

**English as a Second Language courses: A path to college?  
A study of noncredit ESL students and their patterns of matriculation  
to community college**

by

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**Dedication**

In honor of all my parents, who are my roots, providing my foundation.

To Galen and Kathy, who always knew I could branch out.

To Jesse, my evergreen.

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**ABSTRACT**

This study analyzed existing student record data on the 2005 to 2014 student enrollment in noncredit English as a Second Language courses at Des Moines Area Community College, Urban Campus to identify demographic factors and course-taking patterns that predicted matriculation or nonmatriculation to community college courses. This study concentrated on three theories to support the research: the first of these was Bean's (1981) student attrition model, the second was Becker's (1964) theory of human capital, and third was Hagedorn Maxwell, Chen, Cypers, and Moon's (2007) theory of Latino community college students as a critical mass. Statistical analyses were performed on students' demographic information, including age group, race, ethnicity, residency status, beginning course level, ending course level, and total number of courses taken. Cross-tabulations, Pearson chi-square tests, *t* tests, and logistic regression were used to determine the factors that predict matriculation or nonmatriculation to community college.

## CHAPTER 1. INTRODUCTION

Miguel, Mu, and Batika are great students. They consistently attend their English as a Second Language (ESL) courses and work well individually and in their small groups. Although their long-term goals may vary, their short-term goals are identical: These three students want to improve their English language skills.

Miguel came to the United States from Guatemala in 1999. He is married, has three children, and works 40 hours a week at a local manufacturing company. Recently, he has changed his work schedule to the night shift in order to be able to take morning noncredit English language courses at Des Moines Area Community College (DMACC) Urban Campus. He did not finish his secondary education in Guatemala and plans to work through the noncredit ESL courses and then complete his high school equivalency diploma in order to start college courses. His long-term goal is to get a degree in Architecture at Iowa State University. Ultimately, he wants to provide a financially stable environment for his three children and his wife, who also works fulltime as a certified nursing assistant at a local hospital. She received this training through a grant at DMACC. Miguel knows he has a long road ahead of him; his last level of noncredit ESL courses, then going through the High School Equivalency Diploma (HiSED) program and through a part time Liberal Arts transfer program at DMACC will most likely take him at least 5 years to complete. He jokes that he wants to graduate with his 4-year degree before his 5-year-old finishes high school.

Mu has been in the United States for almost 7 years following 10 years in a refugee camp in Thailand after fleeing her native Burma during the civil war. Her family received their refugee paperwork and resettled in Des Moines. Mu was lucky to have schooling in the refugee camp in Thailand but said that not everyone was able to attend. Now that her

younger sisters and brothers are in high school in Des Moines, Mu has decided that it is her turn to improve her English. Speaking English with her younger siblings has improved her oral proficiency, but she says her writing and grammar skills are not very good. Her short-term goal is to complete her noncredit ESL courses at DMACC Urban Campus and then get her driver's license. Because it was her job to raise her brothers and sisters while her parents worked in the meat packing plants, Mu has never worked outside of the home but would like to get a job in an office someday.

Batika has just celebrated her 18th birthday and relocated to Des Moines from St. Louis. She and her family came to the United States from the Congo, where she was born. They arrived in St. Louis in the middle of winter 7 years ago. She completed high school there and decided to leave St. Louis to live with a friend in Des Moines after she realized her family didn't support her attending school past high school. Batika knows very few people in Des Moines and started noncredit ESL courses because her friend was attending DMACC Urban Campus. She says she loves school and would like to be a teacher or a professor one day. After her noncredit ESL courses, she wants to enroll in college somewhere and graduate.

These three students represent the various backgrounds and experiences of many new Iowans over the past decades. The growth of the foreign-born population in the United States and Iowa has increased steadily throughout the years, from 2% of Iowa's population in 1990 to 5% in 2010 (Chicago Council on Global Affairs, 2012) and from 8% to 13% in the United States (Migration Policy Institute, 2014). Iowa, with its Iowa Bureau of Refugee Services, is the only state in the nation to have a voluntary resettlement agency that is certified by the U.S. State Department. Located in Des Moines, the bureau was organized in

1975 by Governor Robert D. Ray under the Iowa Department of Human Services (2014) to support efforts to resettle 1,000 refugees from Southeast Asia after the Vietnam War. The bureau originally settled refugees throughout Iowa but currently settles new Iowans in the Des Moines area, contributing to the over 8% foreign-born population in Polk County (U.S. Census Bureau, 2014) as compared to a rate of 5% across the state. Between 1990 and 2005, Iowa's population grew by 6.8%, and two-thirds of this growth was due to immigration into the state (Grey, 2006).

With these changing demographics comes differing levels of communication abilities. According to the Migration Policy Institute (2014), 8.5% of the U.S. population identified themselves as "limited English proficient" or LEP. LEP is defined as any person age 5 or older who self-identifies as speaking English "not at all" or "not well." In Iowa, over 35,400 people identified as LEP in 1990; in 2010 this number was over 86,000—a 143.4% change in 20 years (U.S. Department of Education, 2013). Between 2009 and 2011 in Polk County, where Des Moines is located, the LEP population was just under 6% of the population, amounting to more than 22,000 people with limited English skills and meaning that more than 25% of the LEP population in the state is located in the Des Moines area. With the average age of immigrants being 41 years of age, according to the U.S. Census (2010), over 90% of the immigrant population in the Des Moines area is over the age of 18 and thus not eligible for primary and secondary English language learning services in the public schools.

### **Noncredit English as a Second Language Program at DMACC Urban Campus**

From the Fall 2005 semester to the Spring 2014 semester, DMACC Urban Campus served over 9,500 students in its noncredit ESL program. These students came from a multitude of countries, ethnicities, and backgrounds. During one semester, an informal poll

found that these students spoke 95 different languages and represented 64 different countries. As the largest single noncredit ESL site in the state, DMACC Urban Campus possesses a rich, diverse educational environment and provides its students with opportunities to better themselves through education.

In addition to various language, nationality, and socioeconomic differences, the DMACC Urban Campus students differ widely in educational levels, which is consistent with research on ESL populations (Echevarria, Short, & Vogt, 2004; Gerardi, 1996). Doctors from the Philippines, professors from Russia, and entrepreneurs from Peru take courses alongside agricultural workers from Mexico and stay-at-home moms from Vietnam. Individual goals of this population vary. Some students want to improve their English to assist their children with their homework, whereas others need to add skills to gain a promotion or pass licensure exams, to gain residency, or to pass high school equivalency exams. Some of the factors that affect ESL students' literacy development (Burt, Peyton, & Adams, 2003) include literacy or illiteracy in their native language, educational background, second language proficiency, the learner's individual goals, limited financial resources, students' own tendency to self-eliminate, and structural constraints within the postsecondary system (Burt et al., 2003; Kanno & Varghese, 2010).

Community colleges serve an important role in educating nonnative English speakers. About one in four students at community colleges is an immigrant, and international students commonly seek out the community college for financial reasons (Crandall & Shepard, 2004). DMACC Urban Campus offers a variety of courses to nonnative English speaking students ranging from preliteracy noncredit English courses to developmental college-level ESL to advanced credit-bearing ESL courses that are transferable and count toward a postsecondary

degree. The goals of the individual student, educational background, and test scores determine the best placement for that student at DMACC Urban Campus.

