer, 2003).

Socioeconomic status (SES). The social standing of an individual or group as measured by education, income, and occupation (American Psychological Association, 2017).

Stop-out. A break in enrollment continuity of one or more semesters (Monaghan & Attewell, 2015).

Swirling student. Back and forth enrollment between institutions (de los Santos, 2012).

Traditional student. A student between 18-24 years old (Bean & Metzner, 1985).

Transfer. Totality of processes and relationship involved in the movement of students vertically and laterally throughout the education system (Kintzer, 1999, p. 148).

Transfer shock. First term decline in grade point average following student transfer from the community college (Cohen & Brawer, 2003).

Transfer student. Student who has graduated from high school or has earned their GED/HiSET and attempted 12 or more credits at another institution (University of Montana Admissions, n.d.).

Tribal college. A college located on a tribal reservation typically controlled by tribal government. These colleges offer students an alternative cultural environment for students while awarding certificates and degrees including the baccalaureate. Montana has seven tribal colleges (Crofts, 1997). These college are not part of the Montana University System.

Delimitations

The intent of this study was to better understand the transfer function within the MUS. The population of participants in this study were delimited to baccalaureate degree graduates of the MUS from its flagship institutions: Montana State University (MSU) – Bozeman and University of Montana (UM) – Missoula, and the four-year colleges: Montana Tech—UM, MSU – Billings, MSU – Northern, and UM – Western. From this group above, participants in the study were further delimited to non-transfer students and only transfer students from the following MUS two-year colleges: City College – MSU, Great Falls College - MSU, Helena College - UM, Highlands College, and Missoula College – UM.

The purpose of the study was to understand the transfer function within a single statewide system, thus transfer students from other states and private colleges were eliminated as participants from the study. Transfer students from Montana community colleges were not. Students from Flathead Valley Community College (FVCC), Miles Community College (MCC), and Dawson Community College (DCC) were eliminated since longitudinal student data tracking systems between these institutions and the MUS Data Warehouse were incomplete. Tribal colleges were excluded as participants in the study as currently there are no data tracking systems between Montana tribal colleges and the MUS. The transfer patterns of these groups were a confounding element which could have compromised the accuracy and reliability of data used in the study.

Lateral transfer students, reverse transfer students, and swirling students were excluded as participants from the study. Lateral transfer and reverse transfer are outside the scope of the study's research question involving baccalaureate time-to-degree for transfer students at two-year colleges. The rationale, motivation, and characteristics of swirling students was less known and thus proved confounding to the study's research question involving baccalaureate time-to-degree for the two-year college transfer student. Students already possessing a baccalaureate degree (second baccalaureate degree recipients) were confounding to the results of the study and were eliminated as participants of the study.

Limitations

There were several factors which limited the conclusions drawn in comparing baccalaureate degree time-to-degree for non-transfer students and two-year college transfer students. The first was socio-economic status. Two-year colleges were known for serving higher percentages of first-generation students and economically disadvantaged students. These individuals had additional challenges that students with the support of parents possessing baccalaureate degrees and financial means did not face. Different characteristics in the socio-economic status of non-transfer students and transfer students limited conclusions drawn from a baccalaureate time-to-degree study.

Open enrollment policies supported by developmental education programs were an important function of the two-year college mission. Students underprepared for college study were required to complete additional remedial courses as a prerequisite to beginning college-level work, thus extended the time-to-degree for the baccalaureate. The open enrollment policies at two-year colleges limit conclusions drawn from comparing non-transfer students with transfer students in a baccalaureate time-to-degree study

Two-year colleges had higher numbers of commuter students. Social and academic integration had been shown to increase retention and completion (Tinto, 1987). As commuter students spend less time on campus, they may face more difficulties in becoming socially and academically acclimated (Stewart & Rue, 1983). Additionally, transfer students are forced to face additional acclimation issues when matriculating to the four-year college. Differences in social and academic integration posed as a limitation in comparing non-transfer students and transfer students in a baccalaureate time-to-degree study.

Accurate information on which classes were accepted for the baccalaureate degree from one institution to another, served as an additional challenge faced by transfer students (Tinto & Pusser 2006). The mechanics of the transfer process, articulation, and consistent advising between campuses were a limitation for time-to-degree comparisons between transfer and non-transfer students. Student advising services on the various MUS campuses vary in both practice and resources.

Two-year colleges serve higher percentages of nontraditional students. These students face challenges with raising families and work responsibilities that may cause limitations in enrollment intensity and continuity which may lead to extended time-to-degree. Comparisons between transfer and non-transfer students were limited due to the higher percentage of nontraditional students found at two-year college campuses.

Consistency in data collection and reporting was a limitation uncovered in the study. Inconsistencies were found in how institutions chose to make use of coding schemes available for data tracking. As an example, the field entitled “previous college code” was used by the majority of institutions to record the MUS two-year campus previously attended by a participant, but one embedded institution chose to populate this field with the same value for its two-year and

four-year colleges. Correcting the data required developing an additional algorithm to populate this field with the correct previous college (see Appendix D for complete details). As another example, credit accumulations reported for graduation among several groups of participants did not meet the minimum 120 credit criteria required for the baccalaureate in the MUS. The cause was likely that credits were either not recorded correctly or not following students from one institution to another in the tracking system. Participants with less than 120 credits were removed from credit accumulation analysis. Consistency and accuracy in data reported by MUS campuses to the MUS Data Warehouse were a limitation to the study.

Lastly, a limitation of this study was the relatively short period of time which had elapsed since adoption of MUS policies and initiative meant to encourage student transfer. Policies may not immediately influence changes in behaviors. The social system model (Getzels & Guba, 1957) stated that institutions are purposive and structural, but they are also peopled and normative. Although policy provides incentive, it does not result in an immediate change in culture. Changes in cultural and social behavior take time. The findings from the study served as an early barometer for policy assessment.

Significance of the Study

The significance of the findings from this study could prove useful to leaders in the Montana Legislature and the MUS. Public policy promoting transfer processes had been developed over the past decade, yet limited analysis was conducted in examining the resulting benefit to students. The findings of this study could serve as one measurement in evaluating the effects of higher education public policy for leadership.

The findings of the study could be significant to students and parents considering options for higher education. Although the cost at the onset may appear less for individuals entering

baccalaureate degree programs at the two-year college system, the overall time for completion may prove to be more costly. It could serve as a barometer in assessing the value of the transfer function at two-year colleges. It could reinforce or discredit the premise that community colleges provide relief to the escalating costs of higher education.

Access to higher education in sparsely populated rural states poses challenges in educating citizens. The findings of the study were significant in examining baccalaureate time-to-degree for students at independent two-year colleges located on campuses outside of commuting distance. The findings from the study shed light on the accessibility of higher education for rural citizens.

The study's findings were significant in examining academic preparedness of students pursuing the baccalaureate degree at open-enrollment campuses. By comparing grade point averages (GPAs), the findings of the study could be used as a measurement in assessing the academic performance of the transfer student.

Summary

Two-year colleges are a fixture in the higher education system for all states. Although the role of the two-year college in providing career-technical education is well documented, its role in baccalaureate programs is less understood, yet academic transfer remains a substantial component of the curricular function of these colleges (Cohen & Brawer, 2003). Many individuals choose the two-year college as a starting point for completion of the baccalaureate degree. This decision could increase the baccalaureate time-to-degree. State leaders in Montana had implemented policy and initiatives aimed at improving the transfer of credits earned at two-year colleges, but a formal analysis assessing the impact of these programs on baccalaureate degree time-to-degree had yet to be accomplished.

Chapter Two: Review of Related Literature

Research studies are built upon the works of other researchers and findings from their studies (Salkind, 2009). The literature review provides a synthesis of other studies on a chosen topic, critically examining and summarizing the findings of other researchers (Pan, 2016). Boote and Beile (2005) describe the important phenomenon of scholarship as a means to improve usefulness of education research and increase methodological sophistication. These authors describe sufficient coverage of the material, synthesis of relevant topics, methodology for inclusion and exclusion of material, and rationalization for the significance of the study as a five criterion framework for developing an effective literature review. The review is meant to provide the reader with a coherent summary of related literature written with sufficient clarity and rhetoric.

This review of related literature for the study of transfer student baccalaureate time-to-degree across a statewide system of colleges and universities will employ a comprehensive examination of the wholeness of the system, conducted from the perspective of the Getzels and Guba's (1957) social systems model. The systems model "is composed of interacting sub-parts, and the interaction is regulated by the system as a whole. Each system is open to influence from other systems, and each part may also be a part of more than one system" (Thelen & Getzels, 1957, p. 343). The value of the system approach is that it allows the researcher:

to interpret and to order data from many sources within unifying broad conceptions, for example, culture posits a basic set of assumptions regarding the values, goals, and dynamics of adaptation of a given society. Without these assumptions, the observed phenomena-the behavior, customs, products, institutions-of the society seem inexplicable.

With these assumptions, the observed phenomena “fit together” and “make sense”.

(Thelen & Getzels, 1957, p. 344)

The researcher can study a particular issue associated with the institution, “but, unless he takes the broader view, he cannot place the actions he observes in the context of the educational goal of the community” (Thelen & Getzels, 1957, p. 345). Institutions are purposive, in that they exist to carry out a particular function within the social system and are ultimately judged by criteria associated with that function (Getzels & Guba, 1957). Yet to carry out function, institutions also require people acting as agents, structure containing the rules to achieve its function, norms for behavior, and sanctions insuring compliance to these norms of behavior (Getzels & Guba, 1957). Examining the structure and function of the system in its entirety allows the researcher to understand the observed phenomena in its appropriate context. This is the theoretical framework for review of related literature.

A mission statement is used to define the purpose of the institution (Lake & Mrozinski, 2011). Public statements of mission are used to guide educational leaders and accreditation bodies of the college’s intentions (Lake & Mrozinski, 2011). Mission is also determined through programmatic offerings (Dougherty & Townsend, 2006). Cohen and Brawer (2003) use curricula as a means to describe the multiple functions of the comprehensive community college mission. Academic transfer, career-technical education, developmental education, and community service are the curricular functions assumed in the comprehensive mission of two-year colleges in the United States (Cohen & Brawer, 2003). Transfer education is one of the many mission functions assumed by comprehensive community colleges (Cohen & Brawer, 2003; Vaughan, 2006), yet transfer is seen as its most controversial function (Alfonso, 2006; McPhail & McPhail, 2006).

A third method in determining the community college mission is through its effects (Dougherty & Townsend, 2006). Although public statements and programmatic offerings are overt and intentional, effects are covert and unintentional (Dougherty & Townsend, 2006). It is the effects of the community college transfer mission which fuels the dissention amongst its critics (Rouse, 1995). Yet without an understanding of culture embedded within a society, the behaviors of that society seem inexplicable (Getzels & Guba, 1957). The community college operates as its own social system with its own culture, but the social system of the community college also operates as a sub-system, coexisting within the context of other political and economic systems inside the larger system of society (Getzels & Guba, 1957).

Framing the study of transfer student baccalaureate time-to-degree across a statewide system of colleges and universities involves the examination of complex social systems and a web of purposive, peopled, structural, normative, and sanction-bearing institutions (Getzels & Guba, 1957). Thus in addition to mission, a synthesis of two-year college history and culture are foundational in understanding the phenomenon of academic transfer.

This literature review will be presented as follows: The evolution of the two-year college system in the United States and the State of Montana will be presented from a historical perspective. The characteristics of the community college comprehensive mission will be examined as conceptualized through public statements and programmatic offerings (Dougherty & Townsend, 2006). The culture of two-year colleges will be surveyed, including its student demographic group, faculty, and institutional characteristics. The phenomenon of academic transfer and the effects of the community college transfer mission (Dougherty & Townsend, 2006) will be studied as an individual institutional function and in the context of a complex social system (Getzels & Guba, 1957), examining the contradictory perspectives among

researchers as to whether the two-year college system provides a democratizing or divertive effect for those students pursuing the baccalaureate (Rouse, 1995). Lastly, a synthesis of the findings from over fifty purposely selected dissertations studies completed in the last twenty-five years will be examined from the perspectives of: the transfer phenomenon; characteristics of the transfer student; state policy and institutional processes; and persistence and completion time.

Historical Perspective of Two-year Colleges

The history of the Nation's two-year college and the history of the two-year college system in the State of Montana will be examined in this section of the review of relevant literature. In examining transfer student baccalaureate time-to-degree, an understanding of the successes and challenges leading to the formation of our present day institutions is essential in framing the background for the study.

National context.

Scholars credit Joliet Junior College as the Nation's first two-year college (Vaughan, 2006; Tollefson, 2009). A new model of public higher education was introduced with the opening of the University of Chicago in 1892 under the guidance of William Rainey Harper (Rudolph, 1990). Harper envisioned reshaping the traditional post-secondary education by dividing the four-year degree into two distinctive parts. The junior college would consist of the first two years of education with a focus on "collegiate and preparatory" (Rudolph, 1990, p. 351) education, while the senior or university college would be known for its "advanced and scholarly" work. Harper's vision of higher education resulted in the founding of Joliet Junior College in 1901. Joliet Junior College was initially housed at Joliet High School, but quickly grew into its own facility by 1915 (Rudolph, 1990). Initially built upon the high school system, it

is widely credited to be the first two-year college in the country (Vaughan, 2006). It was the junior college that paved the initial pathway for the curricular function of academic transfer.

The Morrill Act (1862, 1890) served as a funding catalyst for initiating public higher education through federal funding (Cohen & Brawer, 2003; Association of Public and Land-grant Universities, 2012). Although the Morrill Act provided support for public universities, the birth of Joliet and other two-year colleges were more tightly intertwined with the nation's secondary school system (Tollefson, 2009). The Kalamazoo Decision (1874) was seen as a landmark event for two-year colleges in that it provided the revenue stream for funding public secondary education (Knight, 1949; Rudolph, 1990; Vaughan, 2006). This ruling by the Michigan Supreme Court reinforced the precept that voter consent is not limited to the funding of primary-level schooling. It paved the way for the modern concept of the publicly funded high school and its comprehensive programming. The mission of the University of Wisconsin (1904) further delineated the expansive mission of public higher education in declaring the entire state as its campus, opening the door to new opportunities for providing extension services in remote sites. The "Wisconsin Idea" was an early implementation of the two-year college function involving the delivery of regionally-based services and education (Rudolph, 1990). Organization of junior colleges continued in communities throughout the country. Local districts were used to fund junior colleges and most developed without oversight from state legislative bodies. The right to levy local funding in support of the junior college was tested in the court system of North Carolina. The Asheville Decision (1930) by the North Carolina Supreme Court reinforced the rights of municipalities to create junior colleges through the use of public funding mechanisms (Vaughan, 2006). State funding to launch the system of junior colleges in the State of California was fueled by the Junior College Act (1921) using federal proceeds from mining revenues.

California's legislation served as a funding model for developing two-year colleges which other states followed in subsequent decades (Tollefson, 2009). These early initiatives paved the trail for the publicly funded revenue streams for two-year colleges. Nearly a century later, Tollefson (2009) notes that the largest funding sources for operations at community colleges are state government (47%), local government (19.5%), student tuition and fees (19.5%), and federal government (5%) during the period 2000-2001.

Equally influential in discussions involving the early roots of two-year colleges was the Chautauqua Movement (Scott, 1999). John H. Vincent was credited as founder of the Chautauqua Literary and Scientific Circle (1878) which pioneered the first adult education and correspondence courses in the nation, serving as the predecessor to the concept of lifelong learning for adults. Vincent's contributions to the Chautauqua Movement were foundational in the development of community education programs at community colleges and the democratization of education by providing access and equal opportunity to education regardless of social class, age, or gender.

In the early twentieth century, the quality of junior colleges was enhanced through the development of academic accreditation bodies and accreditation standards, the founding of professional organizations, and the recognition of student academic achievement. The North Central Association of Colleges and Schools established criteria for institutional recognition of academic accreditation through the Junior College Accreditation Standards (1917). The American Association of Junior Colleges (1921) was established as a professional society to support and assist junior college administrators. The Community College Journal (1930) was introduced by the School of Education at Stanford University as a channel for publishing

scholarly articles pertinent to junior colleges. These efforts were formative in developing the culture of the two-year college.

The State of Mississippi (1928) was credited with creating the nation's first state-level governance board for junior colleges (Vaughan, 2006). The Mississippi State Board for Community and Junior Colleges was formed to organize and provide oversight in providing transfer and vocational-technical education at two-year colleges across the state. The Phi Theta Kappa Society (1918) was established to recognize student achievement. Phi Theta Kappa distinguished students excelling in academic achievement, leadership, and service.

Growth in two-year colleges was further fueled by the demand for inexpensive and convenient post-high school education which could serve in meeting the needs of the high school graduate looking for an alternative to liberal arts education (Pedersen, 2000). William Snyder is credited with leading an alternative two-year college curriculum based upon vocational education at Los Angeles Junior College in the 1920s (Pedersen, 2000). These developments marked the early formation of career-technical education for the two-year college system.

Other discussions in California involved moving the first two years of college from universities to junior colleges, changing the role of the university to graduate work and upper-division education through the junior and senior years (Cohen & Brawer, 2003). In the 1930s, Leonard Koos promoted the 6-4-4 plan as a paradigm for the reorganization of the traditional k-12 education system and a means to better integrate the first two years of college with secondary schools (Cohen & Brawer, 2003; Kisker, 2006; Koos, 1944). The 6-4-4 plan consisted of a primary school with grades k-6, a junior high school of grades 7-10, and a combined high school, junior college for grades 11-14. By moving the junior college into the traditional high school system, Koos' 6-4-4 model sought to improve efficiency and provide cost savings. The 6-4-4

plan of middle college high school still exists today and is seen in early college high schools and dual-enrollment programs where high school students earn college credit (Kisker, 2006).

Early junior colleges were the outgrowth of local initiatives seeking to enhance secondary educational opportunities. Early junior colleges modeled the curriculum and practices established at four-year institutions. In some communities local funding initiatives to establish two-year colleges were approved, while in other communities these initiative were defeated as opponents questioned costs and the responsibility of the state to fund higher education. Deliberate planning was seen as a characteristic in communities where funding was successful (Pedersen, 2000).

The Truman Commission Report was published by the President's Commission on Higher Education in 1947 (Vaughan, 2006). The Commission recognized the important role the Federal Government could play in higher education. At a time when education was seen as the primary domain of the state, the recommendations of the Truman Commission (1946) called for involvement and action by the Federal Government as a partner in post-secondary education (Gilbert & Heller, 2013).

One of the key recommendations of this report was to double the number of students attending college by the year 1960. To accomplish this goal, the higher education system would need to increase its capacity to absorb more students and overcome the financial barriers confronting individuals from lower income families. The Commission viewed higher education as a tool to enhance the Nation's economic vitality for all citizens (Gilbert & Heller, 2013).

To achieve this significant increase in enrollment, the strategy of the Truman Commission (1946) was to eliminate discriminatory practices involving race, religion, and sex, and financial barriers for all Americans. These committee recommendations were ambitious during a time of racial barriers, such as separate but equal systems of public education (*Plessy v. Ferguson*, 1896),

while the landmark ruling of *Brown v. Board of Education* (1954) or passage of the Civil Rights Act (1964) had yet to arrive. The Nineteenth Amendment to the Constitution granting women the right to vote was ratified less than twenty years earlier, barely allowing time for society to overcome traditional stereotypical roles facing a new generation of women. Additionally, the Title IX clause of the Higher Education Act (1972) guaranteeing equal rights in education for women would not be seen for another twenty years. Religious discrimination, particularly against Judaism, had been seen throughout the world prior to World War II. The report recommended ending potentially discriminatory practices such as requesting religious affiliation on college admission applications. The vision of the Committee created opponents with arguments regarding overreach of the Federal Government, objections to public funding of higher education, concerns as to the impacts on existing private and public institutions, resistance to desegregation, fears of incompetent students, and potential loss of academic freedom (Gilbert & Heller, 2013). When viewed through a modern lens, these recommendations were transformational to both higher education and society as a whole. It served as a formative catalyst in developing our current universities and colleges.

Two-year colleges were to experience great change as a result of the recommendations made in the Truman Commission Report. The Commission sought to transform junior colleges into community colleges based on the precepts of local control, regional scope, fit within a statewide system of higher education, and service to the interests of both the state and the local community (Gilbert & Heller, 2013). The Commission envisioned tuition-free access to grades 13 and 14 for all citizens funded through local mechanisms and limited state assistance in a system similar to the established k-12 structure. It recommended continuation of the traditional general education offerings at junior colleges, with additional programmatic offerings and a

community focus as envisioned in a new title: the community college. These programs included adult education, vocational apprenticeship training, acceptance of part-time and noncontiguous student enrollment patterns, support structures for older students, and content tightly-woven with high school curriculum (Gilbert & Heller, 2013). The expansive role assigned by the Committee allowed the community college system to experience enormous growth forging a new demographic composition in its student population characterized by higher percentages of female students, minority students, part-time students, and students of nontraditional age.

The Truman Commission's vision of higher education was "remarkably ahead of its time" (Gilbert & Heller, 2013, p. 439) with perhaps its greatest transformational influence on the modern community college system. Noteworthy to educational leaders is the time difference between publication of the Commission's recommendations and the realization of these recommendations by society. Although the Truman Commission report was published in 1947, significant change in the number of college students and the varied demographics of race and sex were not evident until the 1960s and 1970s. Over fifty years later, society is attempting to further implement other recommendations envisioned by the Commission. The recommendation of tuition-free higher education at two-year colleges still has not been achieved, but it is alive today as evidenced by President Barack Obama's State of the Union Address (2015). Tuition free education remains the unrealized dream of two-year colleges (Gilbert & Heller, 2013).

Although funding resources for public two-year colleges have remained relatively unchanged, the exact proportion of local taxes, state taxes, federal taxes, student tuition, and private donations used to fund these institutions has seen variability over the years (Cohen & Brawer, 2003; Vaughan, 2006). A consistent theme in funding discussions at two-year colleges is the comparatively low tuition rates charged to students. A concerted effort has taken place in all

states to ensure tuition rates at public two-year colleges remain lower than public four-year colleges. For instance, in 2016 the average annual tuition rate at two-year colleges (\$ 1,429) in the State of California was 15% of the average rate at four-year campuses (\$ 9,346), while in the State of Montana the average two-year college tuition was 52% of the average tuition at the four-year colleges (\$ 6,409) (College Board, n.d.).

Another notable trend in the history of two-year colleges is the allocation of federal funding distributed to state systems, rather than directly to the individual institutions. This third party arrangement shifted the responsibility for distribution of federal funding allocations for individual institutions to the state. A number of these federal initiatives focus on vocational-technical programs of study. The Vocational Education Act (1963, 1968, & 1972), the Carl D. Perkins Vocational Act (1984, 1998, & 2006), and the 2009 Trade Adjustment Assistance Community College and Career Training Grant (TAACCT, 2009) all provide federal funding for career-technical education at two-year colleges through State-level partnerships (Cohen & Brawer, 2003; Department of Labor, 2011). The Higher Education Facilities Act (1963) provided federal financial resources for communities to construct and enlarge facilities. This Act resulted in new construction at community colleges throughout the Nation. The Tribally Controlled Community College Assistance Act (TCCCAA, 1978) was instrumental in providing federal funding in establishing and supporting tribal colleges. This legislation provided financial resources for expansion of the two-year college system at regional locations on Native American Reservations throughout the Western United States (Vaughan, 2006). Resources to support tribal colleges were further strengthened through the Elementary and Secondary Education Reauthorization Act (1994) which declared all seven Montana tribal colleges as land-grant institutions (Association of Public and Land-grant Universities, 2012; Crofts, 1997).

Another resource of federal assistance for two-year colleges is financial aid awarded directly to students through grants and loans. This has been a critical element in minimizing the financial burden associated with obtaining higher education for individuals from families of lower socio-economic groups. The Serviceman's Readjustment Act or GI Bill (1944) is credited as the first significant federal assistance program. The GI Bill was meant to provide assistance to veterans returning from World War II and implemented to alleviate fears of the potential for another depression if these veterans were not absorbed in the workforce (Vaughan, 2006). The Higher Education Act (HEA, 1965) provided financial aid for students of families without the financial means to attend college. The recommendation of the Truman Commission to eliminate some of the financial burden of higher education for low-income students is realized in the HEA (Gilbert & Heller, 2013). The Basic Educational Opportunity Act or Pell Grant (1972) provided additional financial support to students based upon family income. Pell grants were seen as a catalyst in the formation of financial aid offices at many two-year colleges (Cohen & Brawer, 2003).

Financial aid has become an instrumental resource for eliminating many of the financial barriers faced by students from low-income families. Without the support of grants and loans, the financial opportunity for pursuing higher education would not be available to this particular student demographic group served by the two-year college (Cohen & Brawer, 2003).

State of Montana.

The Community College Journal, initially published under the title The Junior College Journal, reported in its very first edition in October 1930, under the news section "The Junior College World" in a brief announcement stating "Mount St Charles Changes Program: Mount St. Charles College, a Catholic institution which has been doing junior college work at Helena,

Montana, since 1917, is broadening its program into a four-year college offering” (“The Junior College World”, 1930, p. 39). The private Catholic college Mount St. Charles was later renamed Carroll College and based upon this journal article is credited as the first two-year college in the State of Montana. Upon its creation, Bishop John Carroll stated at the ceremonial laying of the institution’s cornerstone in 1909:

The aim of [this] College will be to give the young [people] of Montana a thorough, liberal education which will fit them for leadership in any vocation they may choose and at the same time, so surround them with a religious atmosphere that they will ever follow conscience as their king. Knowledge and virtue are the armor with which [this] College shall strive to equip students ...

US President William Howard Taft, participating in the ceremony stated:

It gives me great pleasure indeed to participate in the laying of the cornerstone of this and other educational institutions. We are liberal enough in this country to assist in the promotion of the work of all religious denominations. The college you are building will be a blessing to Helena and to the whole state of Montana. The only trouble is we have not institutions enough of this kind in the United States. (Carroll College, n.d.)

The endorsement of President Taft and the mission statement provided by Bishop Carroll create a dramatic beginning to two-year education in the State of Montana.

The history of public two-year colleges in Montana began in 1939 with State legislation enabling the creation of local community college districts. Miles City became the first community to utilize the new statute in the founding of Miles Community College (Crofts, 1997). The community of Glendive followed suite by founding Dawson Community College in 1940. The institutions were housed in vacant rooms available in the high schools. Both colleges

moved into their own building by the 1960s. In the Northwest region of the State, the Kalispell community created the newest community college nearly 25 years later with the founding of Flathead Valley Community College in the 1960s.

Unique to the Montana two-year college landscape are tribal colleges. Seven of the twenty-four tribal colleges established in the United States are located in the State of Montana (Carnegie Foundation for the Advancement of Teaching, 1989). These institutions are located on tribal reservations in some of the most remote regions of the continental U.S. With a student population consisting primarily of Native American students, these institutions provide an alternative institutional culture which reinforces Native American values. It provides a unique educational environment not found in other institutions of mainstream higher education. These colleges were established in the 1960s, 1970s, and 1980s through extension campus partnerships with other two-year colleges and education programs associated with the Bureau of Indian Affairs (BIA), tribal colleges have progressed into regionally accredited independent entities overseen by tribal government (Crofts, 1997). Tribal college missions align with the comprehensive community college mission of transfer education, career technical education, developmental education, community service, and continuing education. Tribal colleges serve as the center of their community in providing cultural and recreation offerings, while each institution carries a name of historical significance to the communities they serve. Tribal colleges are credited with increasing student retention and degree completion among Montana's largest minority population, Native Americans (Crofts, 1997).

Tribal colleges establish a learning environment that encourages participation and builds self-confidence in students who have come to view failure as the norm. Tribal colleges celebrate and help sustain Native American traditions. They provide essential community services and

they serve as centers for research and scholarship (Carnegie Foundation for the Advancement of Teaching, 1989).

Although not associated with the Montana University System (MUS), healthy relationships exist between tribal colleges and MUS institutions as evidenced by successful student transfer. Montana's seven tribal colleges are: Salish Kootenai College, Blackfeet Community College, Dull Knife Memorial College, Little Big Horn College, Fort Peck Community College, Stone Child College, and Aaniiih Nakoda College.

The Helena Vocational-Technical Center (Vo-Tech) was founded by the Montana Office of Public Instruction (OPI) in 1939. Tightly entwined with the high schools, the Helena Vo-Tech educated thousands of individuals for production enterprises associated with World War II. These included workers knowledgeable in production works associated with aircraft facilities and shipyards. After the war, education offerings evolved to support welding, electronics, auto repair, nursing, business, and agriculture.

In addition to the Helena Vo-Tech, OPI designated four other training centers across the State of Montana in 1939. The communities of Butte, Great Falls, Billings, and Missoula were chosen as educational centers. These communities chose not to develop Vo-Tech education centers until funded by the Montana Legislature in 1969. The 1972 State Constitution charged the Montana State Board of Education with governing the k-12 public schools and the vocational technical centers. These two-year colleges remained under control of the k-12 school system until 1987, when the Montana Legislation moved these institutions to the guidance of the University System Board of Regents. In addition to reorganizing the system of governance for Vo-Tec centers, House Bill 39 limited local funding opportunities for these institutions. Unlike the community colleges, these institutions would now be entirely dependent upon State funding

for all of their expenditures. In 1993, higher education in Montana underwent another transformation in designating the two largest universities, located in Missoula and Bozeman, as flagship institutions. The four other four-year colleges and the five two-year Vo-Tec Centers were joined with the flagship institutions located in Missoula at the University of Montana or Bozeman at Montana State University (Crofts, 1997). The five, two-year Vo-Tec centers were renamed Colleges of Technology with affiliation given to one of the flagship institutions. For instance, in Great Falls, the Great Falls Vocation Technical Center was renamed Montana State University, Great Falls College of Technology.

Three of the two-year colleges were located in the same community as four-year institutions. Due to their close proximity, the Colleges of Technology located in Billings, Butte, and Missoula were able to share resources and governance with their four-year affiliates, and thus these institutions were labeled embedded two-year colleges by the MUS (Fisher & Cech, 2011). Proximity from flagship institutions influenced creation of different organizational structures at Colleges of Technology located in Great Falls and Helena. Distance between campuses made resource sharing more difficult, but also provided greater autonomy and flexibility in self-determination. These institutions were labeled independent two-year colleges (Fisher & Cech, 2011) and were provided greater independent governance, but maintained a strong affiliation to a flagship entity exemplified by name and identity. The varied organizational structures between the embedded two-year colleges and independent two-year colleges were seen in titles and duties of administration. At Helena College of Technology, the top administrator carried the title of CEO answering to the flagship institution's President, while the top administrator at the Missoula College of Technology was Dean answering to the same flagship institution's Vice President for Academic Affairs. Other differences were found in the

curriculum governance processes at the embedded colleges, but all embedded colleges retained independent faculty labor associations from their four-year college peers (Office of the Commissioner of Higher Education, n.d.).

Despite these changes, the mission of the two-year colleges remained rooted in vocational and technical education with the goal of preparing individuals for life skills, careers, and jobs. Accommodations were developed by the Board of Regents to expedite curriculum modifications at two-year colleges with the goal of providing relevant programs of study which are responsive to the needs of business and industry. Despite new affiliations with four-year campuses, the Board of Regents were intent that Colleges of Technology remain focused in their role of providing career-technical education as described in the following statement:

The Commissioner of Higher Education is directed to place particular emphasis on the concerns that have been expressed about mission drift, funding inequities, responsiveness to business and industry, and the unique role that the technical centers have played in Montana higher education. (Office of the Commissioner of Higher Education, 1994)

The Regents were committed to maintaining quality two-year education capable of preparing individuals for high demand, high wage jobs through career-technical education. Any concerns involving mission drift for the Colleges of Technology were clearly addressed in this statement by the Board of Regents.

Despite the drastic organizational changes occurring in the 1980s and 1990s, the number of students pursuing education at the two-year degree granting institutions was well-below national averages. In fact, Montana ranked near the bottom for percentage of students beginning their post-secondary education at two-year colleges.

In the mid-2000s, new policies aimed at improving system performance at all two-year and four-year colleges within the MUS were proposed by leadership at the Office of the Commissioner of Higher Education (OCHE). The General Education Transfer Policy created three procedures to improve state system performance for general education programs (Montana Board of Regents, 2005). These procedures: stated that students who have completed lower division coursework in an approved general education program at any institution will not be required to take additional lower-division general education coursework at another institution; established a system-wide transferable general education core of courses; and recognized students conferred with the associate of arts or associate of science degree as having completed of all lower division general education requirements. The MUS Common Course Number Policy sought to further improve systemic performance through transferable coursework. It mandated a statewide catalog of faculty governed undergraduate course equivalencies based upon common learning objectives. The system created singular statewide discipline rubrics with associated common course numbers (Montana Board of Regents, 2007).

The Operational Guidelines for Dual Enrollment provided a partnership model between secondary education and the two-year colleges for providing college coursework to students while still attending high school (Montana University System, n.d.). Leadership efforts in implementing the dual-enrollment partnership bridged the gap between secondary and post-secondary education systems. It established a bridge for students navigating the 12th grade and 13th grade envisioned by Koos' 6-4-4 plan (1944), broadening opportunities for students to pursue higher education.

Perhaps the most comprehensive effort to transform the role of two-year colleges in Montana was the College!Now Initiative (Montana University System, n.d.). It sought to

improve the underutilization of Montana's two-year college system through implementation of new policy and enhanced awareness. It charged all two-year colleges with the expansive community college mission including career-technical education, transfer education, and developmental education with a focus on low-tuition costs. The College!Now (Montana University System, n.d.) initiative altered the mission for Montana's two-year colleges seeking to improve systemic performance of the two-year college system using policy, communication, and marketing.

Plotting the course for higher education in Montana.

Following the reorganization of higher education in Montana during the late 1980s and 1990s, Dr. Jeff Baker, Commissioner of Higher Education, noted the changes to come in higher education due to the demands of the information age. According to Baker (1995), the future issues facing the Montana University System would be: an increased financial burden on students in funding their own education; the elevated need for ongoing or lifelong learning for all citizens; reliance on new technology-based educational delivery systems; future job markets requiring more individuals to possess post-secondary degrees; strategic and incremental budgeting allowing flexibility to respond to student needs; and a focus for faculty to connect good teaching practices and scholarship. These prophetic issues described by Commissioner Baker remain today as challenges for the current leaders in higher education.

The Comprehensive Mission

The comprehensive community college mission is expansive involving four distinct functions: transfer education, career-technical education, developmental education, and community and continuing education (Cohen & Brawer, 2003). In conducting a study of transfer student baccalaureate time-to-degree, literature describing the comprehensive institutional

mission is an important component for examining the subject in the larger context of a complex social system. This section of the review will examine the community college mission. It will present literature conceptualizing the mission of community college and the various functions of the comprehensive mission including: open access and the role of developmental education in supporting all citizens; career-technical education and workforce development; and community and continuing adult education. Lastly it will discuss the financial resources available to the community college in conducting its mission and describe the important mission attribute of affordable higher education. An expansive review of literature related to the mission function of transfer education will be examined in a subsequent section.

Dougherty and Townsend conceptual model.

The Dougherty and Townsend (2006) model of determination provides a theoretical framework for analyzing the mission of community colleges. According to these authors, missions are determined through three distinct measures: public statements, programmatic offerings, and effects. Public statements provide a public announcement stating the institution's purpose. For instance, the Montana University System (MUS) uses its public website for announcing the mission of two-year education at its twelve different campuses. This public announcement states that the mission of MUS two-year colleges is to provide "low cost entry points to higher education for students looking to eventually transfer to a four year college, earn an occupational degree or certificate, brush up on basic math and English skills, or just pursue a personal interest" (MUS, n.d.). The same website published a second public statement of the comprehensive two-year college mission "to provide a comprehensive, accessible, responsive, student-centered learning environment that facilitates and supports the achievement of individuals' professional and personal goals, and enhances the development of Montana's

citizens, communities and economy" (MUS, n.d.). Although these two statements are not contradictory, they do point out subtle differences in distinguishing the two-year college mission from the comprehensive two-year college mission.

According to Dougherty and Townsend, questions and concerns about the community college mission have been a recurring and historic theme, pointing out that public statements only provide one metric in ascertaining the true mission of community colleges. Dougherty and Townsend point to programmatic offerings and effects of community colleges as two other equally relevant approaches for understanding mission.

Dougherty and Townsend (2006) describe the importance of studying effects of the community college as these measures tend "to draw out the overt and covert intentions and intended and unintended (but systemic) outcomes" (p. 7). Critics of two-year colleges point to effects such as poor student retention, low rates of student degree attainment, and limited numbers of student transfer as systematic results. These unintended outcomes are covert and more difficult to identify.

This study will use the Dougherty and Townsend approach to examine arguments supporting either the democratization effect or the diversion effect of two-year colleges. The public statement above supports the argument that two-year colleges create a democratization effect, by providing a pathway for students who otherwise would not have access to higher education, while the effects of the mission statement may give credence to support the diversion effect contending that programming offered at two-year colleges divert students away from four-year colleges and their true goal of obtaining the baccalaureate degree. It is in this stance that one finds contradiction between the three approaches of public statements, programmatic offerings, and effects of community college in determining the two-year college mission.

Conceptualizing mission.

An organization's mission statement provides a broad description of its purpose and meaning for existence, while relating the institutional core values (Matthews & Crow, 2010). "When systematically and comprehensively developed, a firm's mission statement can serve as an invaluable tool in directing the formulation and implementation of strategy" (Pearce, 1982). A mission endures the test of time, while a vision continually grows and changes, yet the two are closely related in that the "mission provides a basis for creating the vision" (Matthews & Crow, 2010, p. 158). The characteristics of a vision include broad appeal, dealing with change, encouraging faith and hope, reflecting high ideals, and defining destination and journey (Daft, 2014). "Vision is a specific destination, a picture of the future" (Senge, 2006, p. 138). "Mission statements define an institution's purpose while serving as the focal point for strategic planning and marketing functions" (Hegeman, Gray Davies, & Banning, 2007, p. 130). In conceptualizing the role of the two-year college, examination of mission and vision provide further insights into the institution's purpose and meaning for existence. Visions provide a lens to contextualize the direction of current leadership's actions and initiatives in steering the institution.

Vaughan (2006) defines the general mission for all two-year colleges as providing "access to postsecondary educational programs that lead to stronger, more vital communities" (p. 3). While Vaughan's definition is broad and general, Dougherty and Townsend (2006) further delineate two year college missions by stating, "the rules and procedures community college and state officials use to make decisions about curriculum, student advising, and faculty hiring, and to assess the performance of community colleges" (p. 5). In either case, Dougherty and Townsend note that the broad-based nature of two-year college mission statements could lead to

confusion and competing interests as to what the true purpose and identity is for these institutions. These broad mission statements pull these institutions in multiple directions.

Programmatic offerings and curricular function provides a method for describing the various roles community colleges assume (Cohen & Brawer, 2003; Vaughan, 2006). Curricula is one method of connecting institutional roles and mission function for two-year colleges (Dougherty & Townsend, 2006). The curricular functions of academic transfer and general education, vocational-technical education, developmental education, and continuing education and community service encapsulate the varying responsibilities of two-year colleges (Cohen & Brawer, 2003; Meier, 2013; Vaughan, 2006). These curricular functions define the comprehensive mission for the community college (Bragg, 2009).

These authors credit curricular function with the various titles given to two-year colleges. Institutional names, such as junior college, technical college, and community college have all been formally and informally assigned to institutions based upon their curricular and degree offerings (Cohen & Brawer, 2003). Institutions identified as junior colleges offer the first two years of the baccalaureate degree, while technical colleges offer career and technical training, Cohen and Brawer (2003) define the community college as “any institution regionally accredited to award the associate in arts or the associate in science as its highest degree” (p. 5), but acknowledge that this definition of community college eliminates some publicly supported institutions offering career-technical education.

Vaughan (2006) delineates comprehensiveness as an important commitment in stating the community college mission programmatic efforts. Open access means providing developmental education programming to underprepared students. Community based programming serves regional needs including career technical, recreational, social, and cultural education needs. The

mission of the community college is based upon open access for all citizens, comprehensive programming, commitment to the community, devotion to teaching and learning, and the fostering of life-long learning (Vaughan, 2006).

In examining mission documents from over 100 community colleges in the Southern United States, Ayers (2002) reports access, workforce and economic development, comprehensive programming, quality and excellence, and responsiveness to needs specified service areas as the five most frequent themes of organizational mission. “Access”, was the most frequent term, including statements referring to open-admission and open-door policies, while “workforce” and “economic development” and “comprehensive” were tied as the next frequently accessed phrases.

“Understanding the historical context is essential for demystifying the community college mission and the discourse surrounding it” (Meier, 2013, p. 3). The mission of the community college continues to change over time (Bragg, 2009). Ayers (2015) compared community college mission statements noting longitudinal change in three areas of discourse: credentialing structures, pedagogies, and practices. In examining credentialing structures, Ayers found enhanced emphasis on degree completion and lesser emphasis on keywords involving “occupational”, “vocational”, and “two”. The keyword “two” was identified as a shift in associate time-to-degree. It was thought to recognize the large populations of students requiring more than two years to complete the degree. These students are challenged in balancing academic responsibilities with work and family commitments resulting in part-time and noncontiguous enrollment patterns. Ayers describes pedagogy in reference to changes taking place in optimal learning environments, transformative experiences and close relationships with peers and teachers. Practice reflected terms involving change in teaching practices such as

“distance” and “multiple”; “research” and “institution”; “student”; and “sustainability”. Online learning was suggested a change in pedagogy which enhanced student access to education. “Research” was seen to represent the use of data in decision making and a change in faculty scholarship efforts. “Student” was interpreted to mean student-centered teaching and institutional practices. “Sustainability” was perceived as a recognition of environmental issues and potential financial constraints associated with maintaining a viable institution. Ayers’ comprehensive examination included comparisons of mission statements from over one thousand institutions in 2012-2013 with 453 institutions from 2004.

In rural areas, the expansive community college mission is typically thrust onto institutions based upon need (Cavan, 1995). Their regional location makes these community colleges the primary educational resource for citizens. Cavan (1995) notes that rural community colleges need to be the hub for economic development, cultural enrichment, and transfer education. The mission at rural community colleges must be accounted for all things and to all people.

Lake and Mrozinski (2011) made the case that the mission for community college is well understood and there is no need to restate it, noting that the resources to develop and maintain mission statements is significant. Mission statements serve three purposes for community colleges: goal clarification, marketing, and accreditation. Comparing mission statements from community colleges, these authors identify a conflicted reality describing a priori roles for developing a mission statement such as clarifying goals, a “smokescreen for opportunism” (2011, p. 8), description of things as they are, future aspirations, and as a marketing tool. Accreditation requires development of the mission statement, but emerging from the process is the opportunity for team-building within the organization’s leadership group.

Levin (2000) identified curricular function, institutional purpose, and educational training as three distinct tracks for developing an institutional mission. Levin contends that the community college mission was altered in the 1990s in response to the global economy favoring workforce preparation for the knowledge-based economy instead of individual development. In a study of community colleges in the Pacific-West, Levin found the mission of these institutions to remain unchanged, yet the behaviors and actions of these organizations changed by adopting new behavior supportive of a global economy. Levin described these behaviors to be highly associated with productivity and efficiency. These researchers also observed diversity and multiculturalism in hiring practices, curriculum, and extra-curricular activities.

One of the challenges for community colleges will be determining what will be the correct combination of mission foci in consideration of the social, political, and economic state of the twenty-first century (McPhail & McPhail, 2006). In acknowledging the broad impact of the comprehensive community college mission, these authors provide a framework for prioritization of resources based upon institutional mission.

Mendoza et al. (2009) assembled a focus group of trustees, community college presidents, administrators and faculty from community colleges across the Nation. In the findings of this focus group, the values, actions, and mission determined by the group for the community college were: community and historic community college core values; accessibility for students; benefits of post-secondary education (“Education = Hope”); student success and pride; return on investment as measured by students and community; and communications with constituents. Student-centeredness marked the positive climate of the focus group as reflected in the humanitarian equation “Education = Hope” exemplified in the finding benefits of post-secondary education.

Developmental education & open access.

The admissions requirements for attending the four-year college has posed an obstacle for academically underprepared citizens (Cohen & Brawer, 2003). The open admission policies at community colleges serve as a portal for access to higher education for all citizens. According to Vaughan (2006), “open access to higher education, as practiced by the community college, is a manifestation of the belief that a democracy can thrive, indeed survive, only if people are educated to their fullest potential” (p. 4).

Community college admissions policies have been misunderstood, particularly in the context that open access refers to admission to all programs of study regardless of student academic preparation (Vaughan, 2006). Open access refers to open student admission to the institution where the developmental coursework needed to enter the program of study is provided. Cohen & Brawer (2003) interchangeably used the terms developmental and remedial as descriptors for those courses that teach basic literacy in reading, writing, and mathematics. Developmental education continues to be an important aspect of the community college mission as evidenced by curricular functions and public statements of mission (Bailey & Morest, 2004; Cohen & Brawer, 2003; Dougherty & Townsend, 2006; Vaughan, 2006). Open access requires the community college to offer basic literacy programs which are essential in constructing a foundation for providing all citizens an opportunity to pursue higher education (Cohen & Brawer, 2003). Institutions administer diagnostic exams to assess competency and basic literacy. The results of these assessments are helpful in identifying students who need developmental coursework and serve as gateways to college-level coursework. While open access policies allow all citizens an entry point for higher education, programmatic and specific course pre-requisites may require completion of developmental education potentially extending a student’s time-to-

degree, yet studies involving the impact of developmental education on baccalaureate degree completion are inconclusive (Monaghan & Attewell, 2015).

In addition to academic preparation for college learning, Vaughan (2006) described geographic proximity to a college campus as an additional access issue. According to Vaughan, access means the location of a community college is within commuting distance for all citizens. States responded to the need for higher education by organizing services and establishing public community colleges in remote regions. In the twenty-first century, technology has altered the meaning of geographic proximity in accessing higher education. Ayers (2002) reported that the seemingly endless educational opportunities online have altered the demand for higher education based solely on geographic proximity. Yet the digital divide requires access and knowledge to leverage technology stressing the need for basic literacy particularly among individuals from the socio-economic groups served by the community college (Picciano, 2011). Understanding technology requires a certain level of basic literacy prior to successful engagement in online learning.

The open access function of the community mission continues to be an important aspect in serving all citizens of the country. Enrollment policies for open access require developmental education programs for students. Additionally, proximity within commuting distance remains a relevant aspect in delivering higher education to remote regions.

Career-technical education.

Workforce development is an important focus of the comprehensive community college mission. Friedel (2008) described workforce development as a priority for our nation having stated that over sixty percent of students in community colleges pursue occupational courses of study (Jacobs & Dougherty, 2006).

Community colleges have become a significant factor in local workforce development by taking advantage of institutional strengths such as organizational flexibility, close proximity to private-sector enterprises, low cost, technical expertise, and experience in teaching adult learners. (Jacobs & Dougherty, 2006, p. 53)

Cohen and Brawer (2003) stated the phrases: terminal, vocational, technical, semi-professional, occupational, and career are used as singular terms or in combinations to describe workforce development programs. With the reauthorization of the Perkins Act (2006), the US Department of Education categorized all workforce development programs as career-technical education (CTE).

CTE programs are established with the intention of preparing students to enter the job market or change careers. CTE is focused on employment and in some fields includes industry certification and professional licensure (Cohen & Brawer, 2003). CTE programs establish advisory committees of employers with the intention of providing faculty input on the skills and training needed in the workforce. The close connectivity between faculty and employers helps students secure jobs (Cohen & Brawer, 2003).

The future of the comprehensive community college mission of workforce development is uncertain due to changes in employer demand, changes in state support, and the rise of private education entities (Jacobs & Dougherty, 2006). Jacobs and Dougherty (2006) found that more employers were demanding individuals possessing the baccalaureate degree rather than technical education. They recommended improving CTE by using integrated systems of workforce training that stretch from non-credit education to baccalaureate education connecting and laddering credentials for students. Wilhelms (2001) found that support short-term, workforce training in the form of certificate programs serve as a ladder approach for lifelong learners to

further their education. Additionally many community colleges are now seen to offer baccalaureate degree programs in career-oriented fields (Vaughan, 2006).

Some CTE programs are characterized as terminal when credited courses for the degree are not transferrable to baccalaureate degree institutions. Cohen and Brawer (2003) reported variability among students from CTE programs attempting to transfer credits to four-year institutions and stated that success varied based upon the field of study and the transfer institution with lesser success seen among liberal arts colleges. The need for soft skills in all fields in the workplace have energized general education coursework in all CTE programs, thus blurring the lines of CTE and transfer education programs (Cohen & Brawer, 2003). These authors questioned the logic of the dual-track system of CTE and transfer education suggesting it to be outdated model. Palmer (1987) hypothesized that separate curricular tracks have developed as a result of political, terminal, and economic agendas. Accordingly to Palmer, in the political agenda, the primary purpose of two-year CTE education is to serve students by providing the skills necessary to enter the workforce. In the terminal agenda, two-year colleges are only meant to serve those students of lesser academic ability than students at four-year institutions. In the economic agenda, the role of two-year colleges is to serve the local economy by developing the skilled workforce to support regional industry. Cohen and Brawer (2003) augment Palmer by suggesting a fourth agenda described as the hidden agenda in which separate tracks have been created to channel low-income and minority students away from academic studies. The hidden agenda seeks to thwart the upward social mobility of these students.

Authors express the importance of integrating the foci of the comprehensive community college mission (Bragg, 2001). Integrating career-technical and academic curriculum is beneficial to citizens and society in the information age (Badway & Grubb, 1997).

Contextualizing the multiple missions involving developmental education, transfer education, and career-technical education provides an understanding and relevance to the education experience of students (Bragg, 2001).

Community and continuing adult education.

The Truman Commission (1947) recommended community colleges serve as centers for adult education (Gilbert & Heller, 2013). Cohen and Brawer (2003) describe continuing education and community service as distinct curricular functions, but these authors broadly describe both as the community education function of the comprehensive community college. According to Cohen and Brawer (2003), the focus of community education is broad as it involves adult education, contract services, and continuing education with varying duration and models involving credit and non-credit options. The programs are typically funded through non-tuition related fees, grants, and contracts. They may be open to the entire community or segregated to an individual professional or organization.

Some community education activities provided by community college are strictly for cultural or recreational enjoyment. An important role of the college is as the cultural hub for many communities particularly in areas where they might be the only higher education institution in regional proximity (Cohen & Brawer, 2003). Vaughan (2006) describes these programs as overlapping with other college mission functions including CTE and transfer education.

Financial support.

Allocation of resources for implementing and sustaining the comprehensive mission continues to be a critical issue for community colleges. Cohen and Brawer (2003) stated, “institutions that enroll half the people who begin higher education can no longer be considered

merely alternatives for students who do not wish to leave their home town to go to a university” (p. 141). Public resources devoted to implementing the community college mission come from a combination of federal, state, and local funding which have varied by percentages of contribution over time (Cohen and Brawer, 2003). Community college support has seen a remarkable shift away from local funding with a higher reliance on state funding, at the same time a notable trend has seen reductions in overall public funding and increased reliance on student tuition (Tollefson, 2009).

Institutions have attempted to control expenses for supplies and equipment, yet it is human resources which account for the largest expenditures in the community college budget. As a labor intensive industry, strategies meant to improve efficiency have been implemented in community college budgets. Leaders have decreased student services, increased class sizes, cancelled low enrolled classes, encouraged early retirement for faculty and staff, and have become reliant on hourly-rate, adjunct faculty (Cohen & Brawer, 2003). At the same time, new directives requiring enhanced performance are being implemented to ensure greater accountability for student retention and completion. Performance-based funding measures are the new norm in many states (Askin, 2007; Tollefson, 2009; Wiggs, 1987).

While the mission of the community college remains expansive, we continue to devote less attention to the resources needed to sustain the activities associated with it. Cohen and Brawer (2003) cites the examples in developmental education, career technical education, and reduced tuition prices in connecting resources with mission. Students are expected to be proficient in basic skills prior to engaging in college-level courses, but without a contiguous system such as the 6-4-4 plan (Koos, 1944), there is no efficiency or accountability measures in the current secondary funding system to ensure completion. Open access is a core value in the

community college system yet limited resources are devoted to supporting development educational services.

While low tuition rates are valued at all community colleges (Tollefson, 2009), financial aid is more readily available to support the student demographic served by the community college. Raising tuition can be seen as a measure to enhance federal funding as a resource for the community college (Cohen & Brawer, 2003). Career technical programs of study requiring intensive lab, apprenticeship, clinical, and shop models of education do not lend themselves to the efficiencies found in the traditional classroom model. The resources to support the mission of career technical education has never been directly connected to the benefit of economic development and the specific industries hiring this workforce pool of skilled individuals.

In addressing resource allocation, Askin (2007) noted the importance of local funding in supporting the complex mission in providing both CTE and transfer education. According to Askin (2007), if the accomplishments of the community college are to be evaluated using the metrics of senior level institutions and those of local citizenry, then resource allocation should come from both state and local level through a dual-funding model. The dual-funded system is based upon the findings that:

Dual-funded colleges provide services to larger numbers of students, both in total and as a percentage of the population, and enroll higher percentages of part-timers. Dual-funded colleges charge lower tuition rates for local residents and offer institutional financial aid to more students. Dual-funded colleges offer a wider array of programs and have a higher probability of offering occupational, remedial, and recreational programs. Dual-funded colleges award fewer degrees per FTE and have lower graduation rates than state-funded colleges. (Askin, 2007, p. 995)

These findings mark a return to the roots of the early junior college funded as extensions of local high schools gaining state support as these institutions grew and evolved (Tollefson, 2009). Wiggs (1987) described the dual-funding model for resource allocation as problematic, blaming the North Carolina legislature as it “unnecessarily vacillates between channeling authority through the state agency and channeling it through directed support to local constituencies” (p. 26). He described tension between the comprehensive community college mission and accountability to the legislature.

Community colleges continue to be challenged in finding the resources necessary to implement the many facets of its comprehensive mission (Tollefson, 2009). Nespoli (1984) described the ever evolving nature of the mission based upon political and educational policy makers at the local, state, and national levels. Nespoli conceded that funding for resource allocation are likely not to change, leaving two options for continuing the comprehensive mission. Either state-level policy makers will need to become convinced of the value community college programs bring to local communities or the mission of the community college will need to change in a drastic fashion.

Affordability.

An important attribute of the community college mission is to provide affordable higher education to all citizens (Montana University System, n.d.). Ma and Baum (2015) found the tuition costs of attending the community college was approximately one-third (37%) the cost of tuition at four-year campuses. The regional proximity of community college campuses can provide additional savings to families by allowing traditional students to live at home with parents, while attending the first two-years of college (Ward & Wolf-Wendel, 1989). Other affordability initiatives continue to surface, such as making the first two years of higher

education tuition free through community college courses as described in President Barack Obama's State of the Union Address (2015).

Long and Kurlaender (2009) credit Becker's human capital model (1964) as rationale for students choosing the community college over the four-year institution. Human capital theory makes the assumption that individuals will pursue activities, such as education, with the expectation that it will result in some future benefits (Eide & Showalter, 2010). Provided the monetary rewards for the student are the same whether beginning at the community college or the four-year college, the savvy student will begin at the community college as its affordability makes it a better financial investment.

Several studies have been examining student financial assistance and incentives have been conducted. Community college enrollment, transfer rates and baccalaureate degree completion increased when students were provided tuition deduction incentives (Denning, 2015). Long (2007) reported financial aid provided a positive effect on community college enrollment, while higher tuition rates led to lower enrollment.

Policy makers are advocating for greater use of the transfer function of the community college as a solution to the rising costs of higher education (Wellman, 2002), while researchers are recommending further study and caution prior to implementing significant change. The overall economic benefit of lower tuition rates at the community could be minimal or even prove to be more expensive for the individual if the baccalaureate time-to-degree is longer for the transfer student than the non-transfer student.

Summarizing the comprehensive mission.

The multiple and divergent functions of the comprehensive community college mission create a high expectation that these institutions provide all forms of education for the diverse

population of citizens in communities they serve (McPhail & McPhail, 2006). The comprehensive mission claims to provide open access to regionally-based, post-secondary: transfer, career-technical, developmental, and community development and continuing education (Cohen & Brawer, 2003; Vaughan, 2006). Dougherty and Townsend's (2006) theoretical framework consisting of public statements, programmatic offerings, and effect provide a measure in determining the real community college mission. Economic, social, and political forces will continue to shape the mission and pose the challenge of prioritizing resources for these institutions (McPhail & McPhail, 2006). "Perhaps the most reasonable resolution to the ongoing mission debate is to recognize that colleges will continue to evolve into even more complex institutions serving a diverse set of constituencies and carrying out a large variety of activities" (Bailey, 2002, p. 48), noting the importance of undertaking missions which complement rather than compete with one another and the needs of the community.

The Community College Culture

"The specific culture of the institution is simultaneously part of, and contributes to, the culture of the social order in which it is embedded" (Thelen & Getzels, 1957). The community college culture is an integral component of the educational system for the transfer student. Perhaps the most important aspect of the community college is that it serves all citizens, regardless of socio-economic status, as the principal entry point or portal to higher education for all. Understanding the culture of the two-year college, its students, the institution, and its emphasis on teaching and learning are critical pieces in examining baccalaureate time-to-degree. Like other education institutions, community colleges are complex social systems which are purposive, peopled, structural, normative, and sanction-bearing (Getzels & Guba, 1957). The purpose and structure of the community college as an institution was examined in an earlier

section of the review in the context of mission. According to Getzels and Guba (1957), “if institutions are to carry out their prescribed goals, human agents are required” (p. 425). In examining time-to-degree from a systems approach, an understanding of the people and norms of behavior for the community college is essential. Northouse (2013) defined culture as “the learned beliefs, values, rules, norms, symbols and traditions that are common to a group of people. It is these shared qualities of a group that make them unique. Culture is dynamic and transmitted to others” (p. 384).

The culture of the community college is different from four-year college campuses (Cohen & Brawer, 2003; Ma & Baum, 2015). This section shifts the literature review from institutional characteristics to an examination of the people it serves. The culture of the community college student is an essential component of the social order in transfer education. Noting the cultural attributes of these students reveal factors influencing baccalaureate time-to-degree.

Cohen and Brawer (2013) described number and variety as the distinguishing characteristics of community college students. Number referring to the continued increase in enrollment: 1960 – 500,000; 1970 – 2 million; 1980 – 4 million; 2000 – 5.7 million; and 2010 – 7.9 million, while variety describes the large proportion of minority, first generation, low-income, and adult students (Ma & Baum, 2015). Community colleges are expected to continue experiencing record-breaking enrollment numbers as the Nation continues to promote post-secondary education for all citizens. According to the National Center for Education Statistics, college enrollment is expected to increase by 14 percent during the period 2013-2024 (Snyder, de Brey, & Dillow, 2016). Nationally, the average cost of tuition at two-year colleges is approximately one-third (37%) the cost of tuition at four-year campuses (Ma & Baum, 2015). Regional proximity of campus locations, affordability, and open access policies make the

community college accessible to all citizens. They assume a role as the gateway to post-secondary education for citizens from all walks of life.

Minority and socioeconomic Status.

The community college serves disproportionately larger numbers of minority and economically disadvantaged students. Minority and economically disadvantaged students were more likely than white students to begin their education at a community college (Jepsen, 2008; Jepsen, Troske, & Coomes, 2014). These authors concluded that community colleges have the greatest potential to reduce economic inequalities. Bailey, Jenkins, and Leinbach (2005) found race, household income, and parents' level of education to be attributes that stratified enrollment at postsecondary institutions with disproportionate numbers of these groups being represented in community colleges. Economically disadvantaged students are more concentrated at community colleges, while students from higher socioeconomic families attend highly selective schools leading to an effect known as institutional stratification (Bastedo & Jaquette, 2011). These authors found that institutional stratification has a negative effect on baccalaureate degree attainment for economically disadvantaged and minority students. Institutional stratification marginalizes students choosing the community college (Joshi, Beck, & Nsiah, 2009). Calcagno et al. (2008) found that colleges with a larger share of minority students have lower graduation rates and students with adequate economic resources are more successful, yet student financial aid does not have a strong effect on student graduation. Community college students were found to work longer hours at jobs outside of school, and come from lower income family backgrounds (Joshi et al., 2009). These factors contribute to student success in completing the baccalaureate degree.

Students who are the first members from their family to attend college are known as “first-generation college students” (Chen & Carroll, 2005, p.iii). These individuals are more likely to begin their education at a community college. They are more likely to experience delayed entry following high school graduation and attend part-time with discontinuous enrollment patterns. They come from low-income families and are more likely to be minorities (Chen & Carroll, 2005; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996). First-generation college students trail other students in credits earned over time and show a preference for CTE courses over academic courses (Chen & Carroll, 2005). Their academic performance, as measured by GPA, is lower than peers and the need for developmental education courses is higher. It is more difficult for this student cohort to choose an undergraduate major (Chen & Carroll, 2005).

First-generation college students are less likely to complete the baccalaureate degree and those that do are likely to take more time (Chen & Carroll, 2005; Terenzini et al., 1996). These students have different psychological needs than their peers and may lack self-confidence (Inman & Mayes, 1999). Among successful first generation college students, nonacademic skills developed through life experiences were seen as critical for success (Byrd & MacDonald, 2005). Byrd and MacDonald (2005) linked student skills in self-advocacy and time management to academic achievement, thus favoring older and more experienced first generation college students. The greatest need for remedial education among these students was in the area of reading.

The diverse culture of the community college provides a nurturing environment to first-generation college students (Inman & Mayes, 1999). Terenzini et al. (1996) recommended assisting first generation college students by easing the transition from secondary to post-secondary education systems. Early college initiatives such as dual-enrollment courses have been

proposed as one mechanism to assist students in making the transition from high school to college (Karp & Hughes, 2008; Kisker, 2006). Dual-enrollment programs allow students to complete college coursework while enrolled in high school (Marken, Gray, & Lewis, 2013). Early college programs are partnerships between secondary and post-secondary education institutions, designed to allow students underrepresented in higher education the opportunity to earn college credentials, including the baccalaureate degree (Hoffman, Vargas, & Santos, 2009). Early college experiences have been shown to build confidence in the academic abilities of all students (Born, 2006). In many states, such as Montana, dual-enrollment courses are delivered through local two-year colleges, further enhancing the connection between secondary education and the two-year college system (Montana University System, n.d.).

Nontraditional and adult learners.

In addition to minority, economically disadvantaged, and first generation college students, community college campuses serve nontraditional students, part-time students, commuter students, and academically challenged students. When compared with four-year college peers, higher ratios of these diverse student groups attend community college campuses (Cohen & Brawer, 2003). Bailey et al. (2005) credit community colleges as being the “most representative cross-section of the American population” (p. 58).

Although typically associated with age, the term nontraditional is used as an umbrella for describing a number of other special student characteristics and responsibilities (US Department of Education-NCES, n.d.). Bean and Metzner (1985) define the nontraditional student as being older than 24, or does not live in a campus residence (e.g., is a commuter), or is a part-time student, or some combination of these three factors; is not greatly influenced by the social

environment of the institution; and is chiefly concerned with the institution's academic offerings (especially courses, certification, and degrees) (p. 489).

Unlike traditional students, nontraditional students may have other responsibilities competing with their educational attainment, such as supporting children and families. Nontraditional students are more likely to be financially independent and may be required to work in addition to attending college to support dependents and family members. Nontraditional students are more likely to attend college on a part-time basis. Patterns of part-time and noncontiguous enrollment impact persistence, degree completion, and time to degree completion (US Department of Education-NCES, n.d.). Alfonso (2006) reported that community college students are more likely to attend part-time and experience interruptions in enrollment. Nontraditional students experience gaps between secondary school completion and enrollment into higher education. These factors pose confounding variables for studies involving baccalaureate time-to-degree (Alfonso, 2006), yet most studies have indicated that nontraditional students are less likely to complete a degree than traditional students (Bean & Metzner, 1985).

As adult learners, nontraditional students have different learning needs and learner attributes. Knowles (1970) coined the term andragogy in describing the method and practice of teaching adult learners. According to Knowles (1970), adult learners are self-directed, possess expansive reservoirs of prior knowledge, need to solve real problems, are performance oriented seeking to immediately apply what they learn, and are intrinsically motivated. Knowles noted that the past experiences and needs of adult learners serve as a unique learning resource for educators and shape the culture of the community college classroom. Two-year college campuses have more adult learners than 4-year college campuses (US Department of Education-NCES, n.d.).

Commuter students.

Although the sheer volume and availability of two-year campuses across the country provide access through regional proximity, many community colleges do not provide student housing. Stewart and Rue (1983) describe the commuter as a student who does not live in institutional-owned housing. A distinguishing difference in the community college from four-year campuses is higher numbers of commuter students. The commuter student arrives to campus using all forms of transportation including bicycles, buses, and automobiles (ASHE, 1989). The time and distance of the commute can be short or long. Commuter students represent approximately eighty percent of the total undergraduates in higher education (Stewart & Rue, 1983).