The U.S. Department of Education (2008) stated that over 44% of adult education and literacy funding is spent on English language learners. In 2010, the department reported that, in the United States, 42% of the students in adult literacy programming were in ESL programs (U.S. Department of Education, 2013). In the state of Iowa that year, the percentage was 35%, and the next year, 2011, that percentage was 37% (NCES, 2012), indicating that both nationally and in Iowa the need for these services is growing in step with immigration trends. Even with this funding, shortfalls still exist. In 2003, although 8 million immigrant adults were eligible to apply for citizenship in the United States, many did not due to lack of English proficiency (Fix, Passel, & Sucher, 2003).

With this large and continually growing adult population with English language learning needs, DMACC began a small ESL program in 1978 at the Urban Campus. Since its inception, the program has grown to serve up to 750 students a semester. The program serves adult students with the oldest student currently age 77. The program accommodates a variety of skill levels, and students are placed in these levels according to their testing scores. The noncredit program consists of seven levels ranging from preliteracy and basic beginning courses to levels one through five. These courses are offered free of charge with funding through the State of Iowa's Department of Education. According to a study by Valentine (1990), Iowa students attend these types of courses in order to help people in their native countries, to improve their reading and writing skills in English, to be able to help their children with homework and to speak with their teachers, to function better with everyday activities such as shopping and using the phone, to experience the success of knowing they

can learn the language, and to improve their employability by being better able to enter job training or get a better job.

### **Iowa's Need for Community College Graduates—Work Force Development**

The state of Iowa and other areas in the United States have a large stake in the reading and communication levels of individuals in their societies because English language literate adults are able to participate more fully in their respective communities and contribute to the economic, social, and educational health of their community (Fingeret, 1983). A study by the Washington State Board for Community and Technical Colleges (2005) in collaboration with the Community College Research Center found that students significantly increased their annual earnings when they had at minimum 1 year's worth of community college credits and had earned a credential. These students, who were first-time college students 25 years of age or older with a high school education or less, started at various levels of adult education programming. The researchers looked at their 5-year transcript information of the just under 35,000 students sampled and found that students who began in Adult Basic Education or General Education Development (GED) programs had an earning advantage of \$8,500 and students who began in the ESL programs had an earning advantage of \$7,000. This research indicates that students have a significant earnings advantage if they are able to gain college credits.

Considering the economic impact of furthering one's education in noncredit areas such as high school completion and ESL programs, surprisingly little research has been conducted on this aspect of community colleges. Even the Integrated Post-Secondary Education Data System doesn't include data concerning noncredit enrollment, including ESL programming, in its enormous database of higher education statistics. Ryder and Hagedorn (2012) noted that noncredit programming, nationally and in the state of Iowa, fail to garner

much analytic attention and called for standardization of noncredit data to facilitate serious inquiry.

### **Statement of the Problem**

With the LEP population in Iowa growing dramatically over the last 20 years, the need to increase the earning potential of this group is imperative to the economic health of the state. The native-born population in Iowa is growing older (U.S. Census Bureau, 2010) and having lower rates of birth (Iowa Department of Public Health, 2013) than are nonnative populations. Labor force statistics also support this need; for 2012, 16% of the U.S. labor force was made up of nonnative Americans, which was up from 5% in 1970 (Migration Policy Institute, 2014). With the projections for retirements in the state of Iowa on the rise, particularly in the areas of manufacturing, healthcare and social services, retail and finance, insurance, and real estate industries (Iowa Workforce Development, 2013), the need for new workers is becoming apparent, as one in every four Iowans will be age 65 or older by 2030 (Grey, 2006). English proficiency also has an effect on employment status. The rate of employment for U.S. natives and immigrants who speak English fluently (based on their own subjective measure) ranged between 93% and 95% as compared with 82% who did not speak English fluently (Meisenheimer, 1992). Byoun (2013) found similar results in examining race and ethnicity and English skills; all groups examined, except for Blacks, were found to benefit from English skills in regard to their occupational status. The earnings of those with English language skills increase by as much as 6% to 21% (Chiswick & Miller, 1995, 2002; Lewis, 2011). Studies also have documented that immigrant populations tend to live in poverty at higher rates than do native-born populations. In the year 2000, 45% of the male immigrant population in the United States working full-time, year-round jobs made less the \$25,000 per year (Wrigley, Richer, Martinson, Kubo, & Strawn, 2003). Among recent



immigrants of the same population, the percentage rose to 57%, with recent immigrants being more likely to be part of the LEP population (Wrigley et al., 2003). Postsecondary education increases earning potential (Bureau of Labor Statistics, 2014) and contributes to higher rates of employment, higher home ownership rates, lower rates of incarceration, and decreased dependence on social support programs (Khatiwada, McLaughlin, Sum, & Palma, 2007). Also, educational levels are tied to reductions in crime and recidivism, Medicaid and Medicare costs, and other social costs (Swail, 2003).

### **Purpose of the Study**

Despite the well-documented changes in Iowa's population and the relatively high funding stream supporting the state's literacy programming, little research has examined the college-going rates of LEP students in noncredit programming. The purpose of this study was to examine the demographic factors of the students attending ESL noncredit programming between the years of 2005 and 2014 and compare these demographics to the ESL students who continued their postsecondary education at DMAACC.

Although gaining postsecondary education credentials can dramatically increase one's earnings, many noncredit ESL students do not matriculate. With the demand for an increasingly educated workforce across Iowa and the nation, the growing population of undereducated and low-skilled LEP people may hinder this ideal. Hodara (2014) stated,

Policies and programs that focus on the college success of immigrants could . . . have a profound impact on not only immigrant's individual well-being but also the prosperity of the United States, whose economic growth is tied to a large and growing immigrant population. (p. 2)

Overall, DMAACC Urban serves roughly half of the noncredit ESL population in the entire DMAACC district. With the noncredit ESL program originating at the Urban Campus in the

1978 and it being the largest single site for these courses in the state, this study focused solely on Urban Campus students. The present study concentrated on the demographics and predictive models of noncredit ESL students' matriculation and nonmatriculation and also exposed areas of college programming to increase the number the noncredit ESL students' rates of matriculation.

### **Research Questions**

This study examined three areas of concentration for the noncredit ESL student population at DMACC Urban Campus. The first area concerned the demographics of the population. The study examined records of students' gender, ethnicity, race, residency status, and age. These demographics were examined along with the number of noncredit courses taken and the first and last level of noncredit courses taken. The second area of concentration examined the statistical differences between the students who had enrolled in college courses versus the students who had not enrolled in college courses. The third area of this research examined what could be predicted from this data. Thus, the research questions that guided this study were as follows:

1. What are the demographics (gender, ethnicity, race, residency status, age group, total number of courses taken, level of first course taken, and level of last course taken) of the noncredit ESL student population at DMACC Urban Campus and what were their characteristics prior to beginning their noncredit ESL course work?
2. Are there any statistically significant differences between noncredit ESL students who matriculated and those who did not matriculate to college in terms of gender, ethnicity, race, residency status, age group, and course-taking patterns?

3. To what extent do noncredit ESL students' demographics (gender, ethnicity, race, residency status, and age group) and learning experiences (total number of course levels taken, first and last levels of courses taken) predict their matriculation to college-level courses?

### **Theoretical Framework**

This study concentrated on three theories to support the research. The first of these was Bean's (1980) student attrition model, the second was Becker's (1964) theory of human capital, and third was Hagedorn, Chi, Cepeda, and McLain's (2007) theory of Latino community college students as a critical mass.

#### **Student Attrition Model**

Numerous factors can contribute to a student's path to or away from college, but Bean's (1981) model of student attrition shows that students' background characteristics, in addition to organizational variables, environmental variables, and attitudinal and outcome variables, contribute to a student's staying in or leaving college. Bean's (1981) model incorporates these variables (Swail, 2003) and has been used to untangle the complex reasons students leave college. This research focused on the background of noncredit ESL students and capitalized on the work of Bean (1981) in assessing the background factors that may or may not predict students' matriculation into college-level courses.

#### **Human Capital Theory**

Becker (1964) defined human capital as akin to physical or financial assets and used the example of investing in education as an asset. When students invest in education or training, they invest in themselves. This investment in turn raises the financial value of a person in terms of personal earning potential. Becker concentrated his work on education

and economics, but the theory of human capital has direct implications for ESL students because they are looking to improve their skills and increase their capital.

### **Critical Mass Theory**

This study used Hagedorn et al.'s (2007) work with the TRUCCS (Transfer and Retention of Urban Community College Students) questionnaire and subsequent dataset in California as a third theory to support the conceptual framework. Hagedorn et al.'s study of Latinos as a critical mass as a factor in the success of community college students applied the idea that a particular level of representation of a minority group within an organization, in this instance a community college system, increases the success rates of minority students. In examining these success rates and the demographics of the students and faculty, Hagedorn et al. determined that the presence of a critical mass of Latino students and faculty was an important predictor of Latino students' success.

### **Methodology**

This study employed a quantitative research design, using descriptive and inferential statistics (*t* tests, cross-tabulations and Pearson chi-square tests, and logistic regression). The study was based on data garnered from DMACC's existing student records database entitled Banner. All nonidentifiable student records from all levels of DMACC Urban Campus noncredit ESL courses were gathered starting in the Fall 2005 term through the Spring 2014 term. Independent variables such as gender, ethnicity, race, residency status, and age were examined. In addition, course-taking patterns, such as number of courses taken, level of first course, and level of last course, for each student were generated. These independent variables were compared to one dependent variable: whether or not the student had matriculated to college courses. This study was delimited to students who had taken noncredit ESL classes at DMACC Urban Campus as opposed to students in the entire

district. Doing this created avenues for future studies and also provided adequate datasets for analysis.

### **Significance of Study**

Numerous academics and politicians have touted the need for an increased level of education for the U.S. population in order to increase earnings, decrease the need for social services, and increase the tax base (Baum, Ma, & Payea, 2013). In two reports published in the last decade, *Rising Above the Gathering Storm* (Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine, 2005) and *Rising Above the Gathering Storm Revisited: Rapidly Approaching Category 5* (Members of the 2005 “Rising Above the Gathering Storm” Committee, 2010), the authors recommended numerous federal initiatives in policy, funding, education, and research. These recommendations were presented in order to move the United States back into the global rankings for competitiveness in economic areas, human capital, and employability. The revisited report documented that little had changed over the 5-year span and that companies in the United States continued to move jobs to countries where the populations were “often better educated.”

The population of students who have taken a course in the noncredit ESL program at DMACC Urban Campus was just over 9,600 within the 2005 to 2014 academic year time period. Despite this high number of students served over the years, capacity issues have prevented DMACC Urban Campus from serving all the students who seek out these noncredit ESL classes; over the last three years, the program has turned away more than 150 students per term due to full classes. This represents a large number of students in central Iowa who elected to improve their language skills, mainly to enhance their job prospects.

Unfortunately, only a relatively small number, 440 or about 4.9%, elected to continue their coursework to postsecondary education. This study investigated demographic factors and course-taking patterns in order to identify the differences in these populations by identifying the difference in variables between the students who matriculated and those who did not matriculate.

This study was limited in scope in terms of variables and population but aimed to inform future studies and create a methodology for replication for other noncredit ESL populations, their course-taking patterns, and their matriculation to college.

### **Definitions**

English as a Second Language (ESL) courses: courses offered at DMACC Urban Campus at various levels. The beginning tier consist of seven levels beginning at Basic Beginning I (BB1) and Basic Beginning II (BB2) through Levels One through Five; the second tier comprises developmental college credit courses consisting of five courses offered in grammar, listening, conversation skills, and reading; the third tier consists of two college-level, transferable credit courses in grammar and writing.

English Language Learners ELL: a term used in conjunction with ESL, commonly in the K–12 education system, as younger students tend to be learning their first and second languages simultaneously.

DMACC: Des Moines Area Community College, which consists of six campuses located in central Iowa and serves over 30,000 community members with various college programs and continuing education services.

Limited English proficient (LEP): “individuals who do not speak English as their primary language and who have a limited ability to read, speak, write, or understand English can be limited English proficient” (LEP.gov, 2014, FAQ 1) or any person age 5 or

older who self-identifies as speaking English “not at all” or “not well” (Migration Policy Institute, 2014).

## CHAPTER 2. LITERATURE REVIEW

In her comprehensive literature review on the adult English language learning population in the United States, Shank (1986) stated that little research on the course-taking patterns and studies of this population had been done and recommended that further research be done to support this group of students. This researcher found that between 1986 and 2014, still little research had been done on adult ESL students' course-taking patterns or matriculation to college. Numerous studies and reports had been completed on the teaching pedagogy and andragogy of this population, but little work concentrated on the characteristics and course-taking patterns (Kanno & Varghese, 2010; Mathews-Aydinli, 2008; Razfar & Simon, 2011). Research projects and organizations, such as the TELL (Teacher Effectiveness for Language Learning) Project, which focuses on teacher effectiveness, multiple articles in the CAELA (Center for Adult English Language Acquisition), and TESOL (Teachers of English to Speakers of Other Languages) are just a few of the many great resources for teaching ESL students. Another resource for instructors and support staff is the National College Transitions Network, which offers toolkits and curricula designed to encourage adult literacy students to matriculate to college. These resources focus on what teachers can do in the classrooms, but none of these were found to study the characteristics and course-taking patterns of noncredit ESL students.

This chapter provides a thorough review of the small body of literature on ESL student matriculation from noncredit ESL to college credit courses. One study was found on noncredit ESL to college credit ESL or regular college credit classes. To find similar bodies of work, intensive developmental ESL (which includes international students) to university or college-level coursework studies as well as high school equivalency programming (GED



/HiSET [High School Equivalency Exam]) to college and developmental courses to college-level courses studies were examined.