Tinto's (1987) theory of social integration postulates that as a student integrates into the social environment and the academic values of the institution, a commitment to the institution is developed, thus promoting persistence and eventual degree completion. Students living on campus are more engaged in social and academic activities than commuter students, but nontraditional students are viewed to be more mature and less dependent on the social integration than traditional students (Kuh, Gonyea, & Palmer, 2001). Academic integration looms as a larger issue for commuter students. The part-time and inconsistent enrollment pattern of nontraditional students can lead to decreased contact time with faculty. It is the reduced opportunities for academic integration experiences that are of primary concern at community colleges (Bean & Metzner, 1985). With a dominant population of commuter students at all community colleges, commuting and proximity to campus can create negative ramifications for student retention and degree completion in both traditional and nontraditional students.

Academic preparedness.

Four-year colleges practice academic selectivity using it as a requirement for admission, while community colleges operate as open access institutions accepting all students regardless of academic preparedness. Past academic success and adequate academic preparation has been established as an important student success factor in persistence, completion, and time-to-degree. Community college students enter college with a lower-level of academic performance than four-year college students (Joshi et al., 2009).

The developmental education function of the community college comprehensive mission establishes a support mechanism to assist students in developing the necessary skills in mathematics, reading, and writing in becoming college-ready, but academically underprepared students are less likely to complete the baccalaureate degree and those that do take longer. The Center for Community College Student Engagement (2016) reported that 68% of all community college students require some developmental education. Developmental coursework can extend time-to-degree for students by requiring additional courses and semesters of attendance. Kuh et al. (2006) described the lack of an integrated approach between secondary and post-secondary institutions as a hindrance for students preparing for college-level academics. Despite the widespread need for developmental education, limited research has been completed on its effect on retention and completion (Monaghan & Attewell, 2015).

In a longitudinal study comparing community college students with non-transfer students, Monaghan and Attewell (2015) found little difference in the academic performance during a student's first two years of study, but in subsequent years, disparity was seen in the progress of community college students due to involvement in other activities, such as employment. They concluded that these factors led to a greater likelihood of dropout.

Student selectivity.

It is commonly thought that students choose to begin their baccalaureate education at the community college due to its low cost, open enrollment policies, and convenient geographic location, but these inferences fail to consider why students with higher levels of academic ability and financial means choose to begin their journey at a community college campus rather than a four-year campus (Townsend & Wilson, 2006). Townsend and Wilson (2006) speculate that the community college is a fertile place for the traditional student to begin exploring higher education. When faced with a parental mandate to attend college, community colleges provide a safe haven for individuals deciding whether seeking a college degree is what they want to do and whether they have the aptitude to succeed. Some students choose to begin baccalaureate degree work at the community colleges due to the nurturing learning environment. While the majority of faculty members on four-year campuses have significant research responsibilities which can diminish the importance of teaching responsibilities, the primary focus of faculty members at community colleges is teaching and learning (Vaughan, 2006). Smaller class sizes delivered on smaller campuses create a learning atmosphere preferable among many students (Townsend & Wilson, 2006). Less supportive environments may impede the ability of these students to succeed academically in what Calgano et al. (2008) refer to as the unobserved institutional factors such as college leadership, faculty relations, and political environment. Alfonso (2006) describes the importance of not overlooking the unobservable characteristics associated with student self-selection for studies involving baccalaureate completion and time-to-degree.

Shamsuddin (2016) described the undermatching effect as the differentiation between student ability and institutional selectivity. Students from low socioeconomic status (SES) groups choose to attend less selective colleges. The undermatching theory suggests that

academically high achieving students from economically disadvantaged students enroll at less competitive colleges. These less selective institutions have lower graduation rates and fewer resources to support students, therefore these students would be better served by enrolling in a more selective institutions (Shamsuddin, 2016). The undermatching effect finds that students from low SES families are more likely to attend less selective institutions despite the evidence that less selective institutions have lower rates of student graduation (Bastedo & Jaquette, 2014). These researchers hypothesize that academically well-prepared students would benefit by attending selective institutions instead of the community college as statistically it would increase the probability of graduation (Melguizo, 2008)

At the time of secondary school completion, some students might not meet the requirements to attend a selective university, but following community college attendance earn the opportunity to attend higher quality universities. Hilmer (1997) found that students who begin their education at community colleges are able to transfer into higher quality universities. According to Hilmer's study of the *High School and Beyond* survey from the National Center for Education Research Student, students from economically disadvantaged families, low academic ability, or poor high school performance were able to transfer and attend universities that were up to 75 Scholastic Assessment Test (SAT) points higher following attendance at a community college. Hilmer concludes that community college attendance has a positive effect on the future of students from low income, low ability, or low high school performance. Doyle (2009) found that those students choosing to begin academic careers at community colleges choose higher quality universities upon transfer. The largest quality increases are seen in students from lower socio-economic family demographics and lower academic abilities. Doyle also concludes that a negative relationship exists between community college attendance and baccalaureate degree

completion following non-parametric propensity score matching. Doyle encouraged caution as his findings arrived at the same conclusion of other studies which indicate that policy shifting enrollment to community colleges could impact student time-to-degree.

In analyzing student use of the community college, Bahr (2011) developed a typology consisting of six major clusters of first-time students: drop-in, experimental, noncredit, vocational, transfer, and exploratory. Students in the transfer cluster were characterized by attending full-time with the highest course loads of any cluster; completing the greatest number of math, English and science courses; and remaining in the system longer than other students. In the typology, Bahr (2011) found students in the exploratory cluster and the transfer cluster possessed many similarities and connected the two clusters as a continuum, finding that students from both clusters self-reported similar goals. One notable difference between these two groups of the Bahr typology was that exploratory cluster students were found to experience less success in completing coursework than transfer cluster students (Bahr, 2011) indicating that self-reported intentions were important to student success.

Summarizing the community college culture.

Community colleges are social systems (Thelen & Getzels, 1957) with a culture built around the unique attributes of the students they serve. Community colleges serve disproportionately higher numbers of minority students, economically disadvantaged students (Bailey, Jenkins, and Leinbach, 2005; Jepsen, Troske, & Coomes, 2014), nontraditional students (Bean & Metzner, 1985), academically underprepared students (Cohen, 2003), first generation college students (Inman & Mayes, 1999; Jepsen et al., 2014; Terenzini et al., 1996), and commuter students (Kuh et al., 2001; Stewart & Rue, 1983). The culture created by the cohort of students on community college campuses is different than the culture of the four-year college

campus. Community college students are more likely to attend part-time and experience interruptions in enrollment (Alfonso, 2006). The open access policies, affordability, and regional proximity to all citizens are thought to provide the primary draw in selecting community colleges (Cohen & Brawer, 2003), but students choose the community college over the four-year college campus due to the nurturing learning environment created by smaller class sizes, smaller campuses, and more individualized attention from faculty members whose primary focus is learning and teaching (Alfonso, 2006; Townsend, 2001). Institutional stratification of student populations continues to be a confounding variable for baccalaureate completion and time-to-degree research comparing community college transfer students with non-transfer students (Monaghan & Attewell, 2015).

The Transfer Function

The term “collegiate function” (Cohen & Brawer, 2003, p. 315) encompasses student flow between institutions and the curricular function of the liberal arts education. According to these authors, “one of the community college’s primary purpose has been to accept students from secondary school, provide them with general education and introductory collegiate studies, and send them on to senior institutions for baccalaureate” (p. 343). The first two-year colleges were known as junior colleges, a term which represents an early partnership with four-year colleges, where the first two years of the baccalaureate degree were offered at the junior college (Rudolph, 1990). The junior college and its transfer function formed the early roots of the community college.

Bahr, Toth, Thirolf, and Masse (2013) list a wide range of topics associated with student transfer from community college to four-year institutions. Central themes found in the system of student transfer include: (1) the accuracy of student self-reported academic goals; (2) the cooling

off or warming up effect of academic performance and student ambitions; (3) institutional support for transfer students by faculty and advisors; (4) external variables influencing the ability for the student to transfer from two-year to four-year institutions; (5) institutional articulation agreements and partnerships; (6) recruitment and support for transfer students at four-year institutions; (7) student academic preparation and performance; and (8) student experiences at the four-year institution (Bahr et al., 2013), yet the ultimate measure for success of the transfer student is completion of the baccalaureate degree. Successful transfer is not the goal, it is successful completion (Bahr et al., 2013).

When examining transfer education as a mission function, the literature primarily focused on the role of the community college with less attention devoted to the role of four-year colleges (Bahr et al., 2013), despite the ultimate responsibility for recruiting, transitioning, retaining and eventually graduating students lies with the four-year college (Aragon & Perez, 2006). Kinzer (1999) defined transfer as the “totality of processes and relationships involved in the movement of students vertically and laterally throughout the education system” (p. 148). The system of transfer is a complex web of relationships between educational institutions and when placed in the theoretical social systems context, exists like any other system in that it “is composed of interacting subparts, and the interaction is regulated as the system as a whole” (Thelen & Getzels, 1957, p. 343).

Two-year colleges develop public statements identifying the importance of the transfer function in their mission, while delivering the liberal arts curriculum to support this claim. These public statements and curricular functions provide two overt metrics for measuring mission as described by the Dougherty and Townsend theoretic model of mission determination (2006). What is less evident is the model’s third metric involving community college effects. By using

effects in assessing the transfer function, we can observe “the overt and covert intentions and intended and unintended (but systemic) outcomes” (Dougherty & Townsend, 2006, p. 7).

This section will review literature associated with the effects of the transfer function. Although the transfer function of the community college is seen by its advocates as a force which enables the democratization of higher education by providing open access to affordable higher education within regional proximity for all citizens (Rouse, 1995, 1998; Leigh & Gill, 2003), its critics have stated that the effects of community college actually divert students from completing the baccalaureate degree (Brint & Karabel, 1989). It is the unintended effects and covert intentions which cause criticism in the transfer function of the comprehensive community college mission.

Democratization or diversion.

Nearly 70% of students entering community colleges explicitly stated that their educational objectives included completion of the baccalaureate degree (Brandburn, Hurst, & Peng, 2001). Brint and Karabel (1989) argued that despite the early focus of liberal arts curricula offered by the junior college and the intent of transfer to a senior college, the vocational-technical movement of the modern community college has diverted students away from the baccalaureate degree. Administrators, businesses, and political leaders have chosen CTE over traditional liberal arts education as a means for economic development aimed at creating a skilled workforce. Those students with intentions to pursue the baccalaureate degree upon enrollment at a four-year institution are influenced to attend the community college where they are diverted away from the liberal arts curriculum, choosing instead to pursue CTE based claims of higher economic benefit for the individual. Alfonso (2006) found that even when other factors, such as noncontiguous student enrollment patterns, student self-selection, and student

educational expectations have been controlled, community colleges do divert students by reducing the probability of baccalaureate degree completion. Pascarella and Terenzini (2005) found that attendance at a community college does decrease the likelihood of baccalaureate degree completion. These studies provide examples of the diversion effect where students enrolled in the community college do not complete the baccalaureate degree.

Rouse (1995) concluded that community colleges increased the educational attainment for others that might otherwise not have the opportunity to attend college. Rouse (1995) found the regional proximity of community colleges to be a positive factor to educational attainment. These conclusions support the democratization effect. She concluded that the community colleges increased time-to-degree, but did not change the likelihood of completing the baccalaureate degree. Furthermore, Rouse (1998) stated that cost does impact enrollment decisions in finding that the community college provided additional savings for the student. She concluded that the community college can improve access to higher education and educational attainment for citizens.

Leigh and Gill (2003) argue that the diversion effect cannot be properly measured as students self-reported goals for levels of schooling are confounding. Using data from the National Longitudinal Survey of Youth (NLSY), Leigh and Gill (2004) found the diversion effect of community colleges was minimal. In fact, the community college expanded the educational aspirations of students and provided confirmation that the community college provided a democratization effect (Leigh & Gill, 2004). They determined that community colleges increased educational attainment and provided a lower-cost alternative for achieving the baccalaureate degree. Additionally Leigh and Gill (2004) discovered an “incremental aspirations effect” (p. 95) in which initial student success increased the desire for additional education

attainment amongst students from disadvantaged family backgrounds. Leigh and Gill (2003) concluded that community colleges increased the overall educational attainment of students by 0.4 to 1.0 years. These results confirm the democratization effect of the community college, and provided a recommendation to policy makers to not be overly influenced by earlier studies describing the diversion effect.

Monaghan and Attewell (2015) found that although a student beginning their education at a community college might be less likely to complete the baccalaureate degree, most studies fail to examine confounding variables such as socioeconomic status. When socioeconomic status is controlled, the diversion effect is even non-existent when state-level characteristics involving transfer policy are eliminated in studies comparing the transfer student with the non-transfer student (Melguizo, 2008). Gonzalez and Hilmer (2006) found that two-year colleges have an “unambiguous positive effect on the educational attainment” for minority students. Furthermore, access to two-year colleges provided a disproportionate positive benefit to Hispanic populations. Their findings further support the claim that two-year colleges provide a democratization effect.

Other studies have found two-year colleges benefit all of society in connecting education with citizen engagement (Dee, 2004). Dee (2004) stated that education has a statistically significant and large effect on voter participation, support for free speech, and frequency of newspaper readership. In a study involving economically disadvantaged mothers at community colleges in Louisiana following Hurricane Katrina, Deterding (2015) found few women earned degrees, but the rate of re-enrollment and intentions to complete a college education remained high. Persistence in college was perceived an important component for women as they planned the rebuilding of their lives following a catastrophic event through activities, such as additional education, which promoted upward mobility (Deterding, 2015).

Whether the community college diverts students from the baccalaureate or enhances democratization of higher education is not entirely evident as literature from researchers has developed contradicting perspectives on the subject. Townsend (2007) concedes that quantitative studies confirm that attendance at the community college does reduce likelihood of baccalaureate degree completion, but points out that the four-year college route is not for everyone. She reiterates that the low cost and regional proximity of the community college are still important factors, but the ultimate decision for many individuals to begin their education at the community college is the unobserved attributes of its culture. The community college provides a unique nurturing environment to students. Townsend attributes the unobserved attributes of the community college make it the rational choice for many citizens pursuing the baccalaureate degree.

Community college penalty.

Monaghan and Attewell (2015) found that the vocational influence of the community college was not a factor in baccalaureate degree completion disparity, contradicting the earlier claims of Brint and Karabel (1989). They found that widespread credit loss experienced by students upon entry to the four-year institution was deemed as the major obstacle in degree completion, and credit loss contributed to extended time-to-degree completion. The term “the community college penalty” was used to describe the consequences transfer students pay for attending the community college (Bahr et al., 2013; Long & Kurlaender, 2009; Mullin, 2012). The penalty results in extended time for baccalaureate degree completion, excessive credit accumulation, and an increased risk of drop-out. Long and Kurlaender (2009) found the community college penalty to be persistent in studies, regardless of methods which attempt to control confounding variables involving demographic status or previous academic achievement.

Mullin (2012) contended that the cause of the community college penalty rests with the four-year institutions. According to Mullin (2012), 82% of students successfully complete the baccalaureate degree when the receiving institution accepted all of a student's academic credits, while receiving institutions that did not accept all credits experienced a 42% graduation rate. Mullin (2012) found credit mobility between institutions to be the major challenge for community college transfer students. Credits are seen as a form of currency (Junor & Usher, 2008) in the academic community and credit loss is a substantial deterrent for transfer students (Mullin, 2012).

Traditional enrollment patterns are changing, which further complicates transfer and the transfer penalty (Wang & Wickersham, 2014). As an example, swirling is a pattern of enrollment where the student "starts in either a four-year college or a community college, and moves back and forth between them for at least one cycle, accumulating more than 10 credits from both sectors in the process" (Adelman, 2006, p. 69). Some of these students start at the community college, while others begin at the four-year college. Although transfer from two- to four-year colleges is most common, lateral transfer between community colleges was the next common form of transfer (Bahr, 2009). New education delivery methods such as online courses, dual-enrollment courses, free courses, massive open online courses, and prior learning assessment activities further complicate recognition of academic attendance patterns. Technology has been the instrument for enabling these new learning experiences, but the detail remains unclear on how these learning experiences will be connected to academic credit and transfer. How receiving institutions will choose to accept this credit for the baccalaureate degree will be a future challenge to transfer students (Mullin, 2012).

Supporting transfer students.

In the theory of student departure, Tinto (2010) describes three categories of reasons for student drop-out: academic difficulties, inability to resolve academic and occupational goals, and the failure to integrate socially and academically with the institution. Institutional social and academic integration has been a subject of considerable interest (Bean & Metzner, 1985; Tinto, 2010) as it has been shown to enhance student retention and thus degree completion. Bean and Metzner (1985) describe social integration as “the extent and quality of a students’ interaction with the social system of the college environment” (p. 507). Transfer students are faced with a unique challenge in overcoming social and academic integration issues for a second time as they matriculate from the community college to the four-year institution.

Although social and academic integration are important to all students, its relevancy to the community college can be considered different as these institutions serve higher percentages of nontraditional students with different needs than traditional students. Without appropriate support interventions, these unique challenges can lead to higher rates of student attrition. Bean & Metzner’s (1985) model of student attrition is specifically aimed at nontraditional students. The model consists of background variables, academic variables, environmental variables and social integration variables. According to these authors the background variables found in nontraditional student attrition included: age, enrollment status, residence, educational goals, high school performance, ethnicity, and gender. Academic variables which led to attrition included: study skills, academic advising, absenteeism, major certainty, and course availability.

In addition to academics, nontraditional students are faced with other responsibilities. Some are parents and have the responsibility of raising a family, while others may be tasked with full-time employment to provide financial support for themselves and dependents. The

nontraditional student may be regionally bound and not able to transfer to a four-year campus outside of commuting proximity. The Bean and Metzner model (1985) described these factors as the environmental variables linked to nontraditional student attrition. This model accounts for challenges associated with finances, hours of employment, outside encouragement, family responsibilities, and regional proximity issues associated with transfer. Outcomes important to this student cohort are both academic and psychological. Although grade point average was the predominant outcome sought by the nontraditional student in the Bean and Metzner (1985) model, the model also found utility, satisfaction, and goal commitment to be important psychological outcomes for the nontraditional student. Although Tinto (2010) stressed the importance of academic and social integration in supporting the traditional student, Bean and Metzner (1985) described a modified integration model for nontraditional students, while Calgano et al. (2007) found that retention of nontraditional students is best achieved by relieving external pressures through flexible scheduling, distance learning, and childcare.

Heating up or cooling off.

Transfer shock is “a decline in the GPA on transferring from a community college to a four-year institution (often experienced in the first semester)” (Glass & Harrington, 2002). The transfer shock phenomenon occurs upon transfer from the two-year campus and is measured by student grade point average during the first semester at the four-year institution (Bahr, 2009). Glass and Harrington (2002) found that the effect of transfer shock was temporary. Transfer students recover from transfer shock in subsequent semesters and perform as well or better than non-transfer students as they matriculate toward degree completion.

Clark (1960) coined the term “cooling out” (p. 569) as a process where the academic advisor worked with the overly ambitious and underprepared student to dissuade them from

pursuing unrealistic goals. In cooling out, the student gradually disengaged from self-described academic goals to refocus on lesser, but more easily attainable achievements. The advisor was the key agent for the cooling out process in interpreting diagnostic test results and making recommendations based upon perceived capabilities of the student. Bahr (2008) noted the cooling out process to raise potential implications involving social stigmas found in academically underprepared students and race. Community college critics suggested that the cooling out process diverted students away from the baccalaureate and into CTE programs of study (Monaghan, 2015). Further studies have shown that Clark's (1960) cooling out effect is seen to have minimum impact on academic aspirations, while the impact of academic advising has been shown in nearly all conditions to actively benefit all students' attainment (Bahr, 2008). The "heating up" process (Alexander, Bozick, & Entwisle, 2008) suggested that as students spend more time in the community college, their educational aspirations increase. The heating up effect has challenged earlier research involving the cooling off effect. Monaghan (2015) stated that the empirical data from more recent studies (Alexander et al., 2008; Leigh & Gill, 2003) have invalidated the theory that the community college's cooling out influences baccalaureate degree completion.

Associate degree completion.

Students completing the associate degree typically enter the four-year college with junior-level status provided all credits are accepted by the receiving institution (Cohen & Brawer, 2003). While the ultimate goal for the transfer student is completion of the baccalaureate degree, completion of the associate degree may not be as important to the student. Ultimately, it is the number of credits accepted by the receiving institution that dictates student progress toward the

baccalaureate. But for the two-year college, the conferring certificates and degrees is an important metric used by leaders to assess institutional productivity.

Several studies have shown that completion of the associate degree increases the likelihood of baccalaureate degree completion. A study in the State of Illinois found that students earning the associate degree were more likely to earn the baccalaureate degree than those students transferring to the four-year college without associate degree completion (Illinois State Board of Higher Education, 1994). In another single state study, earning an associate degree designed for transfer was found to provide a large and positive effect on baccalaureate degree completion, while no impact was found for students completing a workforce-related applied associate degree (Kopko & Crosta, 2016). In another single state study, completion of the associate degree was found to enhance the likelihood of transfer (Roksa & Calcagno, 2008).

Student advising.

Students who are given an academic plan which clearly identifies the courses and are provided with the necessary guidance and support to follow that plan are more likely to persist in completing a degree (Bailey, Jaggars, & Jenkins, 2015). Bailey et al. (2015) argued that the community college system consists of disconnected courses creating a self-service model which enables students to make poor choices, thus hindering degree completion. These authors recommended the guided pathway model for advising students in which a clear path to graduation has been developed. Tinto (2010) stated that “knowing the rules, regulations, and requirements for course, program, and degree completion is part and parcel of student success” (p. 57).

Gard, Paton, and Gosselin (2012) reported that inaccurate advising has resulted in prolonged enrollment and increased time to degree completion, further stating it to be the major

student complaint with transfer processes. Allen, Smith, and Muehleck (2013) described distinct differences in advising pre-transfer students and post-transfer students. The perceptions from both student groups indicated that the most important advising functions involved those in which the advisor provided accurate information on institutional policies, procedures, and degree requirements. Pre-transfer students rated navigating course options in completing general education requirements and choosing a degree to be the most helpful advising functions.

Post-transfer students reported feelings of anonymity following transfer to the four-year college. This student cohort indicated that they missed the personal relationships established with faculty and staff at the community college. Allen et al. (2013) recommended that concerted efforts are needed by four-year campus advisors in which personal relationships are established with the transfer student. Bahr (2013) reported that the post-transfer transition processes associated with academic integration had received less attention in the literature, thus confusion persists on how to measure and assess these post-transfer advising processes.

Time-to-degree.

Although some authors find no difference in likelihood of completing the baccalaureate degree for students beginning at the community college (Rouse, 1995; Melguizo, Kienzl, & Alfonso, 2011), others have found that the community college attendance reduces the probability of attaining the baccalaureate degree (Alfonso, 2006; Long & Kurlaender, 2009). Most authors do agree that time-to-degree will take longer for transfer students (Monaghan & Attewell, 2015). Reasons for longer time-to-degree are numerous including: credit loss incurred at receiving institution (Monaghan & Attewell, 2015), additional credit requirements incurred through remedial coursework for academically underprepared students (Calgagno et al., 2007), and the part-time enrollment patterns of community college students (Glass & Bunn, 1998). Monaghan

and Attewell (2014) found that once transfer does take place, the two-year college student is just as likely to graduate as the non-transfer student. Student characteristics involving self-reported intention to transfer at entry, full-time attendance, and choosing a STEM-related major were identified as positive attributes for transfer probability (LaSota & Zumeta, 2016). Interestingly, LaSota and Zumeta (2016) reported that working 1 to 19 hours, no more or less, was associated as a positive characteristics associated with transfer success.

Bradburn, Hurst, and Peng (2001) described inconsistencies in the various methods used in calculating baccalaureate transfer rates. According to Bradburn et al., great variability exists in how researchers calculate the numerator and the denominator of participants defined in various studies. These authors described eight different definitions for identifying potential transfer student. A less restrictive denominator resulted in poorer transfer rates, while a more restrictive definition resulted in higher transfer rates. Criteria included factors associated with student intentions, continuous and full-time enrollment patterns, course selection, and choice of major. These inconsistencies confound leaders looking to develop policy based upon these studies.

Stuart (2013) described flaws in the Integrated Postsecondary Education Data System (IPEDS) currently in use as a component of the Higher Education Act. IPEDS does not count transfer student graduates in the receiving institution's graduation statistics. According to Stuart (2013), the flaw in IPEDS is that it only counts first-time, full-time students in reporting graduation rates. The resulting impacts to institutions are graduation statistics without recognition of the four-year college transfer student population. Community colleges are not credited for transfer student success despite fulfillment of the student's end goal of baccalaureate completion.

Although many states are improving data collection systems, time-to-degree studies are still sporadic in the literature and likely due to the complexity of compiling comprehensive multi-year student data across multiple state institutions into longitudinal data sets (Wellman, 2002). A weakness found in the literature are the limited transfer studies which utilize longitudinal student data across multiple institutions or statewide systems (Bahr et al., 2013). A lack of comprehensive statewide data tracking systems across multiple institutions limited the usefulness of many studies as the external validity of the results jeopardize generalization to the population, thus leaving educational leaders with incomplete conclusions (Wellman, 2002). Limited studies involving time-to-degree are found in scholarly journals (Glass & Bunn, 1998), while the majority of studies on the subject are limited to dissertations. Findings from dissertation studies are found in the next section of the literature review.

In a single institution study, Brown and Uyar (2012) found that time-to-degree is longer for transfer students in the State of Iowa. These authors concluded that transfer students may not experience the financial savings expected by attending community college. Long and Kurlaender (2009) found that community college transfer students are 14.5% less likely to earn the baccalaureate degree within 9 years and concluded that the educational outcomes for community college students is less than non-transfer students. Although transfer students experience extended baccalaureate time-to-degree, studies needs to be balanced in the context of potential financial rewards associated with lower tuition at the community college. Long and Kurlaender (2009) recommended further study and a focus on policies which support transfer students.

Denning (2015) found that the reductions in tuition were responsible for an overall increase in baccalaureate degree completion. Tuition reductions at the community college were seen to make the difference in the student's ability to attend or not attend college. Denning's

study in the State of Texas, concluded that the lower cost of the community college increased enrollment and baccalaureate degree completion reinforcing the community college's democratization effect in higher education.

Melguizo et al. (2011) found that baccalaureate degree completion for transfer students was 60% as compared to 73% for non-transfer students. In examining the National Education Longitudinal Study (1988) Melguizo et al. reported minimal credit loss for transfer students. After controlling for individual student differences through propensity score matching, these researchers found no difference in completion rates for transfer students. The results of the study reaffirm the community college transfer as a viable avenue for students aspiring to complete the baccalaureate degree.

A comprehensive study of baccalaureate degree completers was conducted by the US Department of Education's National Center for Educational Statistics (Cataldi et al., 2011). The Baccalaureate and Beyond Longitudinal Study of 2008-2009 used a combination of interviews and transcripts in generating a sample of over 14,000 participants across the United States. The study concluded that median time-to-degree at public institutions was 55 months for non-transfer students, while the median time-to-degree for transfer students who started at a two-year public institution was 63 months. After six years, 83% of non-transfer students had completed the baccalaureate degree, in comparison to 62% of transfer students. Furthermore, Cataldi et al. found that ten years was required to see similar rates (81%) of baccalaureate degree completion amongst transfer students in comparison to non-transfer students.

Townsend (2001) describes a multitude of variables influencing transfer student time-to-degree, completion, and credit loss. Plans at time of admission, choice of major, and swirling behaviors categorize the student-based variables, while articulation agreements and academic

quality of courses serve as institutional variables. In determining the total cost of baccalaureate degree completion, lower tuition rates of the community college must be balanced with costs associated with these other variables.

Vertical co-enrollment describes an attendance pattern where a student is simultaneously enrolled in two- and four-year colleges (Wang & Wickersham, 2014). The results of Wang and Wickersham's (2014) study found a positive relationship in baccalaureate degree completion and persistence for both non-transfer students and community college students. Technology-driven education delivery, such as distance learning, is creating new enrollment patterns involving transfer and swirling students.

In a multiple institution study of the North Carolina system, Glass and Bunn (1998) concluded that given sufficient time, transfer students from community colleges completed the baccalaureate degree, including 55% completing within 4 years following transfer and 91% within 7 years following transfer to the senior institution. It took longer to graduate for students employed while attending the senior institution. Advising by faculty and transfer counselors was perceived as a positive contributing factor in timely degree completion. Furthermore, students did not perceive major barriers in transferring to senior institutions, but the major complaint was credit loss. Glass and Bunn (1998) found students experienced greater transfer credit receptivity from private senior institutions than public institutions.

Articulation and policies.

While much of the transfer education literature has focused primarily on activities at the two-year college campuses, the policies, practices, and initiatives found at both the state-level and individual four-year college campuses have a substantial influence on student transfer success and baccalaureate degree completion (Bahr et al., 2013; Glass & Bunn, 1998; Monaghan

& Attewell, 2015; Wellman, 2002). Cohen and Brawer (2003) stated “one of the thorniest problem is that of determining which community college courses are acceptable for graduation credit in which university” (p. 344). Wellman (2002) described the importance of student academic credit transfer between higher education institutions as a critical dimension in the performance of state systems of higher education. Wellman (2002) framed transfer performance as a state policy issue reinforcing the growing importance of transfer from a community college to a four-year institution. Transfer influences socioeconomic issues such as education access, equity, and affordability; and performance issues involving cost effectiveness, degree productivity, and quality. According to Wellman (2002), “the baccalaureate degree is becoming the entry point to the workforce for the majority of students, making it increasingly important that 2/4 transfer works well” (p. 7).

State-level systems of “articulation agreements, common course numbering, and curriculum decisions that the policymakers develop all play a pivotal role in determining how many transfer credits will be accepted and hence the likelihood of students' attaining their educational goal” (Doyle, 2006, p. 58). Despite developing best practices for student transfer, community colleges will see little success in student transfer without the support of four-year institutions (Bahr et al., 2013). “The bottom line is not transfer, support for transfer, institutional partnerships around transfer, etc., but the completion of the degree itself” (Bahr et al., 2013, p. 460)

Kintzer (1976) stated, “the willingness of politicians and educators alike to support policy decisions favoring students is also indispensable in developing curriculum exchange agreements” (p. 148). Education Commission of the States (ECS) conducted a national review of transfer education in which it identified seven policy criteria for transfer and articulation. The criteria

included: legislation, cooperative agreements (unofficial policy), transfer data reporting, incentives to encourage transfer, availability of statewide articulation guides for students, statewide common core courses among institutions, and common course numbering (to reduce non-transferable credits) as the traditional transfer policy tools available to leaders overseeing state systems of higher education (ECS, 2001).

Wellman (2002) compared transfer systems in three high-performing states and three low-performing states in developing a set of state transfer policy recommendations. Wellman (2002) found establishing state-system policies for core curriculum, articulations agreements, and credit transfer, while publishing web-based statewide transfer guides to be the best mechanisms for enhancing student transfer. The use of performance data was seen as most significant, but Wellman (2002) cautioned that accountability structures at four-year campuses may prove counterintuitive, as the time-to-degree completion for community college transfer students will be longer. If policy-makers are truly supportive of the community college transfer function, Wellman (2002) recommended that state systems should consider transfer performance funding as an incentive.

Dougherty, Reed, and Nienhusser (2006) audited transfer policies at 27 colleges in 5 states finding that the main focus was on credit retention. Other recommendations from the transfer policy audit are state policy which provided: specific financial incentives for transfer students, transfer advising funding, articulation agreements which include private institutions, enhanced transferability of occupational credits and dual-enrollment credits, and transfer performance as a performance accountability measure.

LaSota and Zumeta (2016) provided an important contribution to the recent literature by analyzing a student transfer and state policy data set (2003-2009). Their findings reinforce

results from earlier studies in reporting that state articulation policy, articulation agreements, and transfer data reporting provide a statistically significant difference in transfer probability, and concluded the effect is likely greater for certain student sub-groups such as first generation college students or economically disadvantaged students.

Some states have sought to improve transfer performance by conferring baccalaureate degrees at community colleges (Dougherty et al., 2006). As a new mission function, the community college would serve as a hybrid institutions which awarded the baccalaureate in addition to associate degrees and certificates (Floyd, Skolnik, & Walker, 2005). Gerlach (2015) concluded that students attending a hybrid college are less likely to transfer and thus were more likely to complete the baccalaureate degree than students attending other two-year colleges.

Anderson, Sun, and Alfonso (2006) found that students in states with system-wide articulation policies do not experience an increased probability of student transfer when compared to states without system-wide articulations, but these authors caution that such studies should be placed in proper context. These initiatives are significant policy changes, effecting the way business is done. Transforming the culture of an organization shifts how organizations do business and it might not return immediate dividends, while the “re-culturing process” (Fullan, 2001, p. 44) unfolds. In other words, “statewide articulation agreements as policy instruments may actually enhance transfer rates, given sufficient time since their promulgation into law” (Anderson et al., 2006, p. 282). Immediate analyses of data sets might not be helpful in assessing policy.