### **Noncredit ESL to College**

In 2006, a longitudinal study was launched to study the noncredit ESL population at the City College of San Francisco (Spurling, Seymour, & Chisman, 2008). As an open entry program, noncredit ESL students could start at any time in one of 76 different level courses. The study included 44,761 students and examined their enrollment records over 7 years. The study examined ESL student demographics, enrollment trends, persistence of noncredit and credit ESL students, levels of advancement, transitions to credit courses, and success rates of the ESL population in credit courses. The majority of the students in this study started at very low levels of English proficiency and had low rates of term-to-term persistence, with 30% stopping out. Of the 8% of noncredit ESL students who matriculated to college-level courses, 75% were enrolled in developmental ESL courses and 25% earned a credential (which was three times the rate of students who were native English speakers). With findings based mainly on percentages of the student population, no predictive analysis was found in this report.

### **ESL Courses to College**

Studies of credit ESL students in 2- and 4-year institutions provide valuable student perspectives. Kanno and Varghese (2010) interviewed 33 students at a 4-year university and found that students struggled not only with linguistic challenges but also with the structure of the university's policy in admitting ESL students (which required proof of English proficiency or taking additional courses) and financial and time costs associated with these barriers. This research also identified the stigma attached to the ESL student status; the courses were not classified by the university as remedial but were informally viewed as such,

and students didn't feel they were full-fledged members of the institution. The interviews also revealed that students felt the most difficult barrier related to diversity was being identified as an ESL student over being identified as a low-income student, first-generation college student or ethnic minority student. Kanno and Varghese recommended that the higher education system expand its view of serving ESL students from strictly remediating students' skills to "a more comprehensive set of educational policies that address their limited social, cultural, and linguistic capital" (p. 324) and also address structural inequities this population faces in the postsecondary system.

Using the same population as Hagedorn, Chi, Cepeda, and McLain's (2007) dataset on urban community colleges, Razfar and Simon (2011) examined longitudinal data on Latino community college students in California. Course-taking patterns of credit ESL students were examined along with qualitative data to supplement the findings. Credit ESL students were identified as linear mainstreamers (students who enrolled in a college-level course for the first time after ESL courses), concurrent mainstreamers (students who enrolled in a college-level course for the first time while concurrently enrolled in an ESL course), or nonmainstreamer (a student who never took courses outside of ESL or developmental tracks). Also identified were their educational goals, educational background, types of college-level courses taken, passing of said courses, success rate, initial ESL level, ESL progress, overall GPA, and course completion rates. The researchers found that the majority of this credit ESL course-taking population dropped out after one or two semesters, thus making the likelihood of their progression to college-level courses limited. The lower the level of ESL courses a student took, the less likely it was that the student would progress through the entire ESL program and on to college-level courses. Although many members of

this population did not mainstream, the most successful of the mainstreamers were concurrent students or the students who took ESL courses along with college-level courses. Of this concurrent population, neither beginning ESL level nor prior education level had an effect on their success. Also focusing on the credit ESL population at a community college in Illinois, Bers (1994) found that differences in ESL students' GPA could be predicted only by the age of the student; older students tended to have higher GPAs than did younger students. No differences were found in regard to ethnicity, race, or gender.

Hodara (2014) examined the course-taking patterns of college-level ESL students in comparison with their non-ESL peers in developmental English courses. She found that students who initially took an ESL course ranged from 3 to 7 college credits behind their developmental course-taking peers in their first 2 years of college, despite the same initial scores on placement exams.

Thus, this researcher has identified a clear gap in the knowledge surrounding the noncredit ESL population. One study found that length of time studying English, the ability to self-evaluate reading skills, and student educational level was the most effective combination of background variables to predict writing and reading scores (Eunseok & Jin, 2013) but did not focus on matriculation past noncredit ESL courses. As stated by Mathews-Aydinli (2008), the research on this population is not adequate. In her comprehensive literature review of studies of ESL populations from 2000 to 2008, entitled "Overlooked and Understudied? A Survey of Current Trends in Research in Adult English Language Learners," Mathews-Aydinli split the 41 studies she found into three categories: ethnographic works, teacher-related studies, and second language acquisition studies. None of the studies Mathews-Aydinli reviewed examined noncredit ESL adult students' patterns of enrollment or

matriculation to college. It was also found that the majority of the studies were qualitative in nature (Mathews-Aydinli, 2008). The total number of studies on this topic indicates a problem surrounding knowledge about this population.

In an effort to find course-taking patterns of similar populations, the present study looked into two distinct areas besides the matriculation of ESL students to college. The first area examined was the GED/HiSET student population and their paths to college. However, little research was found in the area of GED/HiSET completers to community college matriculation as well. The second area concentrated on the climb of students in developmental courses to college-level coursework.

### **GED/HiSET to College**

Many studies have concentrated on the techniques and approaches to getting GED/HiSET students interested in college. Zafft (2008) cited approaches such as general advising models that are informative in nature and can consist of workshops, presentations, and individual advising sessions for GED students. Also noted was the GED Plus model, which accelerates the GED acquisition process and aligns the curriculum with college preparatory curriculum. In addition to these, the career pathways model, which integrates GED preparation with advanced training and college-level programs dependent on local employment needs, is also touted as an effective technique to getting students matriculated (F. Johnson, 2013; Mageehon, 2013) and is similar in design to the state of Washington's Integrated Basic Education and Skills Literacy Training (I-BEST) Program (Washington State Board for Community and Technical Colleges, 2015). The I-BEST model pairs basic skills instructors with professional technical instructors to jointly teach college-level technical occupational courses. The students learn basic skills, such as adult literacy skills, in conjunction with professional technical college-level skills. Wachen, Jenkins, and Van

Noy (2011) have studied the outcomes of the I-BEST model and found that students who participated in this model had greater basic skills gains and were more likely to earn college credits and complete a credential than were other basic skills students.

A 3-year longitudinal study funded by the American Council on Education, which examined a cohort of 148,000 GED candidates, found that almost 43% of the candidates who earned a GED matriculated to college within 7 years. Although the cohort did not look significantly different from high school graduates, the GED graduates were much more likely than were high school graduates to complete a 2-year degree as opposed to a 4-year degree. Maralani (2011) also found that the main differences between high school graduates and GED graduates were the ages of the students upon entering college and also the type of college attended. GED students were more likely to be over 21 when entering college and also were found to attend 2-year institutions at higher rates than were high school graduates.

In 2011, Ryder published a first-of-its-kind work on GED students in the state of Iowa. Using a GED student cohort from 2003–2004, Ryder found that age, racial/ethnic status, employment at the time of GED enrollment, tested academic ability, and personal goals influenced the likelihood of a student earning a GED. Of particular interest to this researcher is Ryder's study of GED graduates' matriculation to college. The study found that factors such as gender, age, race, and GED reading and social studies scores influenced the likelihood that a GED graduate would enroll in an Iowa community college. In this cohort, female students were found to have a higher probability of enrolling in community college credit courses compared to males. Also, younger students were predicted to enroll at lower rates than older students and Black GED graduates were found to be 8% more likely to enroll than White GED graduates. Additionally, students who scored high on reading and social

studies GED exams enrolled at higher rates. Ryder examined the rates of GED students completing a community college credential as well and found that a student's age (being younger), total GED score (higher), and goals of transferring increased the likelihood of a GED graduate completing a college credential. Recommendations from Ryder's study focused on both supporting the student while completing the GED, such as locating GED centers in areas accessible and welcoming to racial and ethnic minorities, offering additional instructional sessions for students age 35 and older, and connecting GED preparation services with or locating them at workforce centers. Ryder also recommended additional support be directed toward students to encourage them to set goals for after completion of the GED. Recommendations also included development of a seamless model for GED graduates to transition to workforce training or college.