Montana University System policies.

During the past decade, the State of Montana has attempted to strengthen the two-year college system by adopting policies aimed at enhancing transfer and creating initiatives to

increase enrollment and capacity (Montana Board of Regents, 2005, 2007; MUS, n.d.). The Education Commission of States (ECS, 2001) transfer classifications will serve as the conceptual framework in examining state-level policies and initiatives implemented over the last decade by the Montana University System (MUS). Table 1 provides a mapping of the ECS transfer policy categories and MUS transfer initiatives.

A common course numbering catalog (Montana Board of Regents, 2007) was created for every curriculum subject area and course in the MUS. The CCN catalog was developed by faculty committees representing all institutions. By identifying the common learning outcomes of every course at every institution, faculty developed a statewide catalog. The catalog was made available online for all students to view at the CCN website (<https://ccn.mus.edu/search>).

A statewide general education common curricula was developed with the intention of assisting students by allowing the transfer of an entire block of courses from one institution to another. The block coursework designated by the State general education common curricula, fulfilled the general education requirements for the baccalaureate degree at all receiving public four-year institutions in the MUS. The receiving institutions were required to accept the block transfer of courses in fulfilling all general education requirements and not require any further requirements for general education, thus minimizing student credit loss.

Although sporadic, cooperative two-plus-two agreements have been developed by inter-institutional programs, departments, and colleges typically through informal faculty partnerships. Cooperative agreements can be found in official college catalogs and advising pathway websites.

The Office of the Commissioner of Higher Education (OCHE) developed the position of Deputy Commissioner of Higher Education (MUS, 2008) whose primary responsibility was to lead workforce and transfer education at all two-year colleges in the MUS. College!Now (MUS,

2012) was introduced, aimed at generating significant change to higher education in the MUS by enhancing public awareness and perceptions of two-year colleges through rebranding, marketing, and advertising. College!Now changed many two-year colleges in the State by implementing the comprehensive two-year college mission with a new focus on transfer education. Student capacity has been expanded through several two-year infrastructure expansions and additions. As an example, the University of Montana will be opening a new campus and building for Missoula College (University of Montana, 2013).

Other leadership efforts have sought to improve advising practices on two-year campuses through standardization and centralization. These leadership actions aim to attract new students from two-year colleges and smooth student transfer from two-year to four-year institutions.

Over the course of the past decade, two-year, four-year, and community college campuses worked to implement an integrated student data information system (Banner). The final piece in the system was completed at the culmination of Spring Semester 2016 by connecting the Flathead Valley Community College student record system to the centralized data collection system. Hosted by the Montana Office of the Commissioner of Higher Education (OCHE), an inter-institutional repository (Montana University System, n.d.) of student data records is now available for all MUS institutions.

State of Montana leadership in higher education continues to advocate for greater use of the two-year college system. The reduced rates of tuition provide a distinct incentive for student attendance at two-year colleges and is seen by leadership as one solution in addressing the escalating costs to higher education.

The MUS initiatives follow the ECS policy model in six of the seven areas by: charging all two-year colleges with the comprehensive community college mission, implementing

statewide data systems for tracking students, and developing mechanisms to minimize credit loss. ECS described the importance of providing student incentives as a policy tool for energizing transfer. Missing from the MUS initiatives was the development of any financial rewards to students, other than lower tuition rates, which could be used to encourage student transfer.

Table 1.

ECS transfer policy categories and MUS initiatives

ECS (2001) Transfer Policy Category	MUS Transfer Initiative
Transfer legislation (mission)	College!Now (2012)
Cooperative agreements	Program-Specific 2+2 Articulations (ongoing)
Transfer data reporting	Centralized student data repository (2016)
Student incentives and rewards for transfer	N/A
Statewide articulation guides available to students	CCN Course Guide Website (https://ccn.mus.edu/search , 2007)
Statewide common core curricula	MUS transferable core for general education (2007)
Common course numbering	Common course numbering (2007),

Other important findings in the literature that are missing from current MUS transfer policy is the function of pre- and post-transfer advising (Dougherty et al., 2006; Glass and Bunn, 1998; Wellman, 2012), transfer performance accountability measures for the four-year

institutions (Wellman, 2002), inclusion of articulations with private institutions including tribal colleges (Wellman, 2002), and any sort of investment in core resources for transfer at the institutional level.

Summarizing transfer.

Transfer is the least understood and most controversial function of the comprehensive community college mission (Alfonso, 2006; McPhail & McPhail, 2006). Advocates state that community colleges provide a democratization effect by increasing the educational attainment for all citizens (Leigh & Gill, 2003; Rouse, 1995), while critics describe the diversion effect where community colleges divert students away from four-year colleges, making them less likely to complete the baccalaureate degree (Alfonso, 2006; Brint & Karabel, 2001; Pascarella & Terenzini, 2005). Scholars describe the community college penalty as the consequences of extended time-to-degree, credit loss, and increased risk of dropout incurred by students attending community colleges (Bahr, 2013; Long & Kurlaender, 2009; Mullin, 2012). The theory of student departure (Tinto, 2010) is used to explain the importance of academic and social integration for traditional student retention and completion, while the nontraditional student attrition model (Bean & Metzner, 1985) describes the unique challenges nontraditional students face in degree completion. The temporary phenomenon of transfer shock (Glass & Harrington, 2002) is found in the majority of transfer students, where a decline in academic performance is seen during the initial semester of attendance at the receiving institution. Although the cooling-out effect (Clark, 1960), where the overambitious student is dissuaded from pursuing unachievable goals, was once attributed to diverting students away from pursuing liberal arts education, the heating-up effect (Alexander, Bozick, and Entwisle, 2008) has been credited with increasing student educational aspirations as they spend more time in the community college.

Completion of the two-year transfer associate of arts or associate of science degrees has been shown to have a positive effect on the likelihood of student transfer and completion. Time-to-degree has been shown to take longer for transfer students for a number of reasons. Credit loss (Monaghan & Attewell, 2015), part-time and non-continuous enrollment patterns (Glass & Bunn, 1998), and additional remedial course requirements (Calgagno et al., 2007) are contributing factors. Credits are seen as a form of currency in higher education (Junor & Usher, 2008) and credit loss is perceived as the major deterrent to student retention and time-to-degree (Mullin, 2012). Policy was found to improve transfer processes in statewide systems of higher education by avoiding credit loss (Wellman, 2002). Statewide policies recommended to improve state systems of transfer include: transfer legislation, cooperative articulation agreements (unofficial policy), transfer data reporting, financial incentives to encourage transfer, readily available statewide articulation guides for students, statewide common core courses among institutions, and common course numbering (to reduce non-transferable credits) have been recommended as policy tools for improving transfer within state systems of higher education (ECS, 2001). Over the last ten years, the Montana University System has implemented, in some form, all but one of the ECS recommended transfer policy tools.

Findings from Other Dissertation Studies

A review of studies obtained from the *Proquest Dissertations and Thesis* electronic database abstracts using the keywords: “baccalaureate degree” AND “transfer” AND (“graduate” OR “completion”) yielded a total of 84 manuscripts. This literature search was further refined to only include doctoral dissertation studies conducted within the last twenty-five years (1992-2016). Results and conclusions from 58 purposefully selected dissertation studies were synthesized and revealed common themes involving: the phenomenon of student transfer;

characteristics of the transfer student; the influence of state policies and institutional practices; and student persistence and time-to-degree.

Transfer phenomenon.

The phenomenon of student transfer is prevalent at institutions of higher education throughout the United States. The most common phenomenon involving two- and four-year colleges is vertical transfer in which a student begins studies at a two-year college prior to transferring to a four-year institution with the aim of completing the baccalaureate degree (Cohen & Brawer, 2003). Transfer students graduate with the baccalaureate in significant numbers throughout all regions in the Nation at both private and public institutions of higher education as demonstrated by studies in Oregon (Leavitt, 1995), Delaware (Smith-Moore, 2013), and New Mexico (Clingman, 2006).

Transfer, in route to the baccalaureate, may or may not involve completion of the two-year associate degree (Smith-Moore, 2013). Completion of the associate degree was not found to have any effect on completion of the baccalaureate (Johnson, 2014). While the associate of science (AS) and the associate of arts (AA) degrees awarded by two-year colleges are typically designed for transfer, the curriculum of associate of applied science (AAS) degree has been described as terminal, in the sense that there is no direct transfer pathway evident for individuals seeking to pursue the baccalaureate degree (Cohen & Brawer, 2003). The curricula of AAS degree programs are characterized as workforce-related training with limited general education content and transferability, yet AAS graduates were successful in leveraging credits from to complete the baccalaureate (Brown, 1994; Childers, 2004; Ewers, 2014; Moumouris, 1997; Truesdell, 1997). In Illinois, baccalaureate time-to-degree for students with the AA and AS transfer degrees was one semester shorter in duration with an average credit accumulation nine

credits less than students with AAS degrees (Childers, 2004). Most students completing the AAS did not identify transfer as their initial goal for attending the community college (Truesdell, 1997). Faculty, from both the two-year and four-year campuses, play a critical role in the success of AAS graduates completing the baccalaureate (Brown, 1994). Students with the AAS degree demonstrated better academic performance at the four-year college than other baccalaureate graduates (Smith, 1995).

Several studies have examined the transfer phenomenon in professional nursing programs (Bradley, 1998; Kilcullen, 2004; Roat, 2008; Smith-Stillson, 2009). These students begin professional careers following completion of certificates and associate degrees returning at a later date to begin the baccalaureate degree. These programs of study are unique in that their student population is typically older in age and assumes additional responsibilities as working professionals, parents, and spouses. The Associate of Arts in Teaching (AAT) degree is a new baccalaureate initiative in Missouri and other states (Stuart, 2012) to prepare aspiring teachers for transfer through comprehensive articulation agreements with two-year colleges.

Reverse transfer (Cohen & Brawer, 2003) occurs when students enroll in two-year colleges after enrollment in a four-year college. Understanding the advanced technologies of the information age was one motivation for reverse transfer to technical colleges following baccalaureate degree completion, but employment status and career intent was the primary factor which influenced reverse transfer (Birkholz, 2002). Reverse transfer occurred more commonly among female students rather than male and minority students rather than Caucasian (Alston, 2000). The reverse transfer student had a GPA of 3.0 or higher and completed the baccalaureate degree in six or more years.

Transfer shock (Glass & Harrington, 2002) was found to be temporary and students finished with a similar GPA as was earned at the two-year college (Boyd, 1998; Ewers, 2014). Adjusting to living situations and housing was identified as the primary factor contributing to transfer shock (Ewers, 2014). Graduates earning AAS degree at two-year technical college displayed higher levels of transfer shock, but these students also finished the baccalaureate with a similar GPA (Smith, 1995).

Characteristics of the transfer student.

The two-year college culture was preferred by transfer students over the environment found at the four-year receiving institution (Karmara, 2012; Price, 1993). Transfer students were more likely to be female (Smith-Moore, 2013), employed (Price, 1993; Smith-Moore, 2013), non-traditional age (Gebel, 1993; Price, 1993; Truesdell, 1997), living with a spouse (Price, 1993), supporting dependent children (Price, 1993), and a first generation college student (Price, 1993).

In Florida, most minority students used the two-year college system as the pathway in obtaining baccalaureate (Ross, 1993). Minority students were found to be overrepresented in the community college system and underrepresented at flagship institutions (Libarios, 2013) with less academic success seen among minority students than their Caucasian student counterparts (Jenkins, 2016). Proportionally fewer minority students than Caucasian students persist to the baccalaureate on two-year or four-year campuses (Egamba, 1997; Spote, 2002). Student involvement and engagement; connections with faculty, staff and other students; financial issues; and support of family were identified as influential factors in the success of minority students (Dorame, 2012). The experiences of African American transfer students in Texas, were found to be similar to the experiences of other transfer students, despite the perception that it was much

different due to negative stereotypes, lack of role models, and racial bias (Wilson, 2013). Race and sex were not found to be a factor in baccalaureate completion for transfer or non-transfer students in the State of the Mississippi (Johnson, 2014). In Texas, no linear relationships in persistence were found between graduation rates and gender, age, ethnicity, or level of parental education (Miller, 2013), but in the California community college system, lower persistence and degree completion among minority students were observed (Dorame, 2012),

Greater success in completing the baccalaureate was observed among nontraditional students who were married and female at Indiana State University (Dillon, 1994). Acceptance of transfer credits at receiving institutions was identified as a contributing factor in baccalaureate completion (Ewers, 2014; Gebel, 1993). The relationships developed between students and their assigned advisor was perceived as the most important asset in the transfer process (Karmara, 2012). Students demonstrating patterns of full-time enrollment intensity and enrollment continuity were found to have greater persistence and completion (Gebel, 1993, Perino, 1999). Student age (Moumouris, 1997; Perino, 1990), declaration of a major (Perino, 1999; Turk, 2012), and transfer GPA (Moumouris, 1997) were found to be the most significant factors influencing completion of the baccalaureate for transfer students

The two-year college serves as a particularly important baccalaureate access point for students from lower socioeconomic backgrounds due to the reduced tuition costs and the convenience of regional campuses (Miller, 2015; Perino, 1999; Taylor, 2015). Families of non-transfer students had higher income levels than two-year college transfer students (Price, 1993). The expectation of vertical transfer among two-year college students was linked to parental income level (Miller, 2015). Higher percentages of non-transfer students had parents who contributed more of the educational costs for the baccalaureate than parents of non-transfer

students (Perino, 1999). Financial assistance policies, such as grants and loans, had a significant effect on persistence and reduced time to completion (Dunlop, 2012; Frank, 2012). Grant-based programs based on financial need were shown to be effective in encouraging persistence among minority transfer students, while scholarships and work study were shown not to be effective (Frank, 2012; Tuttle, 2007). Kamara (2012) identified financial responsibilities as one of the perceived barriers to transfer among first-generation college students.

State policy and institutional practices.

Education and political leaders have implemented state-level policy with the goal of easing student transfer for two- and four-year public institutions in a number of states. In a comprehensive study of literature on state transfer policies, Woodfield (2013) summarized the following list of practices for improving the student transfer experience: faculty engagement in transfer practices, systematic statewide assessment of practices, common course numbering, inclusion of private institutions, a general education common core, equivalency models for a block transfer of courses, and attention to other conditions that reduce transfer rates. Engaging faculty in the form of faculty equivalency committees enhances the legitimacy of the process by bringing forth professional expertise. Collection of statewide student data can be used for assessing statewide performance and implementing change where needed. A system of common course numbering alleviates confusion for students and state higher education institutions. Inclusion of private institutions improves transfer rates and increases the potential number of students that can benefit from transfer practices. A block of common courses guaranteeing general education completion has been shown to improve successful transition for transfer students. In certain cases, equivalency models which assess a block of coursework rather than individual courses has been shown to improve transfer by reducing repetition of outcomes and

repeat experiences. Lastly, Woodfield stated the need to address the other variables which impede student success. These include access for underserved populations, addressing socioeconomic conditions, and support for first generation college students.

Transfer and articulation processes between two- and four-year institutions were found to be working, based upon the finding that transfer students were graduating at a higher rate in Mississippi (Johnson, 2014). Implementation of articulation agreements and a statewide general education core was shown to have a positive impact on reducing the total credit accumulation of students, but it did not change student degree completion or persistence (Turk, 2012). Other studies indicated that transfer students completing a statewide general education were more likely to persist in completing the baccalaureate degree, earned higher GPAs, and had shorter time-to-degree (Dosumu, 1998). Articulation processes have been found to be more effective in promoting baccalaureate completion for transfer study than course equivalencies (Jones, 2007; Munkittrick, 2009). In one specialized degree program, articulation agreements were responsible for have higher rates of persistence and completion among transfer students than non-transfer students (Deitrick, 2008). Tracking systems were identified as crucial tools for analyzing transfer and articulation data, but absent from institutions in a number of states (Deitrick, 2008; Smith 1995).

In addition to state policy, institutional practices have been shown to impact student transfer success. Institutional practices focused on social integration experiences of the student, the student's connection with faculty members, and the student's advising experiences have, at both two- and four-year campuses, been shown to improve student transfer (Bandyopadhyay, 2008; Duffy, 2005; Franke, 2012; Galloway, 2000; Gonzalez 2013; Tengove 2014). Social integration, student engagement and academic achievement were integral components for these

students in achieving their academic, personal, and professional goals (Tengrove, 2014).

Although the academic needs of transfer students were met, students found it most difficult to engage in meaningful social structures when transitioning to the receiving four-year college campus, in part because transfer students experience different social and academic integration than non-transfer students (Galloway, 2000). Social cognitive career theory attempts to explain how academic and career interest develop, choices are made, and success is obtained. Social cognitive career theory was shown to be effective in enhancing baccalaureate persistence among nontraditional transfer students in engineering (Sielaff, 2010).

Transfer advising centers, mentoring in sharing examples of successful student transfer experiences, and the development of transfer training in college courses were recommended as interventions in assisting integration of transfer students (Bandyopadhyay, 2008). Higher Education Centers (HEC) created collaborations where transfer services between two- and four-year institutions were centralized. HECs were credited with increasing baccalaureate completion at a higher than national average level (Gonzalez, 2013). Accurate and consistent information from peers, family, and faculty for information involving academic success, transfer requirements, and degree completion were seen as critical pieces for student success (Duffy, 2005; Truesdell, 1997). Institutional policies have been shown to be effective in reducing transfer shock (Romano, 2013).

In a collaborative study of four community colleges, a team of researchers concluded that state policy and mandates do not benefit institutions without addressing the unique dynamics of each institution, responding to local needs, and observing trends (Decker, 2011; Dykes, 2011; Preston, 2011; Phillips, 2011). The “Double the Numbers” initiative sought to increase the overall number of college graduates in the State of Kentucky. One strategy was to enroll more

first-time students in the two-year college systems with the goal of transferring these individuals into baccalaureate degree programs. These results from these collaborative study cited specific institutional obstacles stymied transfer, such as two-year colleges conferring more technical than transfer degrees likely due to local labor market demand. Additionally, the location-bound characteristic of many two-year college students made transfer difficult. Lastly, these researchers concluded the importance of understanding that student transfer is a shared duty among all faculty members, staff members, and administrators is crucial to successful transfer. The culture of the institution must embrace transfer as an option for every student by having access and familiarity with current transfer opportunities and articulations.

Persistence and time-to-degree.

Once a transfer student enters a receiving institution, transfer students experience higher rates of persistence (Deitrick, 2008; Tharp, 1993). Time-to-degree for transfer students was found to be longer than non-transfer students (Brown, 1994; Galloway, 2000; Gebel, 1993; Leavitt, 1995; Spote, 2002; Truett, 1993). Completion of high school dual-enrollment was found to reduce time-to-degree and enrollment persistence for all student groups (Menzel, 2006).

Number of credits completed during the student's first semester of attendance was the most likely indicator for persistence to degree (Tharp, 1993). Enrollment continuity was found to increase the likelihood of completing a two-year college credential, while enrollment intensity increased the likelihood of transfer among two-year college students (Crosta, 2013). Increased time-spans between orientation and enrollment improved persistence among transfer students (Bombaugh, 2015).

Models for predicting baccalaureate persistence and completion have developed with some success. Minear (1998) demonstrated some success in accurately predicting persistence and

completion using a modelling containing more than 12 variables of enrollment patterns, sex, age, and academic abilities.

Summarizing Finding from Other Dissertation Studies.

Based upon a comprehensive review of doctoral dissertations, the transfer phenomenon continues in higher education throughout the United States. Conclusions were: significant numbers of transfer students enrolled at four-year colleges (Leavitt, 1995; Smith-Moore, 2013), not all transfer students completed the associate degree yet still persisted to complete the baccalaureate degree (Johnson, 2014; Smith-Moore, 2013), and students transferring with the terminal AAS degree were successful in completing the baccalaureate degree (Brown, 1994; Childers, 2004; Moumouris, 1997; Truesdell, 1997). The reverse transfer phenomenon from the four- to the two-year campus occurs and will likely continue due to workforce demands (Alston, 2000; Birkholz, 2002). Upon entry to the four-year college, students experienced a temporary lag in academic performance due to transfer shock (Boyd, 1998).

Studies have examined the demographic characteristics, socio-economic attributes, and special circumstances which differentiate transfer students from non-transfer studies. These studies have shown non-Caucasian students to be overrepresented in some two-year colleges (Libarios, 2013), while proportionately fewer non-Caucasian transfer students persist to graduation (Sporte, 2002). Transfer students completing the baccalaureate degree were more likely to be female (Smith-Moore, 2013), were first-generation college students (Price, 1993), tend to come from lower income families (Price, 1993), had less financial assistance from parents (Perino, 1999), worked full-time (Price, 1993), and chose the two-year college due to its lower costs (Miller, 2013). Some two-year college transfer students were nontraditional in age

(Price, 1993; Truesdell, 1997) and serve in nontraditional roles as parents and spouses (Price, 1993).

State-level policy and institutional practices were shown to improve student transfer success (Woodfield, 2013). A statewide general education core (Dosumu, 1998; Turk, 2012), articulation agreements (Deitrick, 2008; Johnson, 2014; Jones, 2007), common course numbering (Woodfield, 2013), and a statewide system for the collection of student data (Deitrick, 2008; Woodfield, 2013) were examples of state-level policies shown to improve student success. Institutional policies promoting social integration (Galloway, 2000; Trengove, 2014), implementing student advising programs (Bandyopadhyay, 2008; Gonzalez, 2013) and engaging faculty members in transfer policies and practices (Truesdell, 1997; Woodfield, 2013) were shown to be effective practices for supporting transfer students.

Once arriving at the four-year institution, two-year college transfer student completion and persistence rates were higher than non-transfer students (Deitrick, 2008; Galloway, 2000; Tharp, 1993), but these students experienced longer baccalaureate time-to-degree and baccalaureate credit accumulation (Leavitt, 1995; Spote, 2002). Enrollment intensity (Crosta, 2013) was shown to increase student persistence (Crosta, 2013; Tharp, 1993).

Summary

In framing the time-to-degree study of baccalaureate degree students, literature on the community college was presented in examining its history, comprehensive mission, institutional culture, and the widely debated transfer function. Community college mission is determined by public statements, curricular functions, and effects (Dougherty & Townsend, 2006). While public statements and curricular functions of mission are more easily identified, effects are covert and more difficult to explain. Statewide systems of transfer processes require examination

of complex relationships between multiple institutions. Systems theory (Getzel & Guba, 1957) provides a conceptual model placing the complexity of statewide systems of transfer in the context of purpose, structures, and sanctions, but also in a greater sense of people and the norms for behavior found in every culture. The review has examined the scholarship of other researchers in framing the study of baccalaureate time-to-degree as one of the effects in determining the community college transfer function operating within a complex statewide system of structures and culture.

Perhaps the conclusions of Sandy, Gonzalez, and Hilmer (2006) best describe the transfer function of the comprehensive community college. The results of their study provide further evidence that attending a two-year college can alter the probability of college completion, but the two-year college has increased overall access to higher education and democratization through greater individual educational attainment. As leaders and faculty members work to implement positive systemic change in improving the transfer system, at some point the burden of completion becomes the responsibility of the individual student. As to Sandy et al. (2006) state “students who enroll in 2-year colleges who fail to complete a 4-year degree do so because their skills and ability may not be up to the standards needed to successfully complete a bachelor’s degree, or are not interested in continuing their education beyond a terminal degree or certificate” (p. 470).

Chapter Three: Methodology

The transfer function of the comprehensive community college mission remains a topic of debate amongst academic scholars. Transfer consists of a series of complex processes with a definitive *purpose* built upon the cooperation of *people* and *norms*, but also independent *structures* found at multiple institutions. Two year colleges advertise the transfer function through public statements of mission and curricular function, but the controversy surrounding determination of transfer in the mission of two-year colleges is based upon its *effects* on constituents. This study examined the transfer function across the entire Montana University System (MUS) from the theoretical perspectives of the social systems model (Getzel & Guba, 1957) and the concept of effects in mission determination (Dougherty & Townsend, 2006).

This study observed differences between those students choosing to begin their education at a MUS two-year college prior to matriculating to a four-year college (transfer students) with those students that choose to begin and finish their education at the same four-year college (non-transfer students) in baccalaureate time-to-degree. The study analyzed the vertical transfer function throughout the MUS using longitudinal student data across multiple institutions.

The literature review provided “the results of other studies closely related to the one being undertaken” (Creswell, 2009, p. 25). The literature review for the baccalaureate degree time-to-completion revealed a number of complex elements facing transfer students. The variables and hypotheses developed in the methodology were based upon the research questions and the characteristics revealed in the review of relevant literature.

The methodology for the study is presented as follows: The research questions guiding the study is restated. The research design is described including a presentation of the study’s independent variable, dependent variables, operational definitions, participants, and hypotheses.

Techniques for data collection, data processing, data measurement, data analyses, and statistical techniques are presented followed by a brief summary of the entire methodology.

Research Questions

This study posed one primary research question and 10 sub-questions related to the primary question. This study seeks to answer the primary research question listed below.

Primary research question. Is there a difference in baccalaureate time-to-degree between transfer students and non-transfer students in the MUS?

This study proposes the research sub-questions listed below:

Research sub-question 1. Is there a difference in credit accumulation between transfer students and non-transfer students completing the baccalaureate degree in the MUS?

Research sub-question 2. Is there a difference in GPA between transfer students and non-transfer students completing the baccalaureate degree in the MUS?

Research sub-question 3. Is there a difference in baccalaureate time-to-degree among transfer students that have completed the transfer associate degree (AA or AS) in the MUS?

Research sub-question 4. Is there a difference in credit accumulation among baccalaureate degree transfer students that have completed the transfer associate degree (AA or AS) in the MUS?

Research sub-question 5. Is there a difference in baccalaureate time-to-degree among transfer students that have completed the associate of applied science degree (AAS) in the MUS?

Research sub-question 6. Is there a difference in credit accumulation among baccalaureate degree transfer students that have completed the AAS degree in the MUS?

Research sub-question 7. Is there a difference in baccalaureate time-to-degree between transfer students from embedded two-year colleges and transfer students from independent two-year colleges in the MUS?

Research sub-question 8. Is there a difference in credit accumulation between transfer students from embedded two-year colleges and transfer students from independent two-year colleges completing the baccalaureate degree in the MUS?

Research sub-question 9. Is there a difference in baccalaureate degree time-to-completion for nontraditional transfer students and nontraditional non-transfer students in the MUS?

Research sub-question 10. Is there a difference in credit accumulation between nontraditional transfer students and nontraditional non-transfer students completing the baccalaureate degree in the MUS?

Research Design

A non-experimental, quantitative research design (Salkind, 2009) with descriptive and inferential statistical analysis was employed for this study. The study was designed to examine students conferred with the baccalaureate degree during the three-year period beginning July, 2013 and ending May, 2016. It compared time-to-degree, credit accumulation, and grade point average for two-year transfer students and non-transfer students within the MUS.

Variables “refer to a characteristic or attribute of an individual or an organization that can be measured or observed and that varies among the people or organization being studied” (Creswell, 2009, p. 50). The “independent variable represents the measure that reflects the outcomes of a research study” (Salkind, 2009, p. 22). The independent variable is also known as the treatment variable. The “dependent variable represents the outcomes of a research study” (Salkind, 2009, p. 22). The dependent variable is the resulting change from manipulation of the

independent variable. The independent variable represents the manipulation or change in the study which impacts the dependent variable. The construct validity is threatened when investigators fail to provide adequate definitions and measures of variables (Creswell, 2009). Table 2 describes all dependent variables, levels of measurement and possible values. Operational definitions were developed for all critical terms to clarify the construct validity of the study.

Independent Variable.

The independent variable for this study was the community college experience. It can be thought of as the result of attending a community college. In this study, the independent variable was attendance at a MUS two-year college in completing the baccalaureate degree. There were five independent variables identified for the study. A listing of the independent variables are found in Table 2. The independent variables were defined as follow:

Independent Variable (IV₁). The independent variable (*IV₁*) is the community college experience as defined by attempting 12 or more credits at a single MUS two-year college prior to transferring to a single MUS four-year college.

Independent Variable (IV₂). The independent variable (*IV₂*) is completion of the associate of arts (AA) or associate of science (AS) transfer degree.

Independent Variable (IV₃). The independent variable (*IV₃*) is completion of the associate of applied science (AAS) degree.

Independent Variable (IV₄). The independent variable (*IV₄*) is the campus location.

Independent Variable (IV₅). The independent variable (*IV₅*) is age of the student.

Table 2

Independent Variables

Variable	Description	Possible Values
IV ₁	Two-year college transfer (community college experience)	Transfer student Non-transfer student
IV ₂	AA (transfer) degree completion	Transfer student, AA or AS degree Transfer student, no AA degree
IV ₃	AAS (non-transfer) degree completion	Transfer student, AAS degree Transfer student, no AAS degree
IV ₄	Campus organization.	Embedded Independent
IV ₅	Age	Transfer student, traditional age Non-transfer student, nontraditional age

Dependent Variables.

The study attempted to identify differences attending a MUS two-year college might have on a student completing the baccalaureate degree. There were three dependent variables identified in the study. A listing of the dependent variables are found in Table 3. The dependent variables were defined as follow:

Dependent Variable (DV₁). The dependent variable (DV₁) is the total time for the student to complete the baccalaureate degree (time-to-degree).

Dependent Variable (DV₂). The dependent variable (DV₂) is the total number of credits completed by the student (credit accumulation) in achieving the baccalaureate degree.

Dependent Variable (DV₃). The dependent variable (DV₃) is the cumulative grade point average (GPA) earned in achieving the baccalaureate degree completion.

Table 3.

Dependent Variables

Variable	Description	Level of Measurement	Possible Values
DV ₁	Completion Time	Ordinal	4 years or less 4 year and 1 semester 5 years 5 and 1 semester 6 years 6 and 1 semester 7 years 7 years and 1 semester 8 years More than 8 years
DV ₂	Credit Accumulation	Ordinal	120-129 credits 130-139 credits 140-149 credits 150-159 credits 160 credits or more
DV ₃	Cumulative GPA	Ordinal	Less than 2.0 2.0-2.5 2.5-2.9 3.0-3.4 3.5-4.0

Operational Definitions.

Associate of applied science (AAS) degree. The AAS degree is a MUS two-year degree not intended for transfer into a baccalaureate program.

Associate of arts (AA) or associate of science (AS) degree. The AA and AS degree is a MUS two-year degree intended for baccalaureate transfer.

College organization. The affiliation and governance of MUS two-year colleges. These colleges are organized as either embedded or independent colleges.

Credit accumulation. The total number of credits accumulated to complete the baccalaureate degree.

MUS four-year college. One of the following institutions: Montana State University (MSU-Bozeman), Montana State University-Billings (MSU-Billings), Montana State University-Northern (MSU-Northern), University of Montana (UM-Missoula), University of Montana-Montana Tech (MT Tech), or University of Montana-Western (UM-Western).

MUS two-year colleges. One of the following institutions: City College, Great Falls College, Helena College, Highlands College, or Missoula College.

MUS embedded two-year college. One of the following institutions: City College, Highlands College, Missoula College.

MUS independent two-year college. One of the following institutions: Great Falls College or Helena College.

Non-transfer student. Student enrolling, attending, and graduating from one and only one MUS four-year college.

Nontraditional Student. Student over 24 years of age at the time of graduation.

Time-to-degree. Difference between graduation term and initial term of enrollment in the MUS. Ordinal data measuring rank as total number of years or total number of years plus additional semester as listed in Table 3. Summer term and autumn term enrollment are calculated as a single semester. Time-to-degree does not recognize varied enrollment patterns or stop-outs.

Transfer Student. Prior to enrolling in a MUS four-year college, a student attempting 12 or more credits at one and only one of the MUS two-year colleges.

Participants.

Population census. The study examined a census of baccalaureate degree graduates at all four-year colleges in the Montana University System including: UM-Missoula, UM-Montana Tech, UM-Western, MSU-Bozeman, MSU-Billings, and MSU-Northern. These individuals had completed their first baccalaureate degree. The study examined baccalaureate degree completers conferred during the consecutive academic years: 2014, 2015, and 2016. The associated time period for the study will be inclusive of participants graduating July 1, 2013 through May 31, 2016.

The delimitations eliminated several groups of participants from the study. Transfer students from non-MUS institutions including Montana community colleges, Montana tribal colleges, private colleges, and out of state institutions were eliminated. Enrollment data collected for several of these institutions were either incomplete or nonexistent. Although these participants qualify as transfer students, the study intentionally selected only transfer students from MUS two-year colleges, as these participants were the group expected to obtain the greatest benefit from these State-level leadership initiatives.

The intentions of lateral transfer students, second baccalaureate degree recipients, and swirling students are unpredictable and serve as another confounding influence to the study. These individuals were eliminated from the population census as described in the study's delimitations.

Transfer students attempted 12 or more credits at one and only one of the following institutions: Helena College, Great Falls College, Highlands College, City College, and Missoula College. Non-transfer students enrolled, attended, and graduated from one and only one four-

year institution. Transfer students were compared to non-transfer students in answering the study's primary question.

Generalizability. The study consisted of a census of all MUS students. Although the findings of this study might not directly apply to populations outside the State of Montana, they will be useful for future students and parents of students considering where to begin their higher education experience. It can be useful to faculty members, university administrators, student advisors, and college administrators in making decisions at local institutions. It can be used to assist MUS leadership, the Office of the Governor, and state legislators examining systemic issues associated with student transfer between higher education institutions throughout the State of Montana. It provides a window for observing student migration patterns and policies promoting transfer and greater utilization of two-year colleges in the MUS. Its findings add to the collection of research literature examining the transfer phenomenon, transfer processes between institutions, efficiency of public higher education as a state system, and student choice in selecting to attend a community college.

Hypotheses and Null.

A hypothesis is stated in a declarative form, describes a relationship between variables, is brief, is testable, and reflects a theory based upon a review of literature (Salkind, 2009). The null hypothesis is used to make a prediction that no significant difference exists between groups on a particular variable (Creswell, 2009). Table 5 provides a listing of hypotheses, dependent variables (Y), and independent variables identified in the study. The hypotheses and null for the study's eleven research questions were defined below.

H₁. The hypothesis stated that a statistically significant difference in baccalaureate time-to-degree exists between transfer students and non-transfer students in the MUS. The null

hypothesis stated that no difference in baccalaureate time-to-degree exists between transfer students and non-transfer students. $H_0 : \mu_{1 \text{ (TRANSFER)}} = \mu_{2 \text{ (NON-TRANSFER)}}$

The hypotheses and null for the study's sub-questions are listed below.

H_2 . The hypothesis stated that a statistically significant difference in credit accumulation exists between transfer students and non-transfer students completing the baccalaureate degree in the MUS. The null hypothesis stated that no difference in credit accumulation exists between transfer students and non-transfer students completing the baccalaureate degree in the MUS. $H_0 : \mu_{1 \text{ (TRANSFER)}} = \mu_{2 \text{ (NON-TRANSFER)}}$

H_3 . The hypothesis stated that a statistically significant difference in GPA exists between transfer students and non-transfer students completing the baccalaureate degree in the MUS. The null hypothesis stated that no difference in GPA exists between transfer students and non-transfer students completing the baccalaureate degree in the MUS. $H_0 : \mu_{1 \text{ (TRANSFER)}} = \mu_{2 \text{ (NON-TRANSFER)}}$

H_4 . The hypothesis stated that a statistically significant difference exists in baccalaureate time-to-degree among transfer students that have completed the associate degree (AA or AS) in the MUS. The null hypothesis stated that no difference exists in baccalaureate time-to-degree among transfer students that have completed the AA or AS degree in the MUS.

$H_0 : \mu_{3 \text{ (AA)}} = \mu_{4 \text{ (NON_AA)}}$

H_5 . The hypothesis stated that a statistically significant difference exists in credit accumulation among baccalaureate degree transfer students that have completed the AA or AS degree in the MUS. The null hypothesis stated that no difference exists in credit accumulation among baccalaureate degree transfer students that have completed the AA or AS degree in the MUS. $H_0 : \mu_{3 \text{ (AA)}} = \mu_{4 \text{ (NON_AA)}}$

H_6 . The hypothesis stated that a statistically significant difference exists in baccalaureate time-to-degree among transfer students that have completed the associate of AAS degree in the MUS. The null hypothesis stated that no difference exists in baccalaureate time-to-degree among transfer students that have completed the AAS degree in the MUS. $H_0 : \mu_{5 (AAS)} = \mu_{6 (NON_AAS)}$

H_7 . The hypothesis stated that a statistically significant difference exists in credit accumulation among baccalaureate degree transfer students that have completed the AAS degree in the MUS. The null hypothesis stated that no difference exists in credit accumulation among baccalaureate degree transfer students that have completed the AAS in the MUS. $H_0 : \mu_{5 (AAS)} = \mu_{6 (NON_AAS)}$

H_8 . The hypothesis stated that a statistically significant difference exists in baccalaureate time-to-degree between transfer students from embedded two-year colleges and transfer students from independent two-year colleges in the MUS. The null hypothesis stated that no difference exists in baccalaureate time-to-degree between transfer students from embedded two-year colleges and transfer students from independent two-year colleges in the MUS. $H_0 : \mu_{7 (EMBEDDED)} = \mu_{8 (INDEPENDENT)}$

H_9 . The hypothesis stated that a statistically significant difference exists in credit accumulation between transfer students from embedded two-year colleges and transfer students from independent two-year completing the baccalaureate degree in the MUS. The null hypothesis stated that no difference exists in credit accumulation between transfer students from embedded two-year colleges and transfer students from independent two-year completing the baccalaureate degree in the MUS. $H_0 : \mu_{7 (EMBEDDED)} = \mu_{8 (INDEPENDENT)}$

H_{10} . The hypothesis stated that a statistically significant difference exists in baccalaureate time-to-degree for nontraditional transfer students and nontraditional non-transfer students in the MUS. The null hypothesis stated no difference exists in baccalaureate time-to-degree for nontraditional transfer students and nontraditional non-transfer students in the MUS.

$$H_0 : \mu_9 (T_NONTRAD) = \mu_{10} (N_NONTRAD)$$

Table 4.

Hypotheses and Variables

Hypothesis	Dependent Variable (Y)	Independent Variable (X)
$H_1 : \mu_1 (TR) \neq \mu_2 (NU)$	DV ₁ : Completion time.	IV ₁ : Two-year college transfer.
$H_2 : \mu_3 (TR) \neq \mu_4 (NU)$	DV ₂ : Credit accumulation.	IV ₁ : Two-year college transfer.
$H_3 : \mu_5 (TR) \neq \mu_6 (NU)$	DV ₃ : Cumulative GPA.	IV ₁ : Two-year college transfer.
$H_4 : \mu_1 (TR_AA) \neq \mu_2 (TR_NON_AA)$	DV ₁ : Completion time.	IV ₂ : AA degree completion.
$H_5 : \mu_3 (TR_AA) \neq \mu_4 (TR_NON_AA)$	DV ₂ : Credit accumulation.	IV ₂ : AA degree completion.
$H_6 : \mu_1 (TR_AAS) \neq \mu_2 (TR_NON_AAS)$	DV ₁ : Completion time.	IV ₃ : AAS degree completion.
$H_7 : \mu_3 (TR_AAS) \neq \mu_4 (TR_NON_AAS)$	DV ₂ : Credit accumulation.	IV ₃ : AAS degree completion.
$H_8 : \mu_1 (TR_EMBED) \neq \mu_2 (TR_IND)$	DV ₁ : Completion time.	IV ₄ : Campus Location.
$H_9 : \mu_2 (TR_EMBED) \neq \mu_4 (TR_IND)$	DV ₂ : Credit accumulation.	IV ₄ : Campus Location.
$H_{10} : \mu_1 (TR_NTRD) \neq \mu_2 (NU_NTRD)$	DV ₁ : Completion time.	IV ₅ : Student age.
$H_{11} : \mu_3 (TR_NTRD) \neq \mu_4 (NU_NTRD)$	DV ₂ : Credit accumulation.	IV ₅ : Student age.

H_{11} . The hypothesis stated that a statistically significant difference exists in credit accumulation between nontraditional transfer students and nontraditional non-transfer students completing the baccalaureate degree in the MUS. The null hypothesis stated that no difference

exists in credit accumulation between nontraditional transfer students and nontraditional non-transfer students completing the baccalaureate degree in the MUS.

$$H_{11} : \mu_{9(T_NONTRAD)} = \mu_{10(N_NONTRAD)}$$

Data Collection

Process.

Student privacy rights are covered by the Family Educational Rights and Privacy Act (FERPA, 1974). Student educational records are private and protected by FERPA. Although student consent is required for access and release of personally identified information (PII) from education records, de-identified data may be shared with any party (United States Department of Education, 2013). Individual-level data with or without an attached record code can be released to researchers to track performance without revealing student identity provided the record code is not based upon the student's personal information (see Appendix A for complete details). Representatives at the Office of the Commissioner of Higher Education (OCHE) agreed to release de-identified FERPA protected data with anonymized record coding to the researcher for the study (see Appendix B for complete details). The researcher received approval from the Institutional Research Board (see Appendix C for complete details) for the study prior to requesting student data from OCHE.

Instruments.

The researcher requested access for two de-identified query views in the MUS Data Warehouse. The first data view (*Graduates*) contained records of baccalaureate graduates from all MUS four-year colleges to include: UM—Missoula, UM—Tech, UM—Western, MSU—Bozeman, MSU—Northern and MSU-Billings, during the three consecutive academic years 2014-2016 as designated by the participants section of the research design. The second data view

(Enrollments) contained enrollment records of all students in the MUS during the time period Summer Term, 2001 through Spring Term, 2016. An anonymized student identifier was provided to join student records between the two database views. The study used data fields identifying campus, term, age, credits earned, GPA, degree, previous college code from the *Graduates* data view. It accessed data fields for campus, term, age, term credits previous degree earned, campus enrollment, and previous college attended from the *Enrollments* data view. Complete information on the database used in the study and the data reduction process in identifying participants (See Appendix D for complete details).

Reliability and Validity. OCHE collects official enrollment data directly from MUS institutions. This data source was based on the authentic enrollment records at each institution ensuring a high-level reliability for data used for the study. To ensure construct and internal validity, participants identified as transfer students from non-MUS institutions were eliminated from the study to ensure that these participants do not skew the data, since the total time-to-degree for these individuals could not be determined from the OCHE data set. It was one of the delimitations identified for the study. External validity was not applicable for this study.

Measurement. Although measurement of time-to-degree, credit accumulation, and GPA exhibit some of the characteristics of order, equal distance, and zero-basis found in interval- or ratio-level data measurement, categorical analysis techniques were chosen for this study. All data collected for dependent variables used ordinal-level measurement (Stevens, 1951). Measurement in a fractional increment of semesters did not accurately measure the primary research question posed for this study. Time-to-degree was measured in years or years plus an additional semester. Summer term enrollment was joined with autumn term in calculating a single additional semester. The researcher chose categorical compilation of data with order and comparisons of

frequency distributions in measuring all dependent variables as the research design in an effort to answer the study's research questions. Categorical levels have been developed in collecting ordinal level data for each variable and are described in Table 2.

Analysis

Descriptive statistics were reported using frequency distribution tables containing frequency, frequency percentages, cumulative frequency, and cumulative frequency percentages at each measurement level. Time-to-degree was analyzed based upon its ranked value as total years or total years plus an additional semester. Credit accumulation and GPA were analyzed by ranking as described in Table 2. Medians were calculated and reported across MUS campuses in providing a descriptive comparison of all groups examined in the study. Analysis using inferential statistics for the testing of statistical significance were performed using the Mann-Whitney U test (Mann & Whitney, 1947) of nonparametric analysis with the effect size calculated from the z value (Fritz, Morris, & Richler, 2012). The U value, p value, and effect size r were reported for each inferential analysis. All data for hypothesis testing analysis were measured at the ordinal data level (Stevens, 1951).

Assumptions.

a priori. The *a priori* assumption for the study is that the alpha level will be set to the value 0.05 ($\alpha = 0.05$). The researcher was willing to state with 95% confidence that the results are not due to random chance. The confidence (beta) level for the study was 95% ($\beta = 0.95$). Effect size was interpreted using Cohen's recommendation as small ($r = 0.1$), medium ($r = 0.3$), or large ($r = 0.5$) (Cohen, 1992). The level of measurement for all dependent variables in the study was based on the ordinal level data. Selection of participants for the study were from a census of the population minus the groups described in the delimitations of the study. All

observations were independent. A normal distribution and homogeneity of variance was assumed.

Post-hoc. Based upon the *a priori* assumptions of the study, the null hypothesis was either rejected or failed to be rejected. If the null hypothesis was rejected, the research hypothesis was inferred to be statistically significant. In answering the research question, effect size in comparing differences was reported as small, medium, or larger based upon Cohen's guidelines for r (Cohen, 1992).

Summary

The study sought to answer the primary research question: is there a difference in baccalaureate time-to-degree between transfer students and non-transfer students in the MUS? The non-experimental, quantitative research design answered 10 additional research questions with one independent variable: the community college experience. The study was based upon a census of baccalaureate degree participants conferred during the period 2014-2016. Transfer students were compared with non-transfer students in reporting time-to-degree as measured in years plus additional semester, and credit accumulation. All data was collected at the ordinal measurement level. The findings included descriptive and inferential statistics. The *a priori* assumption for the study was that the alpha level will be set to the value 0.05 ($\alpha = 0.05$). Descriptive statistics reported frequency distributions and cumulative frequency distributions. Inferential statistics employed the Mann Whitney U (MWU) test for statistical significance and an effect size calculated based upon Cohen's guidelines for the r value.

Chapter Four: Results

The purpose for this study was to examine the difference in baccalaureate time-to-degree among non-transfer students and transfer students from MUS two-year colleges at Montana University System (MUS) four-year colleges. The primary research question asked, is there a difference in baccalaureate time-to-degree between transfer students and non-transfer students? In addition to the primary question research question, the findings from 10 additional sub-questions were presented.

The data for the study were compiled by the Office of the Commissioner for Higher Education (OCHE) and obtained from the MUS Data Warehouse. It was provided to the researcher in the form of two database structured query language (SQL) query views from the MUS Data Warehouse. The first view contained a census of all MUS baccalaureate degree graduates ($n = 20,825$) during the time period July 2013 through May 2016. The second view consisted of student enrollment records ($n = 191,009$) from all MUS institutions for the time period June 2001 through May 2016. An anonymized identifier was provided to track students between the two database views. The complete schema associated with these views is available (see Appendix D for complete details).

The student's first term of attendance, as recorded in the enrollments data set, was used as the start date for deriving baccalaureate time-to-degree. Students beginning during the summer term were assigned the start date of autumn term. Students graduating during summer term were assigned the finish date of autumn term. The rounding of these values was created to support the ordinal data measurement level chosen in the methodology of the study in calculating baccalaureate time-to-degree. The baccalaureate time-to-degree grouping were ranked in categorical order and measured using an ordinal scale of complete years or complete years plus a

single additional semester. These grouping recognized the traditional student attendance pattern of autumn and spring semesters. The difference between the student's start term and graduation term was used in calculating the ordinal value of time-to-completion. Stop outs by students were not recognized in the baccalaureate time-to-degree calculation.

Participants of the study were restricted to those individuals earning their first baccalaureate degree during the study time period as described in the delimitations. A data reduction algorithm was employed to recognize individuals earning two degrees in a single term (double majors). Only the participant's first baccalaureate award was recognized. Participants earning a baccalaureate degree (second degree) in subsequent years were only recognized for the first baccalaureate.

A data reduction algorithm (see Appendix D for complete details) was used to create two independent groups of MUS baccalaureate degree recipients: non-transfer students ($n = 6,517$) and transfer students from MUS two-year colleges ($n = 746$). Non-transfer students were chosen based upon the criteria that the individual began her education and was conferred the baccalaureate at the same MUS four-year college. The criteria for transfer students were that an individual began her education at an MUS two-year college and completed the baccalaureate at one of MUS four-year college. Transfer students from non-MUS two-year colleges were eliminated as participants of the transfer student group as described in the delimitations. These two groups of participants were selected in answering the study's primary research question of baccalaureate time-to-degree, research sub-questions 1-2, and research sub-questions 9-10. Observations used in answering research sub-questions 3-8 were based exclusively on participants from the transfer student group.

Salkind (2009) described research as a process where new knowledge is discovered. In describing the properties of high quality research, he stated “research is an activity that can be replicated ... one of the hallmarks of any credible scientific findings is that it can be replicated” (p. 3). The complete explanation of the queries and algorithms used in data reduction for developing groups of participants for this study are available (see Appendix D for complete details).

Baccalaureate time-to-degree.

The primary research question for the study asked, is there a difference in baccalaureate time-to-degree between non-transfer and transfer students in the MUS. Ordinal level descriptive statistics of time-to degree were compiled from the study’s participants across the six MUS institutions. Of the 7,263 participants purposely chosen for the study, two independent groups were observed: non-transfer students ($n = 6,517$) and transfer students ($n = 746$). Participants for the study were graduates conferred during the time period July 2013 through May 2016. Transfer students from the MUS two-year college system composed 8% of the participants.

Table 5 presents the frequency distribution of baccalaureate time-to-degree for non-transfer students and transfer students. The highest concentration of participants from the non-transfer student group (31%) completed the baccalaureate at the 4 year measurement, while the highest concentration among the transfer student group (18%) occurred at the 5 year measurement. At the 5 year mark, the cumulative frequency for baccalaureate time-to-degree of non-transfer students was 74%, while the transfer student group reached a similar cumulative frequency (73%) at the 7 year measurement. Higher percentages of participants from the transfer group (20%) needed more than 8 years to complete the baccalaureate than participants from the non-transfer group (6%).

Table 5.

Baccalaureate Time-to-Degree Frequency Distribution.

	Non-transfer students				Transfer students			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 4 years	563	9%	563	9%	16	2%	16	2%
4 years	1988	31%	2551	39%	48	6%	64	9%
4 years, 1 semester	1112	17%	3663	56%	78	10%	142	19%
5 years	1140	17%	4803	74%	132	18%	274	37%
5 years, 1 semester	487	7%	5290	81%	80	11%	354	47%
6 years	341	5%	5631	86%	86	12%	440	59%
6 years, 1 semester	209	3%	5840	90%	60	8%	500	67%
7 years	157	2%	5997	92%	46	6%	546	73%
7 years, 1 semester	78	1%	6075	93%	27	4%	573	77%
8 years	72	1%	6147	94%	22	3%	595	80%
More than 8 years	370	6%	6517	100%	151	20%	746	100%
Total	6517	100%	6517	100%	746	100%	746	100%

A notable characteristic identified in Table 5 is the large number of participants completing the baccalaureate degree in less than four years. In further analyzing other data from the MUS Data Warehouse, confounding values were found in several other fields, including null GPA values and total credit accumulation of less than 120 credits. As an example, 100 participants were discovered to have finished the baccalaureate degree in 2 years or less. These

values appear to be erroneous and the researcher has assumed it attributable to data entry errors, data collection errors, or data merging errors existing between the various MUS campuses and the MUS Data Warehouse. As a means to control the confounding effect of data errors, participants completing the degree in less than four years were eliminated. Further analyses, in investigating the primary research question, has been limited to participants completing the baccalaureate in four or more years.

Steinberg (2011) recommended the bar chart for displaying descriptive results from nonparametric and discrete sets. Figure 1 used a bar chart to compare cumulative frequency percentages in baccalaureate time-to-degree between the non-transfer student group and the transfer student group. Baccalaureate time-to-degree was limited to those participants completing the baccalaureate time-to-degree in 4 years or more.

Higher percentages of baccalaureate time-to-degree were observed at every measurement level and did not equalize until reaching the level of more than 8 years. At the 5 year mark, the graph for non-transfer students (74%) was nearly double the size of the graph of transfer students (37%).

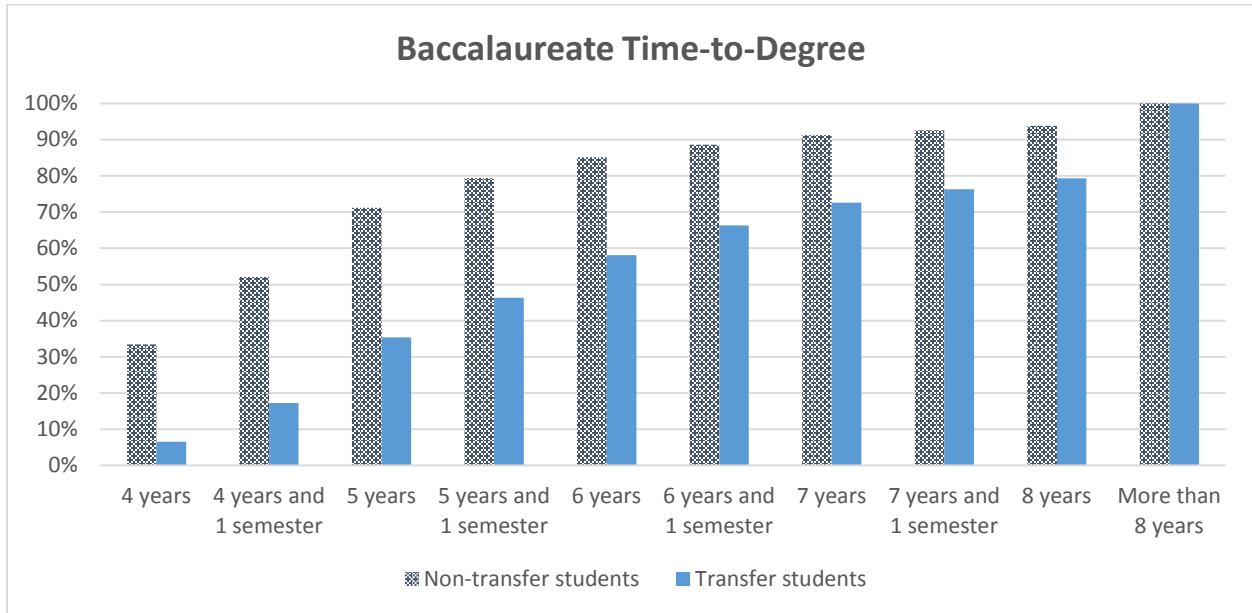


Figure 1. Baccalaureate Time-to-Degree. Baccalaureate time-to-degree of all participants using cumulative frequency percentages distributed by non-transfer students and transfer students. Adjusted to include all participants completing the baccalaureate in a minimum of 4 years.

Table 6 lists median baccalaureate time-to-degree for non-transfer students and transfer students across all MUS 4-year campuses. The median baccalaureate time-to-degree for non-transfer students was 4 years and 1 semester, while the median for MUS 2-year college transfer students was 6 years. Median baccalaureate time-to-degree for the non-transfer students varied by a single semester with a median measurement level of 5 years observed on four campuses and the measurement level of 4 years, 1 semester observed on two campuses (MSU-Bozeman and MSU-Northern). The median baccalaureate time-to-degree for transfer students varied by a single semester with the median measurement of 6 years observed at all campuses except MSU-Bozeman (Mdn = 5 years, 1 semester). MSU-Bozeman had the largest number of non-transfer participants (n = 2,764), while UM-Missoula had the largest number of transfer participants (n = 237).

Table 6.

Baccalaureate Time-to-Degree MUS Campus Comparison.

Campus	Non-transfer Students		Transfer Students	
	n	Mdn	n	Mdn
MSU-Billings	339	5 years	150	6 years, 1 semester
MSU-Bozeman	2,764	4 years, 1 semester	218	5 years and 1 semester
MSU-Northern	108	4 years, 1 semester	58	6 years
MT-Tech	198	5 years	39	6 years
UM-Missoula	2,298	5 years	237	6 years
UM-Western	246	5 years	28	6 years
Total	5,953	4 years, 1 semester	730	6 years

Note. Adjusted to include participants completing the baccalaureate in a minimum of 4 years.

The null hypothesis associated with the primary research question stated that no difference exists in baccalaureate time-to-degree between transfer students and non-transfer students. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The MWU value was found to be statistically significant ($U = 1,137,872$, $p < 0.001$, $r = 0.26$). The effect size between the non-transfer student group and the transfer student group was small. Based upon the *a priori* alpha value of 0.05 and $p < 0.001$, the null hypothesis was rejected. A statistically significant difference was observed in baccalaureate time-to-degree between non-transfer students and transfer students in the MUS. The median baccalaureate time-to-degree was longer for transfer students (Mdn = 6 years) than non-transfer students (Mdn = 4 years, 1 semester). The hypothesis for the primary research question has been

supported. A difference in baccalaureate time-to-degree between non-transfer and transfer students was observed in the MUS.

Baccalaureate credit accumulation.

Research sub-question 1 asked, is there a difference in credit accumulation between transfer and non-transfer students in the MUS? Baccalaureate credit accumulation was compared between two independent groups consisting of non-transfer students ($n = 6,515$) and transfer students ($n = 745$). Table 7 lists baccalaureate credit accumulation frequency distributions for both groups. The highest frequency for baccalaureate credit accumulation occurred in the 120-129 credits measurement level for both the non-transfer student group (32%) and the transfer student group (23%). More non-transfer student (65%) than transfer students (50%) experienced credit accumulations at the 139 credits or less level. A higher concentration of transfer student participants (21%) had baccalaureate credit accumulations at the 160 credits or more level than non-transfer students (11%).

Table 7.

Frequency Distribution of Baccalaureate Credit Accumulation for all Participants.

	Non-transfer students				Transfer students			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 120 credits	772	12%	772	12%	72	10%	72	10%
120 – 129 credits	2,083	32%	2855	44%	169	23%	241	32%
130 – 139 credits	1,393	21%	4248	65%	130	17%	371	50%
140 – 149 credits	958	15%	5206	80%	124	17%	495	66%
150 – 159 credits	574	9%	5780	89%	92	12%	587	79%
160 credits or more	735	11%	6515	100%	158	21%	745	100%
Total	6,514	100%	6514	100%	745	100%	745	100%

A large number of participants ($n = 844$) in the data were found to have credit accumulations of less than 120 credits the baccalaureate degree. These participants were confounding to the research question since the minimum credit accumulation required for the baccalaureate is 120 credits. Further analyses of the data has been limited to participants with baccalaureate credit accumulation of at least 120 credits.

Figure 2 compares frequency distribution percentages between the non-transfer and transfer groups. The shape of the frequency distribution illustrates a positive skew in distribution for non-transfer students, while the graph for the transfer student group graph exhibits a platykurtic kurtosis in distribution (Steinberg, 2011).

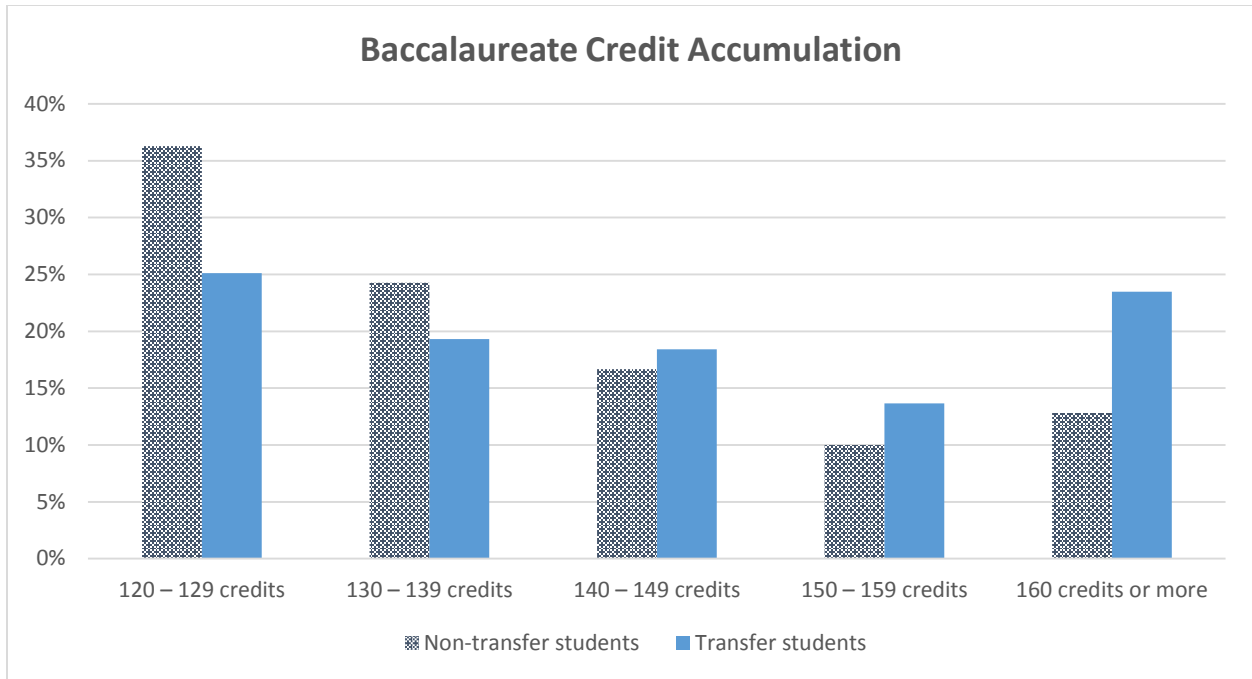


Figure 2. Baccalaureate Credit Accumulation. Baccalaureate credit accumulation for all participants using frequency percentages distributed by non-transfer students and transfer students. Limited to participants completing a minimum of 120 credits.

Table 8 examines baccalaureate credit accumulation of non-transfer students and transfer students across the MUS campus institutions. The median baccalaureate credit accumulation for non-transfer students was 130 – 139 credits, while the median credit accumulation for transfer students was 140 – 149 credits. Median baccalaureate credit accumulation across MUS campuses varied for non-transfer students with 130 – 139 credits on four campuses and 140 – 149 credits on two campuses, while median baccalaureate credit accumulation for transfer students varied from 139 (MSU-Billings) to 149 credits (MT-Tech).

Table 8.

Median Baccalaureate Credit Accumulation of All Participants across MUS Campuses.

Campus	Non-transfer Students		Transfer Students	
	n	Mdn	n	Mdn
MSU-Billings	364	130 – 139 credits	139	130 – 139 credits
MSU-Bozeman	2,748	130 – 139 credits	197	140 – 149 credits
MSU-Northern	110	130 – 139 credits	55	140 – 149 credits
MT-Tech	210	140 – 149 credits	38	140 – 149 credits
UM-Missoula	2,065	130 – 139 credits	221	140 – 149 credits
UM-Western	246	140 – 149 credits	24	140 – 149 credits
Total	5,743	130 – 139 credits	674	140 – 149 credits

Note. Limited to participants with minimum of 120 credits

The null hypothesis associated with the first research sub-question states that no difference exists in credit accumulation between non-transfer students and transfer students in the MUS. A Mann-Whitney U (MWU) test for non-parametric data was employed for statistical significance analysis. The MWU value was found to be statistically significant ($U = 1,558,665$, $p < 0.001$, $r = 0.10$). The effect size between the non-transfer student group and the transfer student group was small. Based upon the *a priori* alpha value of 0.05 and $p < 0.001$, the null hypothesis was rejected. A statistically significant difference was observed in credit accumulation between non-transfer and transfer students.

Based upon the descriptive and inferential statistical analyses of the data, it was concluded that transfer students had greater credit accumulation (Mdn = 140 – 149 credits) than non-transfer students (Mdn = 130 – 139 credits) and a statistically significant difference exists

between these two groups. The hypothesis for research sub-question 1 has been supported. A difference in baccalaureate credit accumulation between non-transfer students and transfer students was observed in the MUS.

Academic performance.

Research sub-question 2 asked, is there a difference in grade point average (GPA) between transfer students and non-transfer students? The baccalaureate cumulative GPA of two independent groups consisting of non-transfer students ($n = 6,517$) and transfer students ($n = 746$) were compared in analyzing academic performance to answer this sub-question. GPAs were categorized and examined as ordinal groups possessing the characteristics of rank and order, but lacking equidistant points and a zero-basis (Stevens, 1951).

Table 9 provides the frequency distribution of GPA among non-transfer students and transfer students. Minimal variation (no more than 2%) in frequency percentages between non-transfer students and transfer students were observed at all data measurement levels.

Table 9.

Grade Point Average (GPA) Frequency Distribution.

	Non-transfer students				Transfer students			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 2.00	4	0%	4	0%	0	0%	0	0%
2.00 – 2.49	229	4%	233	4%	24	3%	24	3%
2.50 – 2.99	1,465	22%	1698	26%	150	20%	174	23%
3.00 – 3.49	2,666	41%	4364	67%	311	42%	485	65%
3.50 – 4.00	2,153	33%	6517	100%	261	35%	746	100%
Total	6,517	100%	6517	100%	746	100%	746	100%

GPA scores for several participants ($n = 4$) was observed to be either null, 0, or less than 2.0. Graduation from the MUS requires a cumulative GPA of 2.0 or higher. The GPA values for these participants appear invalid and have been eliminated in further analyses of the data.

Figure 3 contains a bar chart illustrating median GPA values from non-transfer students and transfer students. The visual depiction of the data displayed nearly identical shape and size at all data measurement levels.