Similar results were found in a national study completed by the GED Testing Service (Zhang, Guison-Dowdy, Becker Patterson, & Song, 2011). In an examination of a cohort from 2003–2004, females, younger students, and students who had higher GED tests scores had higher rates of matriculation in postsecondary institutions, and the majority of these enrollees were at 2-year colleges (Zhang et al., 2011).

### **Developmental Coursework to College**

Resources spent on developmental education at community colleges have received increased scrutiny in the past few years. Bailey (2009) stated that “developmental education is one of the most difficult issues confronting community colleges” (p. 11) because the colleges are charged with delivering college-level material, yet students are underprepared academically for this type of work. It is estimated that at least two-thirds of community college students are not academically prepared for college work in at least one area and that 60% of first-time community college students are enrolled in developmental coursework

(Bailey, 2009). The financial implication of this lack of academic skills translates into \$2.31 to \$2.89 billion in annual total educational costs (Strong American Schools, 2008). Not calculated in this cost is the loss of students' time in lost earnings while a student works through developmental coursework when they could be completing courses that would count toward a degree (Bailey, 2009).

Adelman (1996) stated, "Deficiencies in reading skills . . . significantly lower the odds of a student completing any degree" (p. 56). Students who enroll in developmental courses graduate only at a rate of less than 25% within 8 years compared with a 40% rate for students who do not enroll in developmental courses. This low rate of completion could reflect numerous different issues such as the psychological impacts of placement into "remedial" coursework or the amount of time to degree (Bailey, 2009).

Developmental education can extend the length of time to degree when students begin courses two, three, or even more levels below degree-satisfying courses. Another concern with developmental education is the high rate of students not completing developmental coursework. Bailey (2009) found that approximately 44% of the students enrolled actually completed the developmental sequence for reading and only 31% completed the sequence for math. Like noncredit ESL programming, despite the enormous financial and time costs associated with developmental education, there is a surprising lack of academic research related to determining the fundamental causes of this issue (Bahr, 2010; Bettinger & Long, 2005; Levin & Calcagno, 2008). Crisp and Delgado (2014) found that students who enroll in developmental course work are significantly different from community college students in regard to gender, ethnicity, first-generation status, academic preparedness and experiences during high school, and delaying entry into college immediately following high school.

Their research also found that enrollment in developmental courses may decrease the odds of students effectively transferring to a 4-year institution.



### **CHAPTER 3. METHODOLOGY**

This chapter describes the methodology used in this research. An overview of the analytic approaches used and an outline of the research design are included. The methods and procedures for data collection and analysis are given along with the identification of independent and dependent variables. The conceptual framework guiding the study also is provided.

#### **Overview**

In collaboration with the DMACC Institutional Research office, this research examined 989 records of ESL students enrolled in noncredit coursework at DMACC Urban Campus. All these students were enrolled in noncredit ESL courses at some point between the Fall 2005 term and the Spring 2014 term. Due to inadequate recordkeeping, the total number of students enrolled in this time period was 9,625, yet only 989 records had complete records. The demographic and course-taking pattern data were then correlated with enrollment in college-level courses. All the data were collected through DMACC's student records system entitled Banner. The data were gathered with no identifying student information to ensure student confidentiality. Descriptive statistics, *t* tests, cross-tabulations and Pearson chi-square tests, and logistic regression were used to examine the trends of course-taking patterns and the factors that correlated with enrollment in college-level courses. All data analysis was conducted using IBM SPSS.

The English as a Second Language program has been in existence since 1978, yet no descriptive or predictive research has been completed on this population of students. With the number of students that has been served over the years, DMACC's Institutional Research office supports these inquiries to guide future recruiting and retention efforts in order to increase the number of community college graduates.

The following research questions guided the study.

1. What are the demographics (gender, ethnicity, race, residency status, age group, total number of courses taken, level of first course taken, and level of last course taken) of the noncredit ESL student population at DMACC Urban Campus and what were their characteristics prior to beginning their noncredit ESL course work?
2. Are there any statistically significant differences between noncredit ESL students who matriculated and those who did not matriculate to college in terms of gender, ethnicity, race, residency status, age group, and course-taking patterns?
3. To what extent do noncredit ESL students' demographics (gender, ethnicity, race, residency status, and age group) and learning experiences (total number of course levels taken, first and last level of courses taken) predict their matriculation to college-level courses?

### **Hypotheses**

Two null hypothesis were established regarding the effect of students' background characteristics on the likelihood that they will matriculate to college.

H<sub>0</sub><sup>1</sup>: There are no statistically significant relationships between noncredit ESL students who matriculated and those who did not matriculate to college in terms of gender, ethnicity, race, residency status, and age group.

H<sub>0</sub><sup>2</sup>: There are no statistically significant relationships between noncredit ESL students who matriculated and those who did not matriculate to college in terms of learning experiences (total courses taken, first and last level of courses taken).

The noncredit ESL program at DMACC Urban Campus consists of seven levels of English language courses ranging from preliteracy to intermediate levels of instruction. These beginning levels of instruction are offered at no charge to the student and are funded by state, federal, and institutional dollars. In addition to noncredit instruction, credit-bearing college preparatory ESL courses are offered at the college level as are transferable advanced college-level ESL writing and ESL grammar courses. Both the college preparatory ESL courses and the advanced ESL courses charge college tuition and appear on students' credit transcript.

### **Data Source**

This study used an existing dataset derived from DMACC Banner student records system. All student-identifying data were removed prior to examination to prevent violation of student confidentiality.

### **Demographic Data**

The data were originally entered into the Banner system when a student registered for any level of noncredit coursework at DMACC. The data consisted of a student's first, middle, and last name; age; gender; residency status; ethnicity; and race. Unique identifiers were assigned to each student before registration. After this information was entered, students were enrolled in a noncredit ESL course according to their respective test scores from the CASAS test. Test score data was not inputted into Banner.

### **Course-Taking Data**

This study examined the course-taking patterns and demographics of noncredit ESL students and their subsequent enrollment or nonenrollment in college-level courses at DMACC. The time frame from which the data were taken ran from the Fall 2005 term

through the Spring 2014 term. Ending the time frame at the Spring 2014 term ensured recent data and ensured a time frame that was long enough time for a student to begin at the preliterate level of noncredit ESL (Beginning Basic 1), take each noncredit ESL course once per term for seven terms, and then matriculate into DMACC college-credit-bearing courses in the Spring 2014 term. Between the Fall 2005 and Spring 2014 terms, a total of 9,625 students registered for noncredit ESL courses. Due to inadequate recordkeeping, only 989 of these students had demographic information inputted into Banner. This study concentrated on the characteristics of these 989 students.

### **Study Variables**

#### **Independent Variables**

Independent variables for this study were grouped into two areas—demographic variables and course-taking variables—as described below.

**Demographic variables.** This group of variables comprised the demographic information for the noncredit ESL population: the students' gender, age, residency status, ethnicity, and race. These data, collected at the time of a student's first enrollment, were categorical in nature except for age, which was continuous. The first research question addresses these demographics, asking what the known characteristics of these students were prior to their enrollment at DMACC. As shown in Table 3.1 and Appendix A, gender was categorized as female (coded as 0) and male (coded as 1). Age was measured at time of first enrollment. Due to the wide range of ages within this population (15 to 77 years of age), ages were categorized as under 18 years of age (coded as 0), 18–20 years of age (coded as 1), 21–30 years of age (coded as 2), 31–40 years of age (coded as 3), 41–50 years of age (coded as 4), 51–60 years of age (coded as 5), 61–70 years of age (coded as 6), and 71 years of age

and over (coded as 7). Residency was categorized as citizen (coded as 1), noncitizen (coded as 2), and permanent resident (coded as 3). Ethnicity and race were categorized in the same manner as on the DMACC application. Ethnicity was categorized as Hispanic/Latino (coded as 0) and non-Hispanic/Latino (coded as 1). Race was categorized as Black (coded as 0), Alaskan/Native American (coded as 1), Asian/Pacific Islander (coded as 2), White/non-Hispanic (coded as 3), more than one checked (coded as 4), and unknown (coded as 5).

Table 3.1

*Independent Variables: Demographics*

Variable	Category coding	Variable	Category coding
Gender		Residency	
Female	0	Citizen	1
Male	1	Noncitizen	2
Missing	2	Permanent resident	3
Age group (at time of first enrollment)		Ethnicity	
Under 18 years of age	0	Hispanic/Latino	0
18–20 years of age	1	Non-Hispanic/Latino	1
21–30 years of age	2	Race	
31–40 years of age	3	Black	0
41–50 years of age	4	Alaskan/Native American	1
51–60 years of age	5	Asian/Pacific Islander	2
61–70 years of age	6	White/non-Hispanic	3
71 years of age or older	7	More than one checked	4

*Note.* All data are categorical except age, which is continuous; all data derived from Des Moines Area Community College (2014a).

**Course-taking patterns.** This group of variables comprised data concerning the most recent (ending) term of noncredit ESL enrollment, the first (beginning) term of enrollment, and total levels completed. All of these variables were categorical in nature. As shown in Table 3.2, the levels were coded as BB1 (Preliteracy) = 1, BB2 (Basic Beginning) = 2, L1 (Level One) = 3, L2 (Level Two) = 4, L3 (Level Three) = 5, L4 (Level Four) = 6, L5 (Level

Table 3.2

*Independent Variables: Course-Taking Assignments*

Variable	Category	Variable	Category	Variable	Category
Level of first (beginning) course		Level of last (ending) course		Total Levels completed	1-7
BB1 (Preliteracy)	1	BB1 (Preliteracy)	1		
BB2 (Basic Beginning)	2	BB2 (Basic Beginning)	2		
L1 (Level One)	3	L1 (Level One)	3		
L2 (Level Two)	4	L2 (Level Two)	4		
L3 (Level Three)	5	L3 (Level Three)	5		
L4 (Level Four)	6	L4 (Level Four)	6		
L5 (Level Five)	7	L5 (Level Five)	7		

Five) = 7. These levels were identified as the first (beginning) course level taken and also as the last (ending) course level taken. These courses were not graded and subsequent enrollment in the next level was considered as passing the previous course.

**Dependent Variable**

This study had one dependent variable: enrollment in college-level courses. This variable did not distinguish between credit ESL courses, developmental college courses, or regular college courses. As shown in Table 3.3, the variable was coded as a categorical dependent variable: non-enrollment in any college course = 0 and enrollment in any college course = 1.

Table 3.3

*Dependent Variable: Matriculation to College Courses*

Variable	Category
Enrollment in any college course	
No	0
Yes	1

### **Conceptual Framework**

This study utilized a conceptual framework that connected the variables of the study with the theoretical framework expressed in the introductory chapter. The first of these theoretical frameworks was Bean's (1980) student attrition model, the second was Becker's (1964) theory of human capital, and third was Hagedorn, et al.'s (2007) theory of Latino community college students as a critical mass.

The ESL program at DMACC Urban Campus has served numerous students over the years. One aspect that this study attempted to examine is the demographics of the noncredit ESL students that were retained and matriculated to college-level courses. Attrition in this area of adult literacy can be as high as 80% in the first 12 months (Porter, Cuban, & Comings, 2005). Numerous factors can contribute to a student's path to or away from college, but Bean's (1981) model of student attrition shows that a student's background characteristics, in addition to organizational variables, environmental variables, and attitudinal and outcome variables, contribute to a student's staying or leaving college. This model has been used for various groups such as nontraditional students (D. R. Johnson, 1991), older students (Farabaugh-Dorkins, 1991), women (Bean & Creswell, 1980), and community college students (Stahl & Pavel, 1992). The present study focused on the background of noncredit ESL students and capitalized on the work of Bean (1980, 1981) in assessing the background factors that may or may not predict students' matriculation to college-level courses. Tracking the organizational, environmental and attitudinal, and outcome variables is beyond the scope of this study.

Becker (1964) defined human capital as akin to physical or financial assets and used the example of investing in education as an asset. When one invests in an education or training, one is investing in oneself. This investment in turn raises the financial value of a

person in terms of personal earning potential. This is demonstrated in studies that have examined the rates of earnings for people in the United States who fail to earn a high school diploma; according to the U.S. Department of Labor's Bureau of Labor Statistics (2104) from 2013, this population earns on average \$472 dollars per week as compared to \$651 per week for a person with a high school credential. The population that goes on to engage in additional training and education beyond a high school diploma tends to earn an additional \$255 to \$1,242 per week more than a person without a high school credential. Clearly, an investment in education and training over a lifetime can have dramatic implications for a person and a family. Becker concentrated his work on education and economics, but the theory of human capital has direct implications on ESL students because these individuals are looking to improve their skills and raise their own human capital. Students come to the community college for a variety of reasons on both the credit side as well as the noncredit side of the colleges. Valentine's (1990) study of Adult Basic Education (ESL and GED) students in Iowa also cited seven additional reasons why students participate, including being able to help people in one's native country, improving reading and writing skills in English, being able to help one's children with homework and to speak with their teachers, functioning better with such everyday activities as shopping and using the phone, experiencing the success of knowing that one can learn the language, and improving one's employability by being better able to enter job training or get a better job. This last reason underscores Becker's theory of human capital.

The present study also used Hagedorn et al.'s (2007) work with the TRUCCS questionnaire and subsequent dataset in California as a third theory to support its conceptual framework. Hagedorn et al.'s work concerning Latino students in urban settings examined



course completion rates and GPAs with regard to age, gender, socioeconomic status, employment, and numerous other demographic and attitudinal variables. In examining the success rates and the demographics of the students and faculty, Hagedorn determined that the presence of a critical mass of Latino students and faculty was an important predictor of Latino students' success. Hagedorn et al.'s study of Latinos as a critical mass provides a level of comfort for students that encourages success.