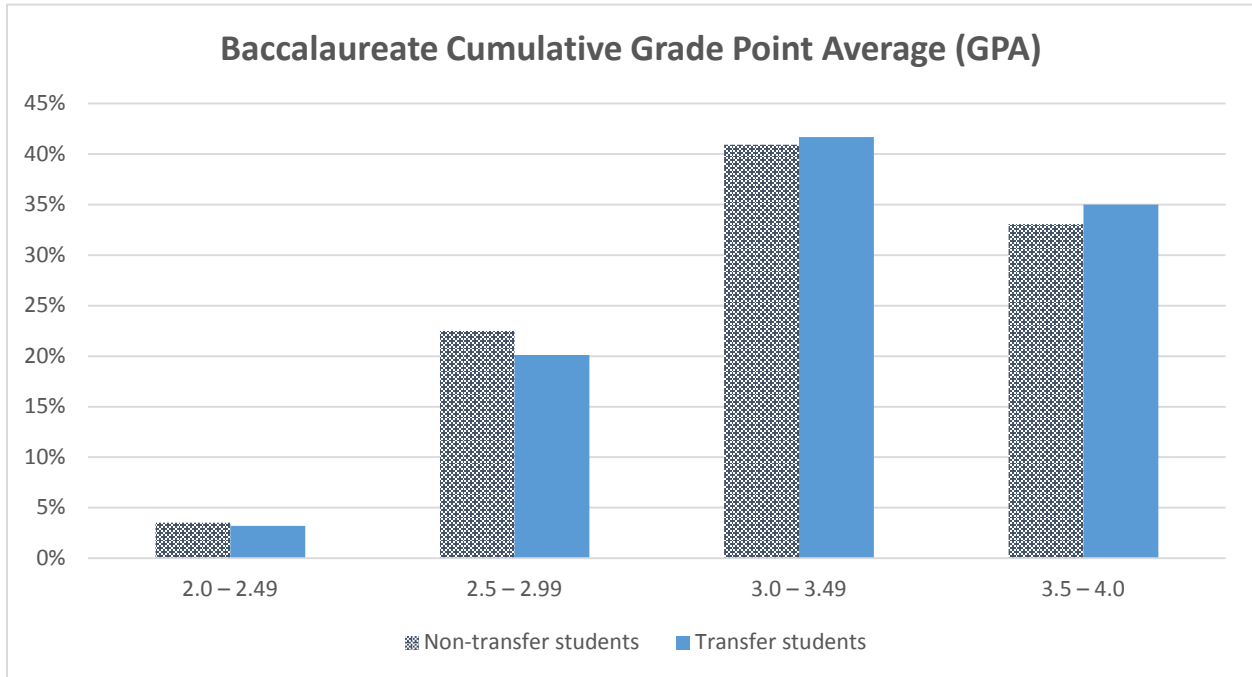


Figure 3. Grade Point Average. Grade Point Average (GPA) frequency percentages for all participants distributed by non-transfer and transfer students. Adjusted to participants with minimum 2.0 GPA.

Table 10 displays the median GPA measurement levels distributed across the six MUS campuses for non-transfer students and transfer students. The GPA measurements were observed at the same level for both groups across all MUS campuses.

Table 10.

Grade Point Average (GPA) Campus Comparison.

Campus	Non-transfer Students		Transfer Students	
	n	Mdn	n	Mdn
MSU-Billings	372	3.00 – 3.49	152	3.00 – 3.49
MSU-Bozeman	3097	3.00 – 3.49	221	3.00 – 3.49
MSU-Northern	119	3.00 – 3.49	60	3.00 – 3.49
MT-Tech	211	3.00 – 3.49	41	3.00 – 3.49
UM-Missoula	2458	3.00 – 3.49	244	3.00 – 3.49
UM-Western	256	3.00 – 3.49	28	3.00 – 3.49
Total	6513	3.00 – 3.49	746	3.00 – 3.49

Note. Adjusted to include participants with a minimum GPA of 2.0.

The null hypothesis associated with the second research sub-question states that no difference exists in GPA between non-transfer students and transfer students in the MUS. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The MWU value was not found to be statistically significant ($U = 2,335,903$, $p = 0.085$, $r = 0.02$). The effect size between the non-transfer and the transfer group was small. The *a priori* alpha value of 0.05 and $p = 0.085$, failed to reject the null hypothesis. A statistically significant difference was not observed in GPA between non-transfer and transfer students. Based upon an inferential statistical analysis of the MUS data from the study's time period, the third hypothesis stating that a difference in GPA between non-transfer and transfer students has been not observed.

Associate degree completion.

In the MUS, the Associate of Arts (AA) and Associate of Science (AS) degrees are described as transfer degrees. According to the Board of Regents, these degrees do not carry a title and require students to complete a minimum of 60 credits and the general education requirements for the baccalaureate degree (Montana Board of Regents, 2006). The curricula of the AA and AS degrees are designed for transfer students planning to complete the baccalaureate.

The Associate of Applied Science (AAS) degree is designed as a workforce education credential and its curricula is not designed for transfer to the baccalaureate degree (Montana Board of Regents, 2006). Although the curriculum contain some general education courses, the majority of the content is based upon career-technical education.

Transfer degrees: Time-to-completion

Research sub-question 3 asked, is there a difference in baccalaureate time-to-degree among transfer students that have completed the transfer associate degree (AA or AS) in the MUS? Two independent groups of participants were formed from the transfer participants (n = 746) identified in answering the primary research question. Baccalaureate time-to-degree for participants without the transfer degree (n = 664) were compared with participants that completed the transfer degree (n = 82). Table 11 Baccalaureate Time-to-Degree compares the frequency values of the two groups distributed by participants without the AA/AS transfer degree and participants with the AA/AS transfer degree.

Table 11.

Baccalaureate Time-to-Degree: AA/AS Degree Frequency Distribution.

	Without AA/AS degree				With AA/AS degree			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 4 years	15	2%	15	2%	1	1%	1	1%
4 years	47	7%	62	9%	1	1%	2	2%
4 years, 1 semester	69	10%	131	20%	9	11%	11	13%
5 years	122	18%	253	38%	10	12%	21	26%
5 years, 1 semester	69	10%	322	48%	11	13%	32	39%
6 years	75	11%	397	60%	11	13%	43	52%
6 years, 1 semester	54	8%	451	68%	6	7%	49	60%
7 years	43	6%	494	74%	3	4%	52	63%
7 years, 1 semester	23	3%	517	78%	4	5%	56	68%
8 years	19	3%	536	81%	3	4%	59	72%
More than 8 years	128	19%	664	100%	23	28%	82	100%
Total	664	100%	664	100%	82	100%	82	100%

The largest concentration of participants (18%) without the transfer degree completed the baccalaureate in 5 years, while the largest concentration of participants with the transfer degree varied in baccalaureate time-to-degree with fairly equal percentages (11% - 13%) ranging from 4 year, 1 semester to 6 years. Figure 5 provides a bar graph of baccalaureate time-to-degree comparing cumulative frequency percentages of these two groups of participants. The shape of

the graph is symmetric, but it did illustrate a shorter baccalaureate time-to-degree for transfer students without the AA/AS degree. The data indicated several participants completing the baccalaureate in less than four years. Further analyses has been limited to those students completing the baccalaureate in four years or more.

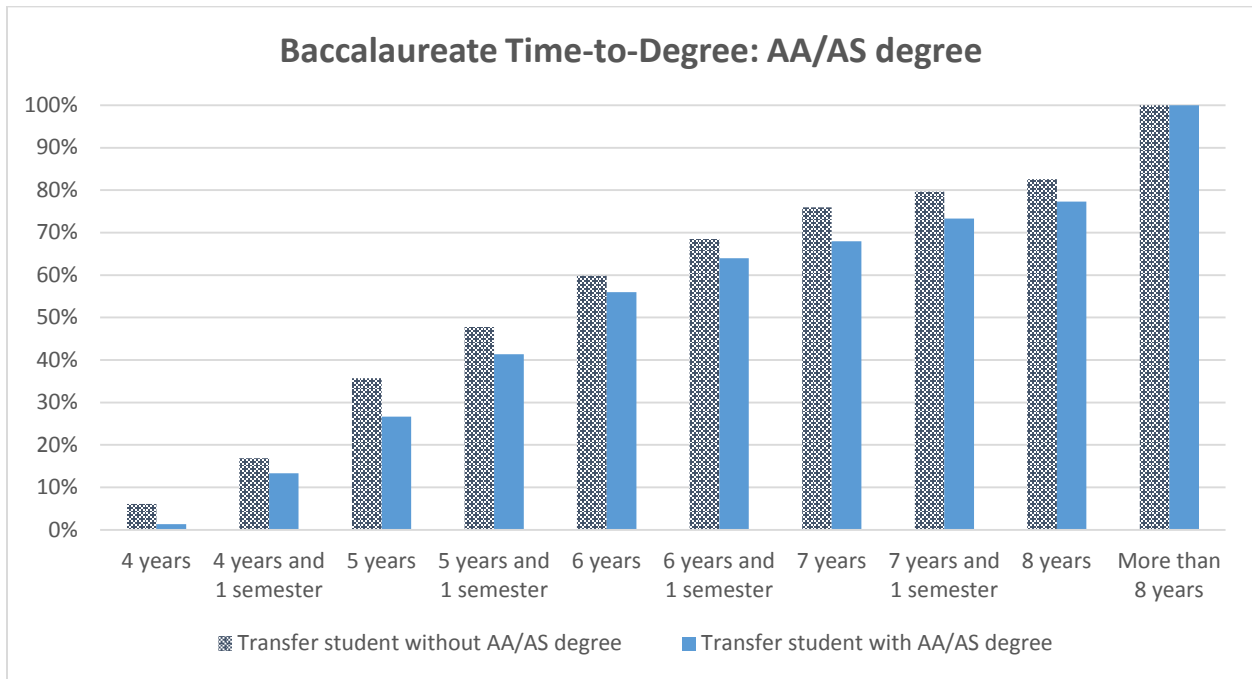


Figure 4. *Baccalaureate Time-to-Degree*. Baccalaureate time-to-degree cumulative frequency percentages of transfer students distributed by transfer students without the AA/AS transfer degree and transfer students with the AS/AS degree. Limited to participants completing a minimum of 4 years.

The median baccalaureate time-to-degree for both student groups was observed at 6 years. When compared across MUS 2-year college campuses, the median values varied from 5 years, 1 semester to 6 years for participants without the transfer degree, and 5 years, 1 semester to 6 years, 1 semester for participants with the transfer degree on all but one campus.

Table 12.

Baccalaureate Time-to-Degree: AA/AS Degree MUS Campus Comparison.

Campus	Without AA/AS degree		With AA/AS degree	
	n	Mdn	n	Mdn
City College	109	5 years, 1 semester	7	5 years, 1 semester
Great Falls College	138	6 years	41	6 years
Helena College	169	5 years, 1 semester	17	6 years, 1 semester
Highlands College	3	More than 8 years	1	More than 8 years
Missoula College	121	6 years	9	5 years, 1 semester
Total	540	6 years	75	6 years

Note. Limited to participants completing a minimum of 4 years.

The null hypothesis associated with the third research sub-question stated that no difference exists in baccalaureate time-to-degree between transfer students without the AA/AS transfer degree and transfer students with the AA/AS transfer degree. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The result of the MWU test was not found to be statistically significant ($U = 18,238.5$, $p = -0.16$, $r=0.06$). The effect size between the non-transfer and the transfer group was small. Based upon the *a priori* alpha value of 0.05, the analysis failed to reject the null hypothesis. A statistically significant difference was not observed in baccalaureate time-to-degree between transfer students without the AA/AS degree and transfer students with the AA/AS transfer degree. Inferential statistical analysis of the MUS data suggest that no difference in baccalaureate time-to-degree exists between those students completing the AA/AS degree and those transfer students that do not.

Transfer degrees: Credit accumulation.

Research sub-question 4 asked is there a difference in baccalaureate credit accumulation among transfer students that have completed the transfer associate degree (AA or AS) in the MUS? Two groups of participants were formed from the transfer participants (n = 746) identified in answering the primary research question. Baccalaureate credit accumulation for participants without the transfer degree (n = 664) were compared with participants that completed the transfer degree (n = 82). Table 13 lists frequency distributions of credit accumulation for the two participant groups. The largest frequency of participants without the transfer degree had credit accumulations of 120 – 129 credits (24%), while the largest frequency of participants with the transfer degree had credit accumulations of 160 or more credits (27%).

Table.13.

Baccalaureate Credit Accumulation: AA/AS Degree Frequency Distribution.

	Without AA/AS degree				With AA/AS degree			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 120 credits	66	10%	66	10%	6	7%	6	7%
120 – 129 credits	161	24%	227	34%	8	10%	14	17%
130 – 139 credits	120	18%	346	52%	11	13%	25	30%
140 – 149 credits	106	16%	452	68%	18	22%	43	52%
150 – 159 credits	75	11%	527	79%	17	21%	60	73%
160 credits or more	136	21%	663	100%	22	27%	82	100%
Total	664	100%	663	100%	82	100%	744	100%

Further analyses of the data have been limited to those students completing a minimum of 120 credits ($n = 568$). Figure 6 illustrates baccalaureate credit accumulation frequency distribution percentages. The highest frequency percentage of credit accumulation among participants without the AA/AS degree was 120-129 credits (27%), while the largest frequency percentage for participants with the AA/AS degree occurred at the measurement level of 160 credits or more. The distribution of credit accumulation among participants with the transfer degree possesses a negative skew as shown in Figure 6.

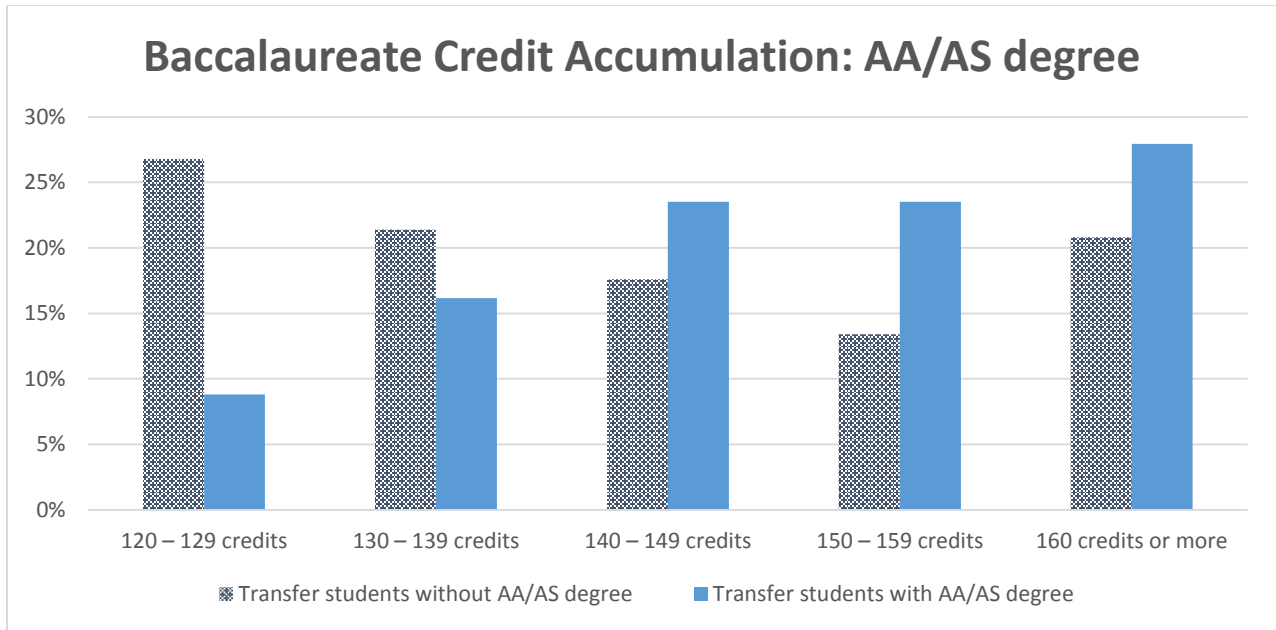


Figure 5. *Baccalaureate Credit Accumulation.* Baccalaureate credit accumulation for transfer students using frequency percentages distributed by transfer students without the AA/AS degree and transfer students with the AA/AS degree. Limited to participants completing a minimum of 120 credits.

Table 14 provides median baccalaureate credit accumulation for these two groups of participants distributed across MUS two-year college campuses. The median for participants without the transfer degree was the accumulation of 141 credits (n = 499), with median credit accumulation varying among campuses between 136 - 143 credits. The median for participants with the transfer degree was the accumulation of 150 -159 credits (n = 67), with median credit accumulation varying among campuses between 135.5 - 157 credits. Data for Highlands College were considered outliers as it consisted of a single participant with excessive credit accumulation.

Table 14.

Baccalaureate Credit Accumulation: AA/AS degree MUS Campus Comparison.

Campus	Without AA/AS degree		With AS/AS degree	
	n	Mdn	n	Mdn
City College	107	130 – 139 credits	4	140 – 149 credits
Great Falls College	127	140 – 149 credits	39	150 – 159 credits
Helena College	145	140 – 149 credits	16	150 – 159 credits
Highlands College	1	150 – 159 credits	1	160 credits or more
Missoula College	120	130 – 139 credits	8	130 – 139 credits
Total	500	140 – 149 credits	68	150 – 159 credits

Note. Limited to participants completing a minimum of 120 credits.

The null hypothesis associated with the fourth research sub-question stated that no difference exists in credit accumulation between transfer students without the AA/AS transfer degree and transfer students with the AA/AS transfer degree in the MUS. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The result of the MWU test was not found to be statistically significant ($U = 12,444$, $p < 0.001$, $r = -0.151$). The effect size between the non-transfer and the transfer group was small. Based upon the a priori alpha value of 0.05, the null hypothesis was rejected as a statistically significant difference was observed in credit accumulation between transfer students with the AA/AS transfer degree and students without the AA/AS transfer degree. Descriptive and inferential statistical analyses of the data suggested that students completing the AA/AS degree accumulate more credits than those that do not complete this transfer degree.

Non-transfer degrees: Baccalaureate time-to-degree.

Research sub-question 4 asked is there a difference in baccalaureate time-to-degree among transfer students that have completed the associate of applied science degree (AAS) in the MUS. Two groups of participants were formed from the transfer participants (n = 746) identified in answering the primary research question. Baccalaureate time-to-degree for participants without the AAS degree (n = 678) were compared with participants that completed the AAS degree (n = 68). Table 15 Baccalaureate Time-to-Degree, compares frequency values distributed by participants without the transfer degree and participants with the transfer degree for these two groups. Baccalaureate time-to-degree for the largest number of participants without the AAS degree measured 5 years (19%), while it took more than 8 years for the largest number of participants with the AAS degree (41%) to complete the baccalaureate.

Table 15.

Baccalaureate Time-to-Degree: AAS Degree Frequency Distribution.

	Without AAS degree				With AAS degree			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 4 years	16	2%	16	2%	0	0%	0	0%
4 years	44	6%	60	9%	4	6%	4	6%
4 years, 1 semester	74	11%	134	20%	4	6%	8	12%
5 years	126	19%	260	38%	6	9%	14	21%
5 years, 1 semester	76	11%	336	50%	4	6%	18	26%
6 years	81	12%	417	62%	5	7%	23	34%
6 years, 1 semester	54	8%	471	69%	6	9%	29	43%
7 years	43	6%	514	76%	3	4%	32	47%
7 years, 1 semester	21	3%	535	79%	6	9%	38	56%
8 years	20	3%	555	82%	2	3%	40	59%
More than 8 years	123	18%	678	100%	28	41%	68	100%
Total	678	100%	678	100%	68	100%	68	100%

Further analyses of the data were limited to students completing the baccalaureate in a minimum of 4 years. Figure 7 illustrates cumulative frequency distribution percentages between the two transfer student groups. The bar graph displayed symmetric characteristics for baccalaureate time-to-degree of participants without the AAS degree ($n = 552$), while the graph

of baccalaureate time-to-degree for participants with the AAS degree ($n = 61$) exhibited a slightly negative skew caused by a spike at the more than 8 years measurement level.

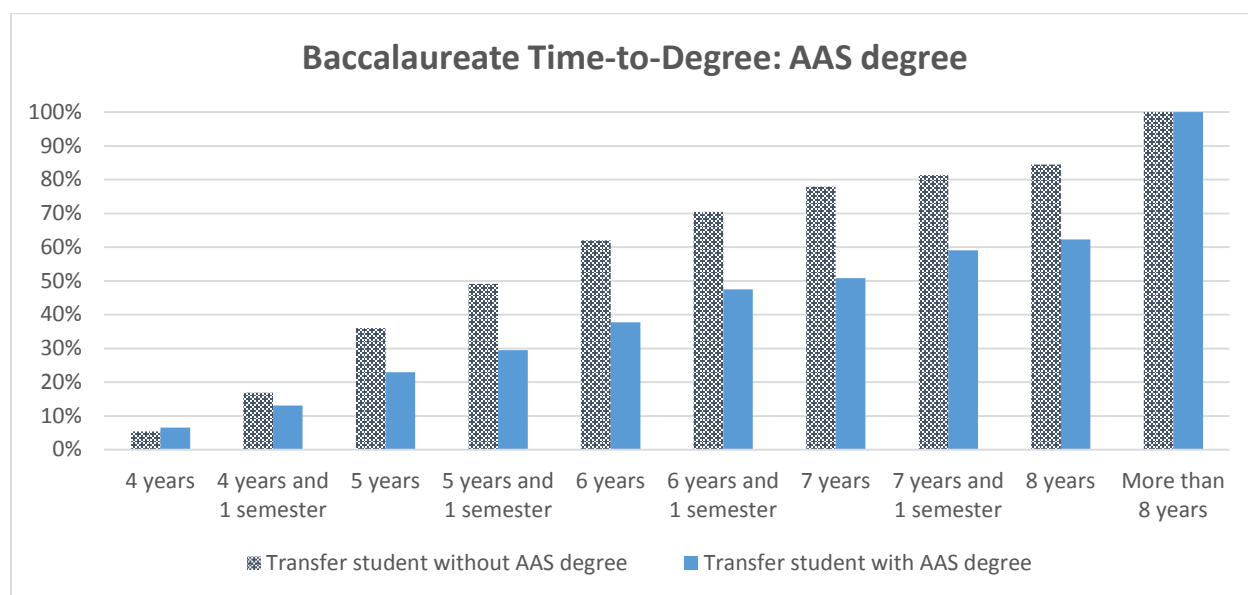


Figure 6. Baccalaureate Time-to Degree. Baccalaureate time-to-degree cumulative frequency percentages distributed by transfer students without the AAS degree and transfer students with the AAS degree. Limited to students completing the baccalaureate in a minimum of 4 years.

Table 16 displays median baccalaureate time-to-degree for the two groups of participants across MUS two-year campuses. The median baccalaureate time-to-degree for transfer students without the AAS degree was 6 years. The median baccalaureate time-to-degree with the AAS degree was 7 years. Median time-to-degree of transfer students without the AAS degree varied across campuses ranging from 5 years, 1 semester (City College, $n = 101$; Missoula College, $n = 121$; and Helena College, $n = 163$), to 6 years (Great Falls College, $n = 163$). Median time-to-degree of transfer students with the AAS degree varied across campuses ranging from 5 years (City College, $n = 13$) to 7 years, 1 semester (Great Falls College, $n = 16$).

Table 16.

Baccalaureate Time-to-Degree: AAS Degree MUS Campus Comparison.

Campus	Without AAS degree		With AAS degree	
	n	Mdn	n	Mdn
City College	101	5 years, 1 semester	13	5 years
Great Falls College	163	6 years	16	7 years, 1 semester
Helena College	163	5 years, 1 semester	23	6 years, 1 semester
Highlands College	4	More than 8 years	0	N/A
Missoula College	121	5 years, 1 semester	9	More than 8 years
Total	552	6 years	61	7 years

Note. Adjusted to include participants completing the baccalaureate in a minimum of 4 years.

The null hypothesis associated with research sub-question 5 stated that no difference exists in baccalaureate time-to-degree between transfer students without the AAS degree and transfer students with the AAS degree. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The result of the MWU test was found to be statistically significant ($U = 11,755.5$, $p < 0.001$, $r = -0.157$). The effect size between students without the AAS degree and student with the AAS was small. Based upon the a priori alpha value of 0.05, the null hypothesis was rejected as a statistically significant difference was observed in baccalaureate time-to-degree for transfer students with the AAS degree. Descriptive and inferential statistical analyses of the data suggested that in the MUS, a difference in baccalaureate time-to-degree exists between those transfer students completing the AAS degree and those transfer students that do not.

Non-transfer degree: Credit accumulation.

Research sub-question 6 asked is there a difference in baccalaureate credit accumulation among transfer students that have completed the associate of applied science degree (AAS) in the MUS. Two groups of participants were formed from the transfer participants group (n = 746) identified in answering the primary research question. Baccalaureate credit accumulation for participants without the AAS degree (n = 678) were compared with participants that completed the AAS degree (n = 68). Table 17 lists frequency distributions of credit accumulation for the two participant groups. The largest frequency of participants without the AAS degree had credit accumulations of 120 – 129 credits (24%), while the largest frequency of participants with the transfer degree had credit accumulations of 160 or more credits (41%).

Table.17.

Baccalaureate Credit Accumulation: AAS Degree Frequency Distribution.

	Without AAS degree				With AAS degree			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 120 credits	70	10%	70	10%	2	3%	2	3%
120 – 129 credits	161	24%	231	34%	8	12%	10	15%
130 – 139 credits	121	18%	352	52%	10	15%	20	29%
140 – 149 credits	113	17%	465	69%	11	16%	31	46%
150 – 159 credits	83	12%	548	81%	9	13%	40	59%
160 credits or more	130	19%	678	100%	28	41%	68	100%
Total	678	100%	678	100%	68	100%	68	100%

Further analyses of the data were limited to students completing a minimum of 120 credits. Figure 8 illustrates credit accumulation frequency percentages distributed by participants without the AAS degree and participants with the AAS degree. The noticeable characteristic in the data is the large frequency of participants with baccalaureate credit accumulations of 160 credits or more. This spike in the data exhibits a negative skew in the graph.

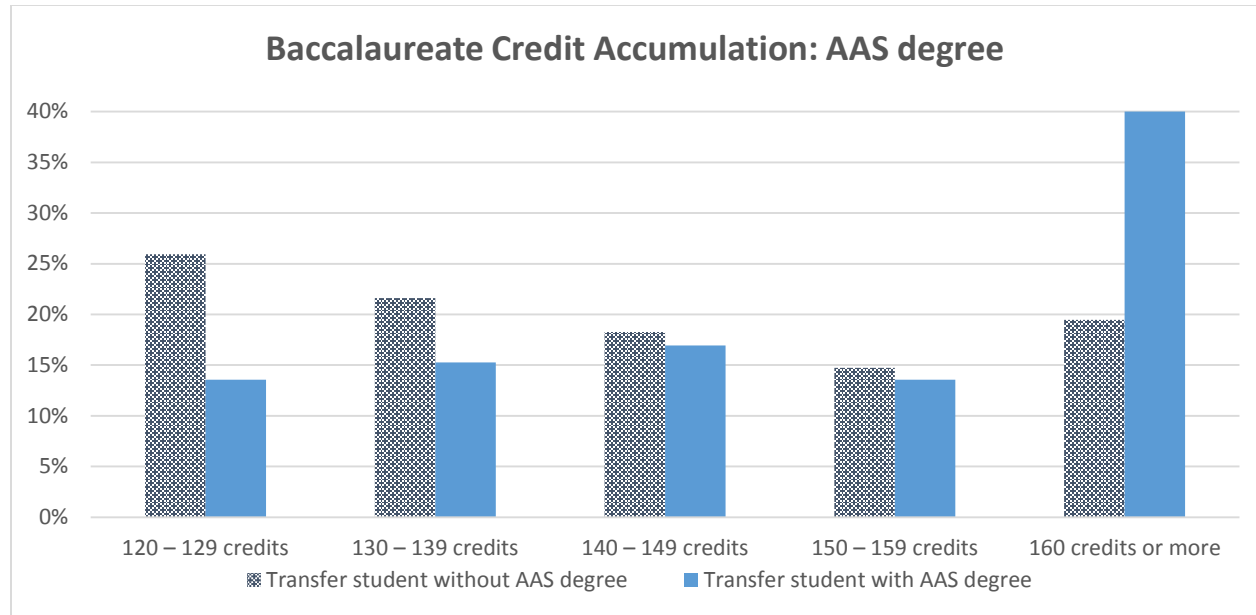


Figure 7. *Baccalaureate Credit Accumulation: AAS Degree*. Baccalaureate credit accumulation for transfer students without the AAS degree and transfer students with the AAS degree using frequency percentages. Limited to participants completing a minimum of 120 credits.

Table 18 displays median baccalaureate credit accumulation across the MUS campuses for the two participant groups. Median credit accumulation for transfer students without the AAS degree ranged in levels from 130 - 139 credits (Missoula College, n = 119; City College, n = 98) to 140 – 149 credits (Great Falls College, n = 151; Helena College, n = 139) across the MUS two-year campuses. Median baccalaureate credit accumulation for transfer students with the AAS degree varied in levels from 140 – 149 credits (City College, n = 13) to 160 credits or more (Missoula College, n = 9).

Table 18.

Median Baccalaureate Credit Accumulation for Transfer Students without the AAS Degree and Transfer Students with the AAS degree across MUS Two-year College Campuses

Campus	Without AAS degree		With AAS degree	
	n	Mdn	n	Mdn
City College	98	130 – 139 credits	13	140 – 149 credits
Great Falls College	151	140 – 149 credits	15	150 – 159 credits
Helena College	139	140 – 149 credits	22	Between 140-149 credits and 150 – 159 credits
Highlands College	2	160 credits or more	0	N/A
Missoula College	119	130 – 139 credits	9	160 credits or more
Total	509	140 – 149 credits	59	150 – 159 credits

Note. Limited to participants completing a minimum of 120 credits

The null hypothesis for research sub-question 6 stated that no difference exists in credit accumulation between transfer students without the AAS degree and transfer students with the AAS degree. A Mann-Whitney U (MWU) test for non-parametric data was employed in testing for statistical significance. The result of the MWU test was found to be statistically significant ($U = 10,442$, $p < 0.001$, $r = -0.161$). The effect size between the non-transfer and the transfer group was small. Based upon the *a priori* alpha value of 0.05, the null hypothesis was rejected as a statistically significant difference was observed in credit accumulation between transfer students with the AAS degree and transfer students without the AAS transfer degree. Analysis of the data suggested that in the MUS, transfer students completing the AAS degree in route to the baccalaureate accumulate more credits than those transfer students that do not.

Campus organization: Embedded and independent colleges.

The five MUS two-year colleges are organized as embedded colleges or independent colleges (Fisher & Cech, 2011). The embedded colleges are located on a separate campus, but structurally affiliated and governed within a regional university. They are located in the same community as a MUS four-year college.

Independent colleges have independent governance and report directly to one of the flagship universities. Independent colleges are located in communities without a MUS four-year institution. City College, Highlands College, and Missoula College are the three embedded colleges observed in the study. Great Falls College and Helena College are the two independent colleges observed in the study.

Baccalaureate time-to-degree.

Research sub-question 7 asked is there a difference in time-to-degree between transfer students from embedded two-year colleges and transfer students from independent two-year colleges in the MUS? Participants consisted of those transfer students identified in the primary research question from embedded colleges or independent colleges ($n = 620$). Transfer students from embedded colleges ($n = 250$) were compared with transfer students from independent colleges ($n = 370$). Table 19 displays frequency values distributed by the participants from embedded colleges and participant groups. The highest frequency percentages for baccalaureate time-to-degree occurred at the 5 year level (embedded colleges, 20%; independent colleges, 17%).

Table 19.

Baccalaureate Time-to-Degree: College Organization Frequency Distribution.

	Embedded College				Independent College			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 4 years	2	1%	2	1%	5	1%	5	1%
4 years	17	7%	19	8%	17	5%	22	6%
4 years, 1 semester	26	10%	45	18%	41	11%	63	17%
5 years	49	20%	94	38%	63	17%	126	34%
5 years, 1 semester	30	12%	124	50%	46	12%	172	46%
6 years	26	10%	150	60%	50	14%	222	60%
6 years, 1 semester	22	9%	172	69%	31	8%	253	68%
7 years	13	5%	185	74%	30	8%	283	76%
7 years, 1 semester	13	5%	198	79%	11	3%	294	79%
8 years	5	2%	203	81%	14	4%	308	83%
More than 8 years	47	19%	250	100%	62	17%	370	100%
Total	250	100%	250	100%	370	100%	746	100%

Further analyses of the data were limited to those students completing the baccalaureate in a minimum of four years. The bar chart in Figure 9 illustrates cumulative frequency percentages for baccalaureate time-to-degree for transfer students distributed by embedded colleges and independent colleges. The shape of the graph for both groups is symmetrical and nearly identical at all levels.