### **Data Analysis**

Due to the lack of complete demographic data over the years, the sample size of 989 students was derived from the total number of 9,625 students who had enrolled in a noncredit course during the Fall 2005 semester through the Spring 2014 semester. Descriptive statistics (frequency counts, percentages, means, medians, and standard deviations) were utilized for each of the independent variables. Cross-tabulations and Pearson chi-square tests as well as *t* tests were run to determine the significance level of the difference between course levels completed and whether a student matriculated to college-level courses. The logistic regression method was applied to the data to determine predictions for each demographic variable for the noncredit ESL population.

### **Descriptive Statistics**

Research question 1 addressed the demographics of the noncredit ESL population at DMACC Urban Campus. Using descriptive statistics to examine this data gave much-needed information about the population and were used to summarize, organize, and simplify the data (Gravetter & Wallnau, 2007).

Research question 1: What are the demographics (gender, ethnicity, race, residency status, age group, total number of courses taken, level of first course taken, and level of last course taken) of the noncredit ESL student population at DMACC Urban

Campus and what were their characteristics prior to beginning their noncredit ESL course work?

### **Comparative Statistics**

Research question 2 addressed the differences between the students who enrolled in a college course and those who did not enroll in a college course. Inferential statistics were used to allow this researcher to study the sample and then make generalizations between the populations (Gravetter & Wallnau, 2007). Cross-tabulations and Pearson chi-square tests as well as *t* tests were used to compare means.

Research question 2: Are there any statistically significant differences between noncredit ESL students who matriculated and those who did not matriculate to college in terms of gender, ethnicity, race, residency status, age group, and course-taking patterns?

### **Logistic Regression**

Addressing the third research question depended on a binary dependent variable. Students were coded as “1” if they had matriculated to college-level courses or “0” if they had not. With this binary variable, logistic regression was used to evaluate the odds or probability of matriculating to college or not matriculating (Tabachnick & Fidell, 2007). Logistic regression was applied to the data to predict whether a student would matriculate to college-level courses based on the independent variables.

Research question 3: To what extent do noncredit ESL students’ demographics (gender, ethnicity, race, residency status, and age group) and learning experiences (total number of course levels taken, first and last levels of courses taken) predict their matriculation to college-level courses?

### **Limitations**

The data analyzed in this research came from an existing, secondary resource dataset, which limited the demographic variables that could be examined. The dataset did not include grades, as the noncredit ESL program does not produce grades. It also did not include pretest or posttest scores that were used for course placements. Personal goals, prior levels of education, country of origin, family size, and socioeconomic status also were not examined. Other data not included in this research was information about the teaching methodology, length of class time, total number of instructional hours, course time of day and day of the week, course repetition, and teachers' credentialing.

Students who make the necessary gains each term to be successful proceed to the next level of noncredit ESL courses. This research did not examine the reasons why many students repeated courses and failed to progress to the next level. Repeating courses increases the length of time that a student enrolls in a noncredit ESL program, which could impact a student's decision to matriculate or not matriculate.

Another limitation to this study was the length of time the dataset covered. Noncredit ESL courses have been offered in various forms at DMACC for over 35 years. A limitation to this study was the time frame to which the analysis could be applied consistently. Issues with the lack of consistent recordkeeping over time proved to be limiting. Numerous changes to the records systems, such as from quarter systems to semesters, updates to curriculum and course progressions, and inconsistencies in enrollment recordkeeping over the years, contributed to the limitations of this research. Going back to 2005 ensured fairly consistent data records; before this time frame the data were inconsistent and thus not included.

A total of 9,625 students from DMACC Urban Campus were enrolled during the time frame examined for this study, but only 989 student records had data that included gender, ethnicity, race, residency status, and age. Due to this inadequate recordkeeping, the analysis included information only on 989 students who had complete data. Although the percentage of students who matriculated could have been determined from this total enrollment, a limitation is present in that the descriptive and predictive analysis was only performed on 989 students. However, the demographics of this study's 989 student sample differed by less than 3% from the DMACC Urban Campus's 2014–2015 noncredit ESL students demographics (see Appendix B) found in the Iowa Department of Education's (2015) TopsPro Enterprise database. Thus, the sample used in this study was fairly representative of the demographics of the current total noncredit population of DMACC Urban campus. Due to numerous reporting changes from years 2005 to 2014, the Iowa Department of Education's database was not utilized for this study.

Each research question, the independent and dependent variables, and the methods of analysis for each of this study's three research questions are summarized in Table 3.4.

Table 3.4

*Summary of Research Question, Dependent Variables, and Methods of Analysis*

Research question	Variable	Method
Research question 1: What are the demographics (gender, ethnicity, race, residency status, age group, total number of courses taken, level of first course taken, and level of last course taken) of the noncredit ESL student population at DMACC Urban Campus and what were their characteristics prior to beginning their noncredit ESL course work?	Gender, ethnicity, race, residency status, age group, total number of courses taken, level of first course, and level of last course	Descriptive statistics
Research question 2: Are there any statistically significant differences between noncredit ESL students who matriculated and those who did not matriculate to college in terms of gender, ethnicity, race, residency status, age group, and course-taking patterns?	Gender, ethnicity, race, age group, residency status, total number of courses taken, level of first course taken, and level of last course taken	Cross-tabulations/ Pearson chi-square tests  <i>t</i> tests
Research question 3: To what extent do noncredit ESL students' demographics (gender, ethnicity, race, residency status, and age group) and learning experiences (total number of course levels taken, first and last levels of courses taken) predict their matriculation to college-level courses?	Matriculation or nonmatriculation to college-level courses	Logistic regression

## **CHAPTER 4. RESULTS**

This chapter presents the results of the statistical analyses conducted using data from pre-existing student enrollment records from noncredit ESL DMACC Urban Campus students from the Fall 2005 term to the Spring 2014 term. A total of 9,625 students were enrolled during this time frame. Due to inadequate recordkeeping, the analysis included information only on 989 students who had complete data within the DMACC System. As guided by the research questions, the analysis involved first examining the demographics (gender, ethnicity, race, residency status, and age group) of the entire noncredit ESL student population at DMACC Urban Campus and, second, examining the course-taking patterns of this population. Next, the demographics of the noncredit ESL students who matriculated to college versus the students who did not matriculate were examined. The fourth part of the analysis involved determining the statistical differences in course-taking patterns between the matriculating students versus the students who did not matriculate. Finally, the analysis examined what contributed to and could predict students' matriculation or nonmatriculation to college-level courses.

### **Demographic Characteristics of Noncredit ESL Students at DMACC Urban Campus**

The first research question asked: What are the demographics (gender, ethnicity, race, residency status, age group, total number of courses taken, level of first course taken, and level of last course taken) of the noncredit ESL student population at DMACC Urban Campus and what were their characteristics prior to beginning their noncredit ESL course work? The first section of this chapter identifies these demographics. As previously mentioned, data from DMACC's enrollment management system included demographic data

for 989 noncredit ESL students from the Fall 2005 semester through the Spring 2014 semester.