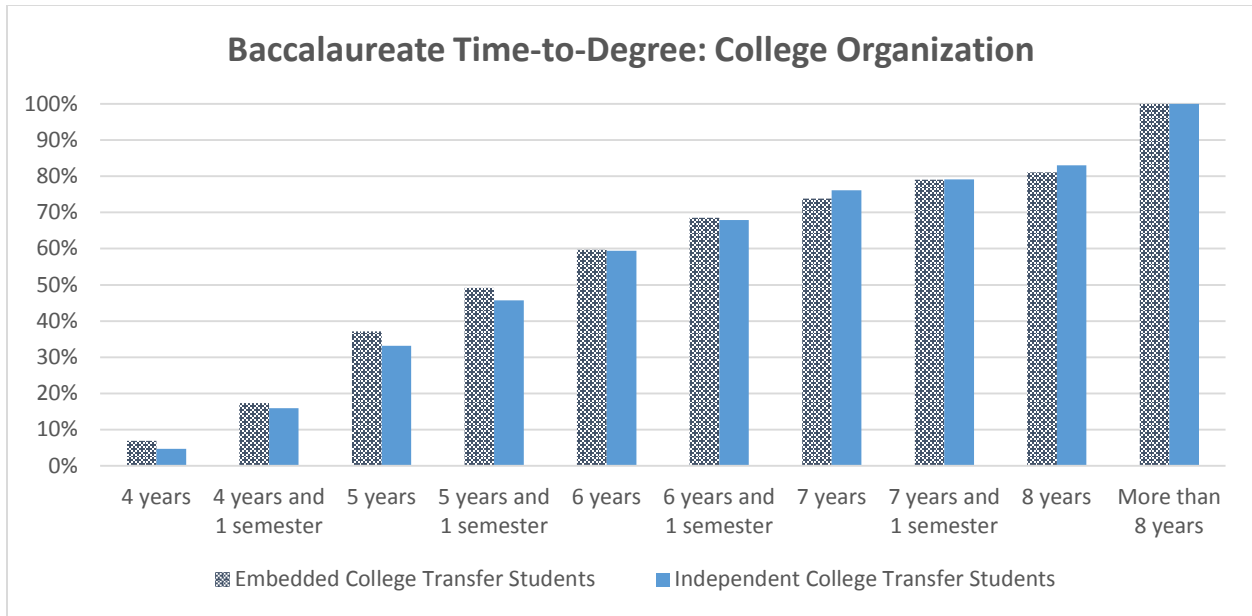


Figure 8. Baccalaureate Time-to-Degree: College Organization. Baccalaureate time-to-degree of transfer students. Cumulative frequency percentages distributed by embedded college transfer students and independent college transfer students. Adjusted to include participants completing the baccalaureate in a minimum of 4 years.

Table 20 displays median baccalaureate time-to-degree for embedded college transfer students and independent college transfer students distributed across the 4-year colleges in the MUS. The median baccalaureate time-to-degree for transfer students from both embedded and independent colleges was 6 years.

Table 20.

Baccalaureate Time-to-Degree: College Organization MUS Campus Comparison.

Campus	Embedded College		Independent College	
	n	Mdn	n	Mdn
MSU-Billings	96	5 years, 1 semester	25	7 years, 1 semester
MSU-Bozeman	9	5 years, 1 semester	157	5 years, 1 semester
MSU-Northern	2	11 years, 1 semester	46	6 years
MT-Tech	3	More than 8 years Between 5 years, 1 semester and 6 years	34	6 years
UM-Missoula	136	7 years, 1 semester	79	6 years, 1 semester Between 5 years, 1 semester and 6 years
UM-Western	2	1 semester	24	6 years
Total	248	6 years	365	6 years

Note. Adjusted to include all participants completing the baccalaureate in a minimum of 4 years.

The null hypothesis associated with research sub-question 7 stated that no difference exists in baccalaureate time-to-degree between transfer students from embedded colleges and transfer students from independent colleges. A Mann-Whitney U (MWU) test for non-parametric data was employed in testing for statistical significance. The result of the MWU test was not found to be statistically significant ($U = 43,993.5$, $p = 0.554$, $r = -0.024$). The effect size between these transfer student groups was small. Based upon the *a priori* alpha value of 0.05 and $p = 0.592$, the null hypothesis was not rejected as a statistical significant result was not observed. Inferential statistical analysis of the data suggested that in the MUS, no statistically significant difference exists in baccalaureate time-to-degree exists between transfer students attending embedded colleges or students attending independent colleges.

Credit accumulation.

Research sub-question 8 asked is there a difference in credit accumulation between transfer students from embedded two-year colleges and transfer students from independent two-year colleges in the MUS? Participants consisted of those transfer students identified in the primary research question from embedded colleges or independent colleges (n = 620). Transfer student participants from embedded colleges (n = 250) were compared with transfer student participants from independent colleges (n = 370). Table 21 displays frequency values for baccalaureate credit accumulation distributed by participants from embedded colleges and participants from independent colleges. The highest frequency percentages for baccalaureate credit accumulation occurred at the 120-129 credit level for participants from embedded colleges (38%). Baccalaureate credit accumulation for transfer students from independent colleges (17%) occurred at the less than 120 credit measurement level (68%). The large number of participants recorded in this category is confounding to this research question.

A possible explanation could involve accurate recording of transfer credit in data tracking systems between independent colleges and 4-year institutions. Embedded colleges are different in that they are part of the same tracking system as a 4-year college, while independent colleges are disconnected from 4-year colleges and maintain their own data tracking systems. The explanation is likely due to errors in data exchanged between these isolated systems. Further analyses of the data were limited to those students completing the baccalaureate in a minimum of four years.

Table 21.

Baccalaureate Credit Accumulation: College Organization Frequency Distribution.

	Embedded College				Independent College			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 120 credits	18	7%	18	7%	250	68%	250	68%
120 – 129 credits	96	38%	114	46%	54	15%	304	82%
130 – 139 credits	55	22%	169	68%	32	9%	336	91%
140 – 149 credits	40	16%	209	84%	20	5%	356	96%
150 – 159 credits	21	8%	230	92%	8	2%	364	98%
160 credits or more	20	8%	250	100%	6	2%	370	100%
Total	250	100%	250	100%	370	100%	370	100%

Figure 10 illustrates baccalaureate credit accumulation frequency distribution percentages of participants from embedded and independent colleges. The bar chart illustrates similar shape and distribution between the two groups.

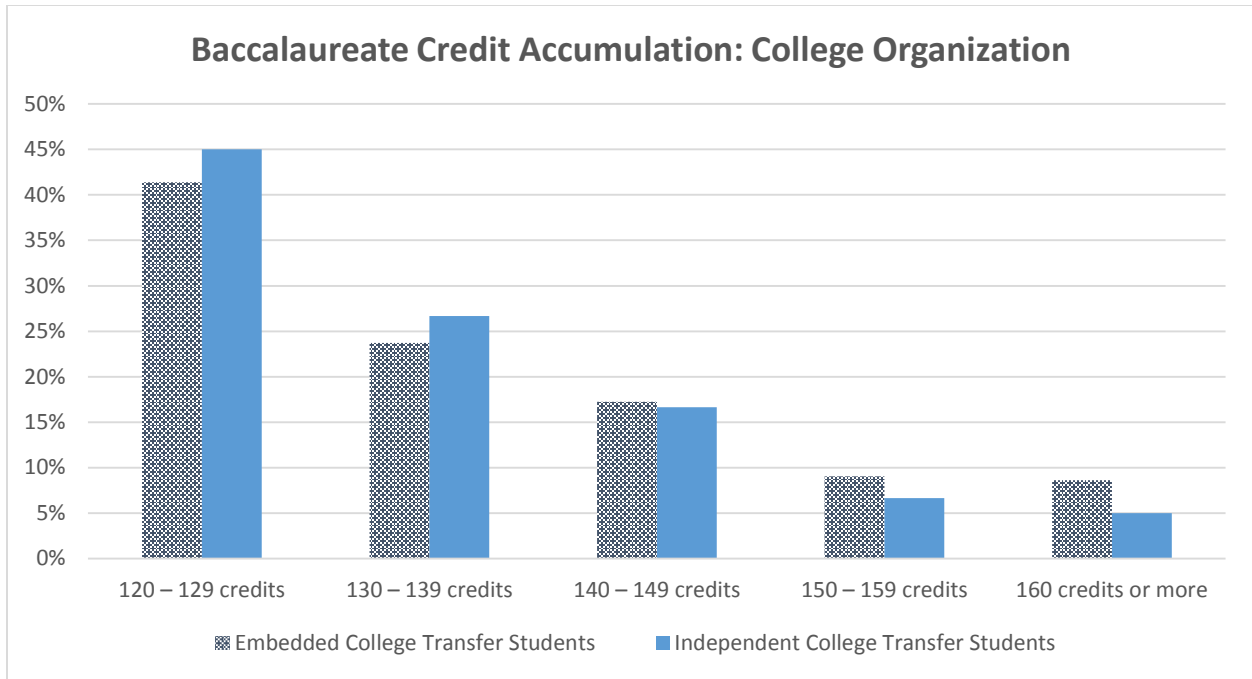


Figure 9. Baccalaureate Credit Accumulation: College Organization. Baccalaureate credit accumulation for transfer students with frequency percentages distributed by embedded and independent colleges. Limited to participants completing a minimum of 120 credits (n = 352).

Table 22 tallies median baccalaureate credit accumulation for the two participant groups. The median baccalaureate credit accumulation was observed at the 130 – 139 credits level for embedded college transfer students and independent college transfer students. Slight variation (120 – 129 credits) was seen among the independent college transfer students on the MSU-Billings (n = 1) and MSU-Northern (n = 8) campuses, but these results are based upon very small participant groups.

Table 22.

Baccalaureate Credit Accumulation: College Organization MUS Campus Comparison.

Campus	Embedded College		Independent College	
	n	Mdn	n	Mdn
MSU-Billings	94	130 – 139 credits	1	120 – 129 credits
MSU-Bozeman	7	130 – 139 credits	65	130 – 139 credits
MSU-Northern	2	130 – 139 credits	8	120 – 129 credits
MT-Tech	0	N/A	16	130 – 139 credits
UM-Missoula	128	130 – 139 credits	21	130 – 139 credits
UM-Western	1	130 – 139 credits	9	130 – 139 credits
Total	232	130 – 139 credits	120	130 – 139 credits

Note: Limited to participants completing a minimum of 120 credits.

The null hypothesis for research sub-question 8 stated that no difference exists in credit accumulation between transfer students attending embedded two-year colleges and transfer students attending independent two-year colleges. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The result of the MWU test was not found to be statistically significant ($U = 13,823.5$, $p = 0.915$, $r = -0.006$). The effect size between these two groups was small. Based upon the *a priori* alpha value of 0.05, the null hypothesis was not rejected. Based upon inferential statistical analysis, a statistically significant difference was not observed in median credit accumulation for transfer students from MUS embedded two-year colleges and transfer students from MUS independent two-year colleges in completing the baccalaureate degree.

Nontraditional student status.

Students of a nontraditional age are typically tasked with additional family and financial responsibilities that are not found among students of a traditional age (Bean & Metzner, 1985). For the purposes of this study, students over the age of 24 years old have been identified as nontraditional students (Bean & Metzner, 1985). In examining baccalaureate time-to-degree for nontraditional age students in the MUS, it was observed that 54% of participants selected as transfer students (n = 746) for the primary research question were of nontraditional age (n = 401), while 21% of participants selected as non-transfer students (n = 6517) for the primary research question were of nontraditional age (n = 1352). Higher percentages of transfer students are of nontraditional age.

Baccalaureate time-to-degree.

Table 24 lists frequency distribution of baccalaureate time-to-degree for non-transfer students of a nontraditional age and transfer students of a nontraditional age. Baccalaureate time-to-degree for these groups are different than traditional students with the highest frequency percentages was found to be at the more than 8 years level (non-transfer students, 27%; transfer students, 38%).

Table 23.

Baccalaureate Time-to-Degree for Participants of Nontraditional Age

	Non-transfer, nontraditional age				Transfer, nontraditional age			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 4 years	93	7%	93	7%	8	2%	8	2%
4 years	65	5%	158	12%	18	4%	26	6%
4 years, 1 semester	78	6%	236	17%	18	4%	44	11%
5 years	86	6%	322	24%	35	9%	79	20%
5 years, 1 semester	105	8%	427	32%	21	5%	100	25%
6 years	101	7%	528	39%	31	8%	131	33%
6 years, 1 semester	161	12%	689	51%	42	10%	173	43%
7 years	146	11%	835	62%	33	8%	206	51%
7 years, 1 semester	76	6%	911	67%	23	6%	229	57%
8 years	72	5%	983	73%	21	5%	250	62%
More than 8 years	369	27%	1352	100%	151	38%	401	100%
Total	1,352	100%	1,352	100%	401	100%	746	100%

Further analyses of the data were limited to those students completing the baccalaureate in four or more years. Figure 10 provides a bar graph containing frequency distribution between the two groups of nontraditional students. The graph illustrated similar characteristics of shape and distribution in comparing the two groups.

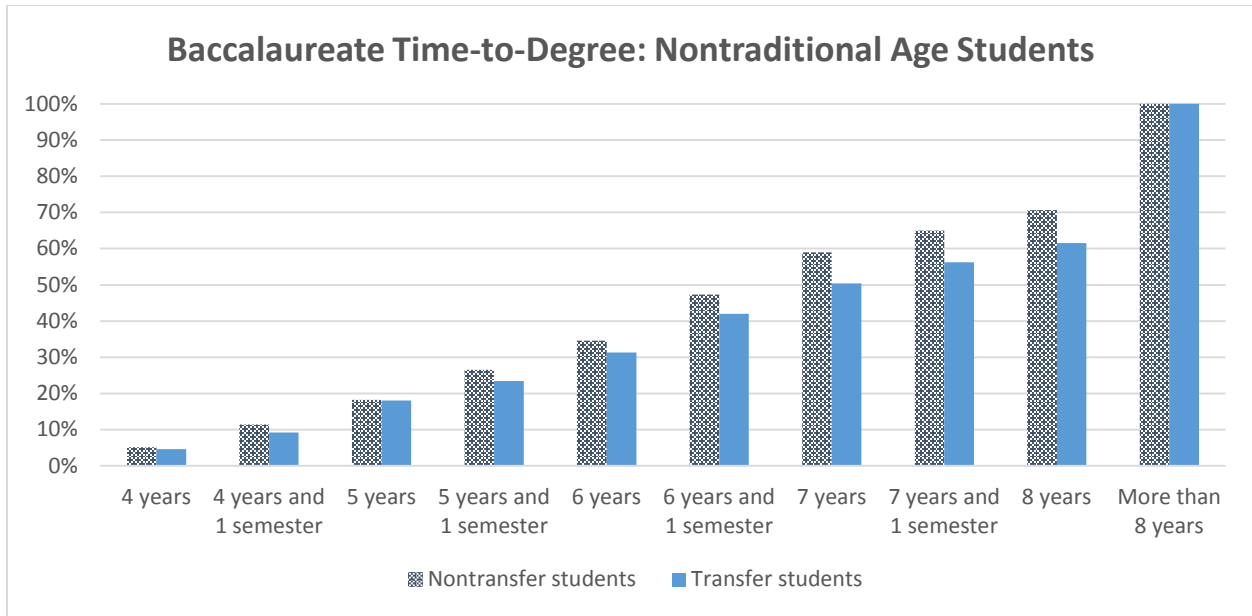


Figure 10. *Baccalaureate Time-to-Degree*. Baccalaureate time-to-degree for all participants of nontraditional age using cumulative frequency percentages distributed by non-transfer and transfer student. Adjusted to include all participants completing a minimum of 4 years.

Table 24 lists the baccalaureate time-to-degree frequencies for non-transfer and transfer students of nontraditional age across the MUS campuses. The median baccalaureate time-to-degree for both groups was 7 years. The MUS flagship institutions had nearly equal numbers of nontraditional age, transfer students (MSU-Bozeman, n = 78; UM-Missoula, n = 95), with UM-Missoula serving a slightly higher number of nontraditional age, non-transfer students (MSU-Bozeman, n = 492; UM, n = 520).

Table 24.

Baccalaureate Time-to-Degree: Nontraditional Age MUS Campus Comparison.

Campus	Nontraditional age, non-transfer students		Nontraditional age, transfer students	
	n	Mdn	n	Mdn
MSU-Billings	149	6 years, 1 semester	95	7 years, 1 semester
MSU-Bozeman	452	7 years	78	7 years
MSU-Northern	20	6 years, 1 semester	38	8 years
MT-Tech	60	Between 6 years and 6 years, 1 semester	29	6 years, 1 semester
UM-Missoula	520	7 years	137	7 years
UM-Western	59	6 years, 1 semester	16	Between 7 years and 7 years, 1 semester
Total	1,260	7 years	393	7 years

Note. Adjusted: to include all participants completing a minimum of 4 years.

The null hypothesis associated with research sub-question 9 stated that no difference exists in baccalaureate time-to-degree between non-transfer students of a nontraditional age and transfer students of a nontraditional age. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The result of the MWU test was found to be statistically significant ($U = 225,751.5$, $p = 0.008$, $r = -0.0652$). The effect size between these transfer student groups was small. Based upon the a priori alpha value of 0.05, the null hypothesis was rejected. A statistically significant difference was observed between non-transfer students of a nontraditional age and transfer students of a nontraditional age.

The descriptive statistical analysis indicated that median baccalaureate time-to-degree was the same between the two groups, but the adjusted distribution found an unusually large

frequency percentages for participants from both the non-transfer group (29%) and the transfer group (38%) in the non-transfer in the upper measurement level of more than 8 years. Since width of this measurement level varies, caution should be exercised in interpreting the inferential results of statistical significance as the descriptive statistic of median baccalaureate time-to-degree is the same in comparing transfer non-transfer students of nontraditional age and transfer students of nontraditional age.

Credit accumulation.

Research sub-question 10 asked is there a difference in baccalaureate credit accumulation between non-transfer students of nontraditional age and transfer students of nontraditional age. Two independent groups of participants of nontraditional age were selected from the associated participant groups of non-transfer students ($n = 6,517$) and transfer students ($n = 746$) used for research sub-question 2. Non-transfer students of nontraditional age ($n = 1,352$) were compared with transfer students of nontraditional age ($n = 401$). Table 25 displays frequency values for baccalaureate credit accumulation among participants of the two groups. The highest frequency percentages for baccalaureate credit accumulation occurred at the 120-129 credit level among participants of the non-transfer student of nontraditional age (37%). Baccalaureate credit accumulation of less than 120 credits measurement (49%) was observed to be the highest frequency level for transfer students of nontraditional age. The large number of participants recorded in this category is confounding as the minimum number of credits to complete the baccalaureate in the MUS is 120 credits. These values could be caused by inaccuracies in recording previous credit accumulation earned by students of non-traditional age through data tracking systems. It could also result from credit from other life experiences such as prior learning assessment, military service credit, or transfer from other academic institutions. Further

analyses of the data were limited to those students completing the baccalaureate in a minimum of four years

Table.25.

Baccalaureate Credit Accumulation: Nontraditional Age Frequency Distribution.

	Nontraditional age, non-transfer students				Nontraditional age, transfer students			
	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent	Frequency	Percent	Cumulative Frequency	Cum. Freq. Percent
Less than 120 credits	145	11%	145	11%	197	49%	197	49%
120 – 129 credits	502	37%	647	48%	80	20%	277	69%
130 – 139 credits	249	18%	896	66%	45	11%	322	80%
140 – 149 credits	183	14%	1079	80%	34	8%	356	89%
150 – 159 credits	126	9%	1205	89%	20	5%	376	94%
160 credits or more	147	11%	1352	100%	25	6%	401	100%
Total	1352	100%	1352	100%	401	100%	401	100%

Figure 11 provides a bar graph of baccalaureate degree credit accumulation with frequency percentages distributed between non-transfer students of nontraditional age and transfer students of nontraditional age. The highest frequency percentages for nontraditional age students occur at the 120-129 credit level for non-transfer students (42%) and transfer students (39%).

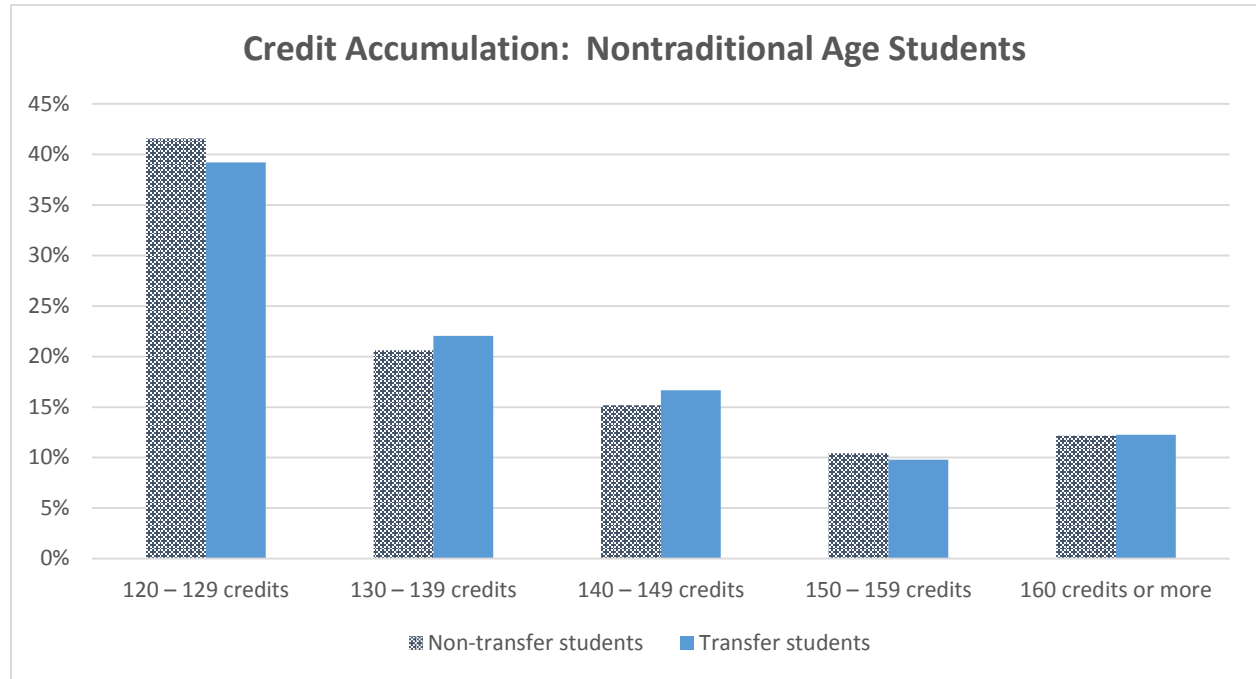


Figure 11 Baccalaureate Credit Accumulation. Baccalaureate credit accumulation for students of nontraditional age using frequency percentages distributed by non-transfer and transfer students. Adjusted to include all participants completing at least 120 credits.

Table 26 lists baccalaureate credit accumulation of nontraditional age participants across the MUS. The median baccalaureate credit accumulation among nontraditional age students was at the 130 - 139 credit level for the both the non-transfer and transfer participant groups. The median baccalaureate credit accumulation for non-transfer students varied from the 120 – 129 credit level (MSU-Bozeman) to the 150 – 159 credit level (UM-Western). The median baccalaureate credit accumulation for transfer students varied from the 130 – 139 credit level (MSU-Northern) to 140 – 149 credit level (UM-Missoula).

Table 26.

Baccalaureate Credit Accumulation: Nontraditional Age MUS Campus Comparison.

Campus	Nontraditional age, non-transfer students		Nontraditional age, transfer students	
	n	Mdn	n	Mdn
MSU-Bozeman	160	120 – 129 credits	63	130 – 139 credits
UM-Missoula	451	130 – 139 credits	25	140 – 149 credits
MSU-Billings	17	130 – 139 credits	8	130 – 139 credits
MSU-Northern	58	150 – 159 credits	10	130 – 139 credits
MT-Tech	465	130 – 139 credits	94	130 – 139 credits
UM-Western	56	140 – 149 credits	4	130 – 139 credits
Total	1207	130 – 139 credits	204	130 – 139 credits

Note. Adjusted to include participants completing at least 120 credits.

The null hypothesis for research sub-question 10 stated that no difference exists in credit accumulation between non-transfer students of a nontraditional age and transfer students of a nontraditional age in completing the baccalaureate. A Mann-Whitney U (MWU) test for non-parametric data was employed in determining statistical significance. The result of the MWU test was not found to be statistically significant ($U = 119,782$, $p = 0.535$, $r = -0.016$). The effect size between these two groups was small. Based upon the *a priori* alpha value of 0.05, the null hypothesis was not rejected. No statistically significant difference was observed in baccalaureate credit accumulation in the MUS for non-transfer students of a nontraditional age and transfer students of a nontraditional age.

Summary of Results

Based upon the graduate data available from the MUS Data Warehouse for the time period July 2013 through May 2016, it was determined that a difference in baccalaureate time-to-degree exists between non-transfer students and MUS two-year college transfer students in the MUS. Median baccalaureate time-to-degree between non-transfer students (4 years, 1 semester) and transfer students (6 years) differed. A statistically significant difference was observed.

Median baccalaureate credit accumulation was different among transfer students (140 – 149 credit level) and non-transfer students (130 - 139 credit level). A statistically significance difference was observed between these two groups. Academic performance as measured in cumulative grade point average (GPA) was observed to be identical between these two groups (non-transfer students, Mdn = 3.00 – 3.49 level; transfer students, Mdn = 3.00 – 3.49 level) with no statistically significant difference observed. Table 27 provides a summary of findings for the hypotheses of the primary research question and the research sub-questions 1 and 2.

Table 27.

Findings: Primary Research Question and Research Sub-questions 1-2

Research Question	Hypotheses	Summary of Finding
Primary	H ₁	Baccalaureate time-to-degree was longer for transfer students (Mdn = 6 years, n = 730, mean rank = 4,761) than non-transfer students (Mdn = 4 years, 1 semester, n = 5,953, mean rank = 3,169), U = 1,137,872, p<0.001, r = 0.26.
Sub-question 1	H ₂	Baccalaureate credit accumulation was greater for transfer students (Mdn = 140 - 149 credits, n = 674, mean rank = 3,768) than non-transfer students (Mdn = 130 - 139 credits, n = 5,743, mean rank = 3,143), U = 1,558,665, p<0.001, r = 0.10.
Sub-question 2	H ₃	No statistically significant difference in academic performance was observed between transfer students (Mdn = 3.00 – 3.49, n = 746, mean rank = 3,755) and non-transfer students (Mdn = 3.00 – 3.49, n = 6,513, mean rank = 3,616).

Completion of associate degrees among baccalaureate graduates were examined. Median baccalaureate time-to-degree for students with AA/AS transfer degree was the same as students without the AA/AS transfer degree (6 years), while median time-to-degree for students with the AAS degree (7 years) differed from students without the AAS degree (6 years). A statistically significant difference in time-to-degree was observed in students with AAS degrees, while no statistically significant difference was found in students with AA/AS transfer degrees.

Baccalaureate credit accumulation varied between transfer students without the AA/AS degree (140 - 149 credit level) and transfer students with the AA/AS degree (150 – 159 credit level). A statistically significant difference was observed in these two groups. Baccalaureate credit accumulation differed between transfer students without the AAS degrees (140 - 149

credit level) and transfer students with the AAS degree (150 - 159 credit level). A statistically significant difference was noted between these two groups. Table 28 provides a summary of findings for sub-questions 3-6 related to associate degree completion.

Table 28.

Findings: Research Sub-questions 3-10

Research Question	Hypotheses	Summary of Finding
Sub-question 3	H ₄	No statistically significant difference in baccalaureate time-to-degree was observed between transfer students with the AA/AS transfer degree (Mdn = 6 years, n = 75, mean rank = 334) and those without (Mdn = 6 years, n = 540, mean rank = 304).
Sub-question 4	H ₅	Baccalaureate credit accumulation was greater for transfer students with the AA/AS transfer degree (Mdn = 150 – 159 credits, n = 68, mean rank = 352) than without (Mdn = 140 – 149 credits, n = 500, mean rank = 275), U = 12,444, p < 0.001, r = -0.151.
Sub-question 5	H ₆	Baccalaureate time-to-degree was longer for transfer students with the AAS degree (Mdn = 7 years, n = 61, mean rank = 390) than without (Mdn = 6 years, n = 552, mean rank = 298), U = 11,755, p < 0.001, r = -0.157.
Sub-question 6	H ₇	Baccalaureate credit accumulation was greater for transfer students with the AAS degree (Mdn = 150 – 159 credits, n = 59, mean rank = 362) than without (Mdn = 140 – 149 credits, n = 509, mean rank = 276), U = 10,442, p < 0.001, r = -0.161.

Median baccalaureate time-to-degree for non-transfer students (7 years) and transfer students (7 years) were the same for students of nontraditional age in the MUS. Confounding was the discovery that a statistically significant difference in baccalaureate time-to-degree

between non-transfer students and transfer students of nontraditional age. Median baccalaureate credit accumulation was measured to be the same for non-transfer students (130 – 139 credit level) and transfer students (130 – 139 credit level) among students of a nontraditional age in the MUS. A statistically significant difference was not observed. Table 29 summarizes the results of research sub-questions 9-11.

Table 29.

Findings: Research Sub-questions 7-10

Research Question	Hypotheses	Summary of Finding
Sub-question 7	H ₈	No statistically significant difference in baccalaureate time-to-degree was observed between transfer students from independent colleges (Mdn = 6 years, n = 365, mean rank = 310) and those from embedded colleges (Mdn = 6 years, n = 248, mean rank = 301).
Sub-question 8	H ₉	No statistically significant difference in baccalaureate credit accumulation was observed between transfer students from independent colleges (Mdn = 130 – 139 credits, n = 232, mean rank = 176) and those from embedded colleges (Mdn = 130 – 139 credits, n = 120, mean rank = 177).
Sub-question 9	H ₁₀	For students of nontraditional age, a statistically significant difference was observed in baccalaureate time-to-degree for transfer students (Mdn = 7 years, n = 393, mean rank = 882) and non-transfer students (Mdn = 7 years, n = 1,260, mean rank = 809), U = 225,271.5, p = 0.008, r = -0.065.
Sub-question 10	H ₁₁	For students of nontraditional age, no statistically significant difference was observed in baccalaureate credit accumulation for transfer students (Mdn = 130 – 139 credits, n = 204, mean rank = 722) and non-transfer students (Mdn = 130 – 139 credits, n = 1,207, mean rank = 703).

Chapter Five: Conclusions and Recommendations

In this chapter, the conclusions and recommendations of the study will be discussed as follows: The findings will be presented as conclusions with respect to the original hypotheses of the primary research question and the 10 research sub-questions of the study. Strengths of the methodology and the findings of the study will be examined along with recommendations for future research. The significance of the study and its contributions to the research literature will be described. Lastly, recommendations based upon the results of the study will be presented.

Conclusions of the Original Hypotheses

The hypothesis (H_1) for the primary research question of the study stated that there is a statistically significant difference in baccalaureate time-to-degree between transfer students and non-transfer students in the Montana University System (MUS). Based upon the observation of a census of MUS participants ($n = 6517$) during the time period July 2013 – May 2016, the hypothesis (H_1) has been supported. The findings indicate that a statistically significant difference exists in the median baccalaureate time-to-degree for transfer students ($n = 730$, Mdn = 6 years) and non-transfer students ($n = 5963$, Mdn = 4 years, 1 semester). Students choosing the MUS 2-year college system experienced longer baccalaureate degree time-to-completion. The findings also supported research hypothesis H_2 as a statistically significant difference exists in baccalaureate credit accumulation between transfer students (Mdn = 140 – 149 credit level) and non-transfer students (Mdn = 130 – 139 credit level). The effect size was observed to be small (Cohen, 1992) for both H_1 ($r = 0.26$) and H_2 ($r = 0.10$). Research hypothesis H_3 was not supported as the analysis found no statistically significant difference in grade point average (GPA) between transfer students and non-transfer students. In comparing transfer students with non-transfer students in the MUS, the conclusion was that transfer students experienced longer

baccalaureate time-to-degree (H_1) and greater baccalaureate credit accumulation (H_2), while no difference was found in academic performance as measured by GPA (H_3).

In examining the impact of completing the AA/AS associate degree on transfer students, the results of the study did not support research hypothesis (H_4) for sub-question 3 as no statistically significant difference in baccalaureate time-to-degree was observed, but research hypothesis (H_5) for sub-question 4 was supported as a statistically significant difference in baccalaureate credit accumulation was found in these transfer students. Statistically significant differences were found in baccalaureate time-to-degree (H_6) and baccalaureate credit accumulation (H_7) among students completing the AAS degree. The conclusions drawn from the results of the study found transfer students completing either the AA/AS transfer associate degree or the AAS non-transfer associate degree experienced greater baccalaureate credit accumulation, but only those transfer students completing the AAS degree experienced longer baccalaureate time-to-degree.

Research hypotheses for sub-questions 7 (H_8) and sub-question 8 (H_9) stated that a statistically significant difference exists in baccalaureate time-to-degree and baccalaureate credit accumulation between transfer students from independent colleges and transfer students from embedded colleges. Hypotheses H_8 and H_9 were not supported from the findings of the study as a statistically significant difference was not observed in baccalaureate time-to-degree or baccalaureate credit accumulation among transfer students from MUS independent or embedded colleges.

Research hypotheses for sub-question 9 (H_{10}) and sub-question 10 (H_{11}) investigated differences among transfer and non-transfer students of nontraditional age. Research hypothesis H_{10} was supported as a statistically significant difference was found in baccalaureate time-to-

degree for non-transfer students of nontraditional age and transfer students of nontraditional age. Research hypothesis 11 was not supported as a statistically significant difference in baccalaureate credit accumulation was not found between these two groups. It was concluded from the findings of the study that among MUS nontraditional students, baccalaureate degree time-to-completion was longer for transfer students, but no difference was observed in credit accumulation.

The conclusions of this study in the Montana University System during academic years 2014-2016 found that transfer students had longer baccalaureate time-to-degree (H_1) and increased baccalaureate credit accumulation (H_2), but did not experience differences in academic performance (H_3). Completion of the AA/AS transfer degree did not increase baccalaureate time-to-degree (H_4), but did increase baccalaureate credit accumulation (H_5). Completion of the AAS non-transfer degree increased both baccalaureate time-to-degree (H_6) and baccalaureate credit accumulation (H_7). No differences in baccalaureate time-to-degree (H_8) or baccalaureate credit accumulation (H_9) were found among transfer students attending embedded or independent two-year colleges. A difference in baccalaureate time-to-degree (H_{10}) was found between transfer and non-transfer students of nontraditional age, while no difference in baccalaureate credit accumulation (H_{11}) was found in comparing these two student groups of nontraditional age.

Strengths and Challenges

Several strengths of the methodology and findings of the study were identified. One strength was the validity of the data source. In working with OCHE, the researcher had access to the MUS Data Warehouse which serves as the data archive of student data across all MUS institutions. It is the most comprehensive source of higher education enrollment and graduation information available in the State of Montana.

The methodology examined three years of graduate data (2014 – 2016) and 16 years (2001 – 2016) of enrollment data. Reliability is increased with larger samples and observations (Salkind, 2009). Selecting participants for the study from multiple years of graduation data and examining enrollment data across a 16 year span was a strength of the methodology. The reliability of the findings from the study was enhanced due to its design and use of longitudinal data.

Another strength was the design of study in its delimitation of participants to transfer students and non-transfer students from MUS two-year and four-year colleges. In purposely selecting these participants, examination of transfer within a single statewide system was possible. The results from the study can be applied to other states looking to gain a better understanding of how policy can impact student transfer within the confines of a single statewide system of public higher education.

The technique used in calculating time-to-degree was the difference between the term in which graduation occurred and the first term recorded for enrollment. This measurement does not account for possible variations in student attendance patterns. Enrollment intensity (Crosta, 2014), enrollment continuity (Crosta, 2014), and enrollment stop-outs (Monaghan & Attewell, 2015) were not considered in the time-to-degree measurement. One of the challenges for future research would be to develop a baccalaureate time-to-degree measurement which recognizes the varied patterns of student attendance.

Several challenges to the findings of the study were identified. Dougherty and Townsend (2006) describe public statements, programmatic offerings, and effects as the theoretical framework in determining the community college mission. College!Now (MUS, n.d.) created the public statement for determining the transfer education mission, but it did not provide the

programmatic offerings required for transfer education. Individual campuses were responsible for providing the programming. The College!Now initiative was launched in 2012. The timing of the study in the context of recent public statement announcing the transfer mission and the call to provide the programmatic offerings posed a challenge in assessing the effects of the transfer mission. A challenge for future research would be to replicate the methodology of this study as new programmatic offerings are identified and implemented at MUS two-year colleges. Comparing the findings from these resulting studies will provide new insights for leadership.

The ECS (2001) identified a series of recommendations meant to ease student transfer between institutions within a state system of higher education. College!Now (2012) along with the centralized student data repository (2016), common course numbering (2007), and the MUS transferable general education core (2007) are all examples of recent policy implementations aimed at enabling student transfer within the public system of higher education in the State of Montana. Although the findings provide an early assessment of the effects of transfer education, by measuring baccalaureate time-to-degree, further time should be considered to allow missions to be fully implemented, programmatic offerings to be expanded, and policies to produce anticipated results, prior to drawing conclusions. These findings provide an early indicator in measuring baccalaureate time-to-degree for transfer students. The timing in context to other recent policy implementations provides a challenge for further research in which the methodology of this study can be replicated by examining new participants as future students complete the baccalaureate.

Significance of the Findings

This findings and methodology of the study adds an important contribution to the research literature by providing a quantitative analysis of baccalaureate time-to-degree within a single

statewide system of public higher education. Smith (2014) conducted a similar study in which baccalaureate time-to-degree was found to be longer for transfer students in the State of Virginia. Other studies which examine policy and baccalaureate time-to-degree for transfer students within a single statewide system are limited in the current literature.

The findings of this study are significant to stakeholders using public higher education in the State of Montana. Its findings provide practical implications for students and parents looking to choose the path which best serves the individual for completing the baccalaureate. The findings serve to facilitate further discussion on the role of student transfer in the realm of public higher education among students, parents, politicians, and higher education leadership in Montana and in other states.

Baccalaureate time-to-degree is longer for transfer students in the MUS. The two-year college system in Montana has been identified as a means to provide relief to the rising costs of higher education (MUS, n.d.), but the finding that transfer students in the MUS take longer to graduate contradicts this premise. Transfer has been shown to increase a student's overall debt in obtaining the baccalaureate (Brown, 2012). The finding of the study serve to facilitate further discussion regarding the overall economic value in completing the baccalaureate degree using the lower tuition rates found at two-year colleges.

Baccalaureate credit accumulation is greater for transfer students in the MUS. Academic credit has been described as the currency of higher education with credit loss seen as a deterrent to persistence and completion (Junor & Usher, 2008). The finding that greater baccalaureate credit accumulation occurs among transfer students serves to facilitate further discussion on credit transfer processes between institutions and student advising models to prevent the "community college penalty" (Bahr, 2013; Long & Kurlaender, 2009; Mullin, 2012).

Nationally, 45% of all college-bound students begin their education at two-year colleges (AASC, 2016), while in Montana only 27% begin at two-year colleges (MUS, n.d.). The citizens of Montana are not fully utilizing the two-year college system of higher education. The finding that only 13% of baccalaureate graduates during the 2014-2016 academic terms began their studies at MUS two-year colleges should be noted. The premise that two year colleges are underutilized by citizens in Montana has been reinforced by the findings and substantiates a culture where students find two-year higher education less desirable. The findings of the study serve to facilitate further discussion on the role of two-year colleges within the MUS and the public's perception of the two-year college system.

Two-year colleges provide an alternative route for citizens to complete the baccalaureate. Its open enrollment policies and developmental education programs provide an important access point to higher education. The two-year college culture provides smaller class size with faculty focused on teaching and learning (Cohen & Brawer, 2003), an environment which nourishes diverse student groups such as nontraditional students (Bean & Metzner, 1985), first generation college students (Inman & Mayes, 1999), and students from lower SES groups (Bailey et al., 2005). The finding of the study that 54% of baccalaureate degree transfer students were of nontraditional age, while 21% of baccalaureate non-transfer students were of nontraditional age is significant as the study reinforces the unique role of the two-year college in supporting students of nontraditional age and responsibilities

Recommendations

Completion of the baccalaureate is commonly considered to take place within a four year window, yet it was observed from the findings that time-to-degree for the majority of students in the MUS was longer than four years. Time-to-degree is an important metric for everyone

associated with public higher education. This study has shown that there is a methodology capable of calculating time-to-degree for non-transfer and transfer students using the MUS data. It is recommended that this study continue to be repeated and published on a regular cycle. A collection of longitudinal data of time-to-degree will assist leadership in the assessing current practices and crafting new policy and initiatives aimed at improving student time-to-degree for public higher education in the State of Montana.

The Montana two-year college system has a productive history in serving local communities through career-technical education (CTE) programs. The roots of these institutions in providing access to CTE, created a long-standing symbiotic relationship where citizens had access to the education needed to gain regional employment and businesses had access to a well-trained workforce. College!Now marked a considerable shift in direction for the MUS two-year colleges in bringing the comprehensive community college mission to these institutions. It expanded the mission to include the transfer education function. Although the goal of mission expansion was well-intended as its aim was to encourage better utilization of Montana's two-year college system, the initiative did not provide additional resources to fund expansion. One intent of College!Now was to prepare students for jobs, but the addition of the transfer education has likely shifted focus and resources away from the two-year college workforce development function. As a result, MUS two-year colleges may struggle to meet the workforce development needs of businesses in their local communities.

Longer baccalaureate time-to-degree and greater baccalaureate credit accumulation invalidate the assumption that lower tuition rates available at two-year colleges provide citizens financial relief in completing the baccalaureate. The economics of using the two-year college transfer function in completing the baccalaureate require further investigation. It is recommended

that a comprehensive analysis of the total cost in obtaining the baccalaureate through the MUS two-year college transfer system occur prior to propagating the assumption that lower tuition rates lead to financial relief.

Transfer education at independent two-year colleges provides an irreplaceable service to their communities in being the single point of entry for the baccalaureate through public higher education. These institutions are needed in Montana based upon its rural characteristics, sprawling geography, and sparse population. The assumption that it will take longer and cost more to complete the baccalaureate at an independent two-year college can be justified based upon the physical distance between these institutions and a four-year college campus. At embedded colleges, supporting transfer education becomes more difficult to substantiate since the baccalaureate can be completed at the four-year college in a shorter period of time and with less expense. Additionally, the argument persists that transfer education delivered on embedded two-year campuses duplicate the academic programming efforts of the four-year unit.

What should be clearly delineated in this line of discussion is that the community college culture is the preferable baccalaureate option for a different segment of the population, such as first-generation college students and individuals with nontraditional responsibilities. It is relevant discourse if the ultimate goal is to have more Montanans achieve the baccalaureate. Montana does not utilize two-year education as readily as other states. If Montana is truly supportive of transfer education at MUS two-year colleges, further reorganization should be considered, but as autonomous community colleges with local control and the ability to levy local funding. Implementation of the comprehensive community college mission without the autonomy of community college governance and resources of community college funding models will continue to be a challenge in implementing the transfer education function in the MUS.

These findings of this study have attempted “to draw out the overt and covert intentions and intended and unintended (but systemic) outcomes” (Dougherty & Townsend, 2006, p. 7) of the two-year college transfer mission through examination of baccalaureate time-to-degree for transfer students. The unintended outcome has invalidated the assumption that the MUS two-year colleges provide a cost-effective route to the baccalaureate. It is an important conclusion that should prompt State leadership to better identify its logic in implementing the transfer education function of the College!Now initiative.

The responsibility is now left to leadership on individual campuses to recognize this complex dilemma. The challenge will be how to expand the programmatic offerings needed for transfer education while retaining the workforce development function without incremental funding to support expansion. McPhail and McPhail (2006) described “the difficult and critical challenge for community colleges in the twenty-first century will be to determine which of their current and historic missions are viable in today’s social, political, and economic milieu” (p. 92). Complexity might best describe the multiple functions of the two-year college mission, with transfer education the most misunderstood (Alfonso, 2006). If two-year colleges are to continue to deliver their diverse mission functions, limited resources will force the traditional barriers segregating transfer education and CTE to unify agendas (Palmer, 1987), if these colleges are going to serve their multiple stakeholders. Cooperation between CTE personnel and transfer education personnel, and between two-year college units and four-year college units will be crucial. The ultimate responsibility for recognizing problems and bringing together the appropriate groups of stakeholders to identify solutions will be that of two-year college campus leadership.

Disclosure

At the time of this study, the researcher was employed as a faculty member at Missoula College. Missoula College is an embedded two-year college at the University of Montana in Missoula and a member institution of the Montana University System.

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Appendix A: Request for Data

Baccalaureate degree time-to-degree could take longer for students using Montana's two-year college system. This study will examine time-to-completion for transfer students across the Montana University System (MUS). Comparing baccalaureate degree time-to-completion of transfer students with non-transfer students could provide valuable insights for citizens and leadership across the State of Montana.

The MUS statewide data repository system has been in place since 2001. According to the MUS website for Data and Reporting, "the Office of the Commissioner of Higher Education (OCHE) is responsible for providing a variety of data and reports to a wide range of internal and external constituents" (Montana University System, n.d.). The MUS data warehouse serves as the primary repository of institutional data in Montana for MUS members. Well-established data sharing processes have been in place between OCHE and the two- and four-year colleges affiliated with the University of Montana and Montana State University.

Longitudinal student data sets will be required in conducting a time-to-completion study. Analyzing data sets from graduates conferred over multiple years will enhance reliability and validity in the methodology of the study. The warehouse has a sufficient archive of longitudinal student data from the University of Montana and Montana State University campuses for conducting a comprehensive, multi-year time-to-completion study.

Participation in data sharing between OCHE and other two-year colleges across the State has been limited. The three community colleges recently adopted data management systems (Banner) capable of data sharing with the MUS warehouse. While Miles Community College and Dawson Community College joined the data warehouse in Autumn Term 2010, Flathead Valley Community College began sharing its data with the OCHE during Spring Term 2016. The

MUS data warehouse currently does not have sufficient longitudinal data in the repository for a comprehensive, multi-year time-to-completion study involving the three community colleges.

Montana two-year Tribal Colleges do not participate in data sharing activities associated with the MUS data warehouse. These institutions are not members of the MUS. They are organized and governed through local Tribal Agencies. The MUS warehouse does not have data in the repository to facilitate a time-to-completion study involving Montana Tribal Colleges.

The MUS data warehouse has a sufficient archive of reliable data to conduct a longitudinal study of the six MUS two-year colleges affiliated with the University of Montana and Montana State University. The following two-year colleges will be included in the baccalaureate time-to-degree study: City College, Great Falls College, Helena College, Highlands College, and Missoula College. The study's baccalaureate degree granting institutions will include a census of all MUS four-year degree granting institutions. The following four-year colleges will be included: Montana State University-Billings, Montana State University-Bozeman, Montana State University-Northern, Montana Tech, University of Montana-Missoula, and University of Montana-Western,

Participants for this study will include a census of students conferred with the baccalaureate degree for three consecutive academic years: 2014, 2015, and 2016. The study will examine graduates conferred during the time period beginning Summer Term 2013 and ending Spring Term 2016. Participants of this study will be identified using an anonymized student primary key, assigned by the MUS data warehouse administrator designated by OCHE. The researcher requests two database view for obtaining graduate and enrollment data. An anonymized student identification number is requested to join the two views.

Appendix B: MUS-OCHE Letter of Support**MONTANA UNIVERSITY SYSTEM**
OFFICE OF THE COMMISSIONER OF HIGHER EDUCATION

2500 Broadway – PO Box 203201 – Helena, Montana 59620-3201
(406) 444-6570 – FAX (406) 444-1469

October 14, 2016

To Whom It May Concern:

Please accept this letter as an indication of support for Tom Gallagher's dissertation proposal and the data requirements related to the research.

The Office of the Commissioner of Higher Education has reviewed and discussed the proposal with Mr. Gallagher and we recognize the value and importance of this research. Baccalaureate degree time-to-completion is an important student success metric and a topic of interest for OCHE and the Board of Regents. The ability for students who enter our Two-year Colleges to successfully transfer to a Four-year College and earn a Bachelor's Degree is a critical path to educational success that the Montana University System must ensure is in place and functioning well.

The Department of Planning & Analysis at OCHE is committed to assisting Mr. Gallagher with extracting data from the MUS Data Warehouse and assembling the database needed to complete his research.

Sincerely,

A handwritten signature in cursive script that reads "Tyler Trevor".

Tyler Trevor
Deputy Commissioner of Planning & Analysis

Appendix C: IRB Data Use Agreement

THE UNIVERSITY OF MONTANA

DATA USE AGREEMENT FOR LIMITED DATA SETS FROM EDUCATION RECORDS

This Data Use Agreement for Limited Data Sets (the "Agreement") is made this 24 day of MARCH, 2017 by and between MONTANA UNIVERSITY SYSTEM (MUS) - OFFICE OF THE COMMISSIONER OF HIGHER EDUCATION (OCHE) ("Provider") and UNIVERSITY OF MONTANA (UM) - EDUCATIONAL LEADERSHIP DEPARTMENT (EDLD); DOCTORAL CANDIDATE THOMAS GALLAGHER ("Recipient").

WHEREAS, 34 CFR Part 99 (titled "Family Educational Rights and Privacy Act (FERPA)" and herein referred to as "FERPA") allows Provider to make available for the purposes of independent research a limited data set to Recipient, provided that Recipient agrees to be bound by the terms of this Agreement; and

WHEREAS, Recipient desires for Provider to make available the limited data set as described below and agrees to be bound by the terms and conditions of this Agreement; and

WHEREAS, Provider agrees to make available such limited data set, provided that Recipient agrees to abide by the terms and conditions of this Agreement as well as applicable IRB requirements.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter set forth, the parties hereto agree as follows:

A. DEFINITIONS

For the purposes of this Agreement, terms used herein shall have the same definition as set forth in the FERPA law at 34 CFR Part 99; and

Independent Research refers to any research not commissioned by the university solely for university purposes.

B. DATA TO BE PROVIDED BY PROVIDER

The limited data set provided pursuant to this Agreement contains data acquired from the MUS DATA WAREHOUSE and related to ANONYMIZED STUDENT DATA INCLUDING MUS ATTENDANCE HISTORY, CREDIT ACCUMULATION, GPA, AGE, and DEGREES COMPLETED.

The University of Montana IRB	
Expiration Date	<u>None</u>
Date Approved	<u>3-27-2017</u>
Chair/Admin	<u>Paula A. Buhl</u>

THE UNIVERSITY OF MONTANA

Such data shall be limited to data that is the Minimum Necessary to reasonably accomplish the Authorized Purposes identified in Section (C)(1) of this Agreement.

For the purpose of this Agreement, "Minimum Necessary" is defined as that which is "reasonably necessary to achieve the purpose of the disclosure" and is disclosed to only "Those persons, as appropriate, who need access to the education records to carry out their research."

Education records may be released without consent under FERPA provided an authorized school official (other than the investigator) with appropriate access strips the records of all personally identifiable information including:

- a. Student's name and other direct personal identifiers, such as the student's social security number or student number.
- b. Indirect identifiers, such as the name of the student's parent or other family members; the student's or family's address, and personal characteristics or other information that would make the student's identity easily traceable; date and place of birth and mother's maiden name.
- c. Biometric records, including one or more measurable biological or behavioral characteristics that can be used for automated recognition of an individual, including fingerprints, retina and iris patterns, voiceprints, DNA sequence, facial characteristics, and handwriting.
- d. Other information that, alone or in combination, is linked or linkable to a specific student that would allow a reasonable person in the school community, who does not have personal knowledge of the relevant circumstances, to identify the student with reasonable certainty.

C. PERMITTED USES AND DISCLOSURES

1. Recipient agrees to limit the use and disclosure of the limited data set to the following purposes ("Authorized Purposes"): COMPARISON STUDY OF BACCALAUREATE TIME-TO-DEGREE FOR TWO-YEAR COLLEGE TRANSFER STUDENTS AND TRADITIONAL FOUR-YEAR COLLEGE STUDENTS (IRB REQUEST #83-17).
2. The Recipient shall allow only the following individuals access to the limited data set for the Authorized Purposes and consistent with the assurances and obligations set forth in this Agreement: THOMAS GALLAGHER (PI) and DR. FRANCES O'REILLY (DISSERTATION CHAIRPERSON)
3. Recipient acknowledges that such individuals have a need to access the limited data set to carry out their duties.

The University of Montana IRB	
Expiration Date:	None
Date Approved:	3-24-2017
Chair/Admin:	<i>Frank M. Baker</i>

THE UNIVERSITY OF MONTANA

D. ASSURANCES

1. Recipient shall not use or further disclose the limited data set other than as permitted by this Agreement or as otherwise required by law.
2. Recipient shall use appropriate safeguards to prevent use or disclosure of the limited data set other than as permitted by this Agreement.
3. Recipient shall report to the Provider Privacy Officer any use or disclosure of the limited data set not provided for by this Agreement of which Recipient becomes aware.
4. Recipient shall ensure that any specified agents (see C.2., above), including a subcontractor, to whom it provides the limited data set agrees to the same restrictions and conditions that apply to the limited data set Recipient with respect to such information.
5. Recipient shall not re-identify the information or contact the individuals for whose records are contained within the limited data set.

E. BREACH AND TERMINATION

1. In the event that this Agreement is breached by Recipient, Provider, at its sole discretion, may a) terminate this Agreement upon written notice to Recipient or b) request that Recipient, to the satisfaction of Provider, take appropriate steps to cure such breach. If Recipient fails to cure such breach to the satisfaction of Provider or in the time prescribed by Provider, Provider may terminate this Agreement upon written notice to Recipient.
2. Should this Agreement be terminated for any reason, including, but not limited to Recipient's decision to cease use of the limited data set data, Recipient agrees to destroy or return all limited data set data provided pursuant to this Agreement (including copies or derivative versions thereof).

F. MISCELLANEOUS

1. Notices Any notice permitted or required as provided for herein shall be in writing and to the contact and address as noted below or as may be provided by either party to the other in writing from time to time.

The University of Montana IRB	
Expiration Date	<i>None</i>
Date Approved	<i>3-24-2017</i>
Chair/Admn	<i>[Signature]</i>

THE UNIVERSITY OF MONTANA

Notice to Provider shall be to:
MONTANA UNIVERSITY SYSTEM, OCHE
TYLER TREVOR
PO BOX 203201
2500 BROADWAY
HELENA, MT 59620-3201
406.444.6570
TTREVOR@MONTANA.EDU

Notice to Recipient shall be to:
THOMAS GALLAGHER
MISSOULA COLLEGE
909 SOUTH AVENUE WEST
MISSOULA, MT 59801
406.243.7814
THOMAS.GALLAGHER@UMONTANA.EDU

2. Governing Law

This Agreement shall be governed by, and construed in accordance with, the laws of the State of Montana.

MUS, OCHE ("Provider")

("Recipient")

Name (print): TYLER TREVOR

Name (print): THOMAS GALLAGHER

Title: DEPUTY COMMISSIONER

Title: DOCTORAL CANDIDATE, EDLD

Signature: *Tyler Trevor*

Signature: *T. Gallagher*

Date: 3/24/17

Date: 3/24/17

The University of Montana IRB	
Expiration Date	<u>None</u>
Date Approved	<u>3-24-2017</u>
Chair/Admn	<u><i>Paul N. Bell</i></u>

Appendix D: Data Reduction Process for Participant Selection

Data for the study were provided by Montana University System (MUS) IT Director, John Thunstrom at the request of Deputy Commissioner for Planning and Analysis, Tyler Trevor. The researcher was provided access to the MUS Data Warehouse and given two structured query language (SQL) views to access data. All records provided in the SQL views were anonymized with a randomly assigned identifier for each participant prior to the researcher gaining access to the data sets. The researcher did not have access to any information connecting the identity of participants with the records contained in the data.

The views were entitled: GRADUATES and ENROLLMENTS. GRADUATES (n = 20,792) contained records for student graduating from all MUS institutions during the time period July 2013 through May 2016. ENROLLMENTS (n = 191,009) contained student enrollment records at all MUS institutions during the time period June 2001 through May 2016. The field ID_NUMBER is the primary key for both data sets and served as the connecting field for all SQL join operations. The specific database schema for GRADUATES and ENROLLMENTS is listed in Figure D1.

```

GRADUATES <ID_NUMBER, CAMPUS, TERM, GENDER, MT_RACE, AGE, RESD_STATUS,
HOURS_EARNED, GPA, AWARD_CAT_DESC, DEGREE, PREV_COLLEGE_CODE,
PREV_COLLEGE_DESC, PREV_COLLEGE_STATE, PREV_DEGREE_TERM>

ENROLLMENTS <ID_NUMBER, CAMPUS, TERM, AGE, HS_GRAD_DATE,
HIGH_SCHOOL_DESC, HIGH_SCHOOL_STATE, HS_GPA, PREV_COLLEGE_DESC,
PREV_COLLEGE_STATE, FT_PT, RESD_STATUS, DEGREE1_DESC, TERM_CREDITS,
TERM_GPA>

```

Figure D1. MUS Data Warehouse Database Schema. This figure illustrates the customized data view provided to the researcher from the MUS Data Warehouse.

The GRADUATES and ENROLLMENTS views were extracted from the MUS Data Warehouse and imported as tables in a local relational databases using *MS Access* software for further processing. Query 1 was used to select participants for the non-transfer student group from the GRADUATES table (n = 20,825). A two-fold criteria was used for selection of these individuals: baccalaureate and did not attend an out of state institution as listed in the fields: PREV_COLLEGE_CODE, PREV_COLLEGE_DESC, or PREV_COLLEGE_STATE. Individuals with two or more distinct records (DISTINCTROW) were double majors and were only counted once. Query 1 is shown in Figure D2.

```
SELECT DISTINCTROW GRADUATES.id_number, GRADUATES.campus,
GRADUATES.term, GRADUATES.age, GRADUATES.hours_earned, GRADUATES.gpa,
GRADUATES.award_cat_desc, GRADUATES.prev_degree_term,
GRADUATES.prev_college_code INTO [1-Distinct]

FROM GRADUATES

WHERE (((GRADUATES.award_cat_desc) = 'BACCALAUREATE DEGREE') AND
((GRADUATES.prev_college_code) Is Null) AND
((GRADUATES.PREV_COLLEGE_DESC) Is Null) AND
((GRADUATES.PREV_COLLEGE_STATE) Is Null))

ORDER BY GRADUATES.prev_degree_term;
```

Figure D2. Query 1. SQL query used to eliminate participants and create initial non-transfer student group.

The first date (STARTDATE) and campus (STARTCAMPUS) of enrollment from the ENROLLMENTS table was joined with Query1 in creating a new table entitled GRAD_ENROLLMENTS. This table was further refined to eliminate records where STARTCAMPUS and FINISHCAMPUS were not the same. This process was used to eliminate records in which a possible data entry error in coding of the previous college could have occurred. A duplicates records query was used to identify students earning a second baccalaureate. These records were manually removed from the database. The remaining records

were identified as participants in the non-transfer group. These records were extracted from the database and imported into *MS Excel* software for quantitative analysis. This group was identified in the study as participants of Group 1 Non-transfer students.

Transfer student participants were selected to populate Group 2. The `PREV_COLLEGE_CODE` field in `GRADUATES` was used to populate baccalaureate students that had previously attended Great Falls College, Helena College, Highlands College and Missoula College, but no baccalaureate students from City College were found using this field. City College participants were located by using another query. A `STARTCAMPUS` was derived from the `ENROLLMENTS` table and joined with baccalaureate `GRADUATES` table to identify students beginning at City College and completing the baccalaureate. Using the primary key of each record in the `GRADUATES` table, a `PREV_COLLEGE_CODE` was added for baccalaureate graduates from City College. Figure D3 identifies the initial query to Query 2. Double majors and previous degree recipients were removed as described for Group 1. Query 2 is shown in Figure D3. These records were extracted from the database and imported into *MS Excel* and *SPSS* software for quantitative analysis. This group was identified in the study as participants of Group 2 transfer students. Group 1 (n = 6517) and Group 2 (n = 746) were the two independent groups of participants used in compiling the descriptive and inferential statistics in answering the primary research question and research sub-questions 1, 2, 9, and 10.

```

SELECT DISTINCTROW GRADUATES.id_number, GRADUATES.campus,
  GRADUATES.term, GRADUATES.age, GRADUATES.hours_earned,
  GRADUATES.gpa, GRADUATES.award_cat_desc, GRADUATES.prev_degree_term,
  GRADUATES.prev_college_code INTO [1-Transfers]

FROM GRADUATES

WHERE (((GRADUATES.award_cat_desc) = 'BACCALAUREATE DEGREE')
  AND
  /* Msla College */ ((GRADUATES.prev_college_code) = 'C008'
  OR /* Helena College */ (GRADUATES.prev_college_code) = 'C007'
  OR /* Highlands College */ (GRADUATES.prev_college_code) = 'C002'
  OR /* Great Falls College */ (GRADUATES.prev_college_code) = '2432'
  OR /* City College */ (GRADUATES.prev_college_code) = 'CITY'));

```

Figure D3. Query 2. SQL query used to identify transfer students.

Group 2 was used in creating groups 3, 4, 5, 6, 7, and 8 for answering research sub-questions 3, 4, 5, 6, 7, and 8. Group 4 consisted of participants that had completed the AA/AS degree prior to the baccalaureate. Query 3 was used to select these participants from using the Group 2 and the ENROLLMENTS table as defined in Figure D4. Following creation of Group 4, an unmatched records query between Group 4 and Group 2 was used to derive participants for Group 3 transfer students without the AA/AS degree. Group 3 (n = 664) and Group 4 (n = 82) were extracted from the database and imported into *MS Excel* and *SPSS* software for quantitative analysis.

```

SELECT All_Transfer.*, Enrollments.DEGREE1_DESC AS Prev_Degree,
  All_Transfer.prev_degree_term AS Prev_Degree_Year INTO AA_Transfer

FROM All_Transfer, Enrollments

WHERE (((Enrollments.DEGREE1_DESC) = "Associate of Arts"
  OR (Enrollments.DEGREE1_DESC) = "Associate of Science")
  AND
  ((All_Transfer.prev_degree_term) Is Not Null
  AND (All_Transfer.prev_degree_term) = [Enrollments].[TERM])
  AND ((All_Transfer.id_number) = [Enrollments].[ID_NUMBER]));

```

Figure D4. Query 3. SQL query used to identify transfer students that had completed the AA or AS degree.

Group 6 participants were selected from the pool of participants in Group 2 that had earned the AAS degree prior to the baccalaureate using Query 4 as illustrated in Figure D5. Following creation of Group 6, an unmatched records query between Group 6 and Group 2 was used to derive participants fulfilling the criteria of transfer students without the AAS degree in selecting Group 5. Group 5 (n=678) and Group 6 (n = 68) were extracted from the database and imported into *MS Excel* and *SPSS* software for quantitative analysis.

```
SELECT All_Transfer.*, Enrollments.DEGREE1_DESC AS Prev_Degree,
       All_Transfer.prev_degree_term AS Prev_Degree_Year INTO AA_Transfer
FROM All_Transfer, Enrollments
WHERE ((Enrollments.DEGREE1_DESC) = "Associate of Applied Science"
AND
       ((All_Transfer.prev_degree_term) Is Not Null
AND (All_Transfer.prev_degree_term) = [Enrollments].[TERM])
AND ((All_Transfer.id_number) = [Enrollments].[ID_NUMBER]));
```

Figure D5. Query 4. SQL query used to identify transfer students that had completed the AAS degree.

Group 7 consisted of participants selected from Group 2 who had attended an embedded college, while Group 8 consisted of participants selected from Group 2 who had attended an independent college. Group 7 (n = 250) and Group 8 (n = 370) were extracted from the database and imported into *MS Excel* and *SPSS* software for quantitative analysis in answering research sub-questions 7 and 8.

Group 10 consisted of participants selected from Group 1 whose age at time of graduation was greater than 24. Group 9 consisted of participants selected from Group 2 whose age at time of graduation was greater than 24. Groups 9 (n = 1352) and Group 10 (n = 401) were extracted

from the database and imported into *MS Excel* and *SPSS* software for quantitative analysis in answering research sub-questions 9 and 10.

Time-to-degree was measured using semesters. It was determined by finding the difference between GraduationDate and StartDate. Figure D5 illustrates the calculated query that rounded Summer Session StartDate to Autumn Semester and Summer GraduateDate to Autumn Session in finding Time-to-Degree.

```
= ROUND((GRADUATIONDATE - STARTDATE + 20) / 100,0)  
+ IF((STARTDATE_SEMESTER = GRADUATIONDATE_SEMESTER),1,0)
```

Figure D6. Time-to-Degree Calculated Query Formula.

Credit accumulation recorded in the GRADUATION table was not always consistent with the sum of credits accumulated in the ENROLLMENTS table. The greater of the two values was used to calculate the credit accumulation value used in the study.