Descriptive statistics for the demographic characteristics of the 989 students with adequate information from the Fall 2005 semester through the Spring 2014 semester are provided in Table 4.1. The majority of the students (59.5%) were female. The ages of the students ranged from 15 to 77 years of age at the time of their first enrollment. The largest age group was 21–30 years of age (41.7% of the population).

The racial and ethnic characteristics of this group were understandably different than the norm for their age group in the state of Iowa and also differed from the college population at DMACC Urban Campus. The population of the state of Iowa consists of 2.9% Black/African American, 0.4% American Indian/Alaska Native, 1.8% Asian/Pacific Islander, 1.8% two or more races, 5.0% Hispanic/Latino, and 91.3% non-Hispanic/Latino White according to the U.S. Census Bureau (2010). According to the DMACC (2014a) Institutional Research Office, during the Fall 2014 term, DMACC Urban Campus's college-level courses enrollees consisted of 0.33% Alaskan/Native American, 7.8% Asian/Pacific Islander, 20.8% Black/African American, 10.2% Hispanic/Latino, 52.6% White/non-Hispanic/Latino, and 3.6% two or more races (4.5% chose not to reply). In this study, 23% of the students identified as Hispanic/Latino, 22.3% as Black/African-American, 0.1% as Alaskan/Native American, 35.2% as Asian/Pacific Islander, 37.4% as non-Hispanic/Latino White, and 5.0% as two or more races (Table 4.1, Figure 4.1).

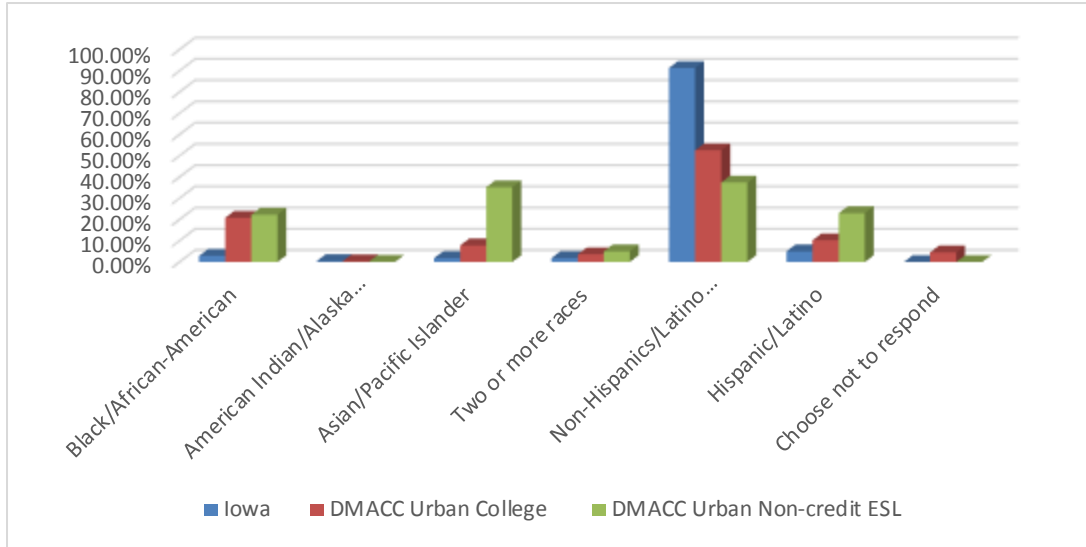
The breakdown of residency statuses of the students in the study also is shown in Table 4.1. The results showed that 81.7% of the students were citizens of Iowa, whereas 2.5% identified as permanent residents. Another 15.8% reported they were noncitizens,

Table 4.1  
*Study Population Demographics (N = 989)*

Variable	<i>n</i>	%
<b>Gender</b>		
Female <sup>a</sup>	586	59.3
Male	397	40.1
Missing	6	0.6
<b>Age group at time of initial enrollment</b>		
Under 18 years of age	24	2.4
18–20 years of age	129	12.9
21–30 years of age <sup>a</sup>	411	41.7
31–40 years of age	266	26.8
41–50 years of age	119	12.0
51–60 years of age	35	3.6
61–70 years of age	4	0.4
71 years of age or older	1	0.1
<b>Ethnicity</b>		
Hispanic/Latino	227	23.0
Non-Hispanic/Latino <sup>a</sup>	762	77.0
<b>Race</b>		
Black/African American	221	22.3
Alaskan/Native American	1	.1
Asian/Pacific Islander	348	35.2
White/non-Hispanic, Latino <sup>a</sup>	370	37.4
More than one race	49	5.0
<b>Residency status</b>		
Citizen	808	81.7
Noncitizen	156	15.8
Permanent resident	25	2.5

<sup>a</sup>Modes: 0 = Female; 2 = 21–30 years of age; 1 = Non-Hispanic/Latino; 3 = White/non-Hispanic/Latino; 1 = Citizen.





*Figure 4.1. Race and ethnicity in the state of Iowa, DMACC Urban College population, and DMACC Urban Campus noncredit ESL population (Sources: Profile of general population and housing characteristics: 2010 demographic profile data (GEO: Iowa), by the U.S. Census Bureau, 2010; Banner [Student record database], by Des Moines Area Community College, 2014a).*

which DMACC categorizes as international students. DMACC does not track the refugee status of its students; however, this researcher has anecdotal knowledge that the number of refugees in this program is high.

### **Course-Taking Patterns of Noncredit ESL Students at DMACC Urban Campus**

This second section provides the results of the course-taking patterns of the 989 students in the study. The data reflected the level of the students' first course, the level of their final course, and the total number of course levels completed. The maximum number of levels of courses that a student could complete was seven, ranging from Basic Beginning 1 (1) to Level 5 (7). The data were coded as shown in Table 3.2 and Appendix A.

The mean, median, mode, and standard deviation for the students beginning, ending, and total number of course levels taken are provided in Table 4.2. The majority of the 989 students began their coursework at the Level 3 course (L3) and ended their coursework at the Level 5 course (L5). The frequencies and percentages of the 989 enrollees beginning and ending course levels are shown in Table 4.3. The data indicate that the largest percentage of students started their courses at the Level 3 course level (25.3%) and ended at Level 5 (44.2%).

Table 4.2

*Mean, Median, Mode, and Standard Deviation for Beginning, Ending, and Total Number of Course Levels Completed (N = 989).*

Course level	<i>M</i>	<i>Mdn</i>	Mode	<i>SD</i>
Beginning level	4.66	5.00	5	1.58
Ending level	5.99	6.00	7	1.25
Total number of levels completed	2.32	2.00	1.00	1.32

Table 4.3

*Frequencies and Percentages of Students Beginning and Ending Course Level (N = 989)*

Course	<u>Beginning course level</u>		<u>Ending course level</u>	
	<i>n</i>	%	<i>n</i>	%
BB1 (Preliteracy)	41	4.1	13	1.3
BB2 (Basic Beginning)	66	6.7	7	0.7
L1 (Level One)	120	12.1	32	3.2
L2 (Level Two)	178	18.0	58	5.9
L3 (Level Three)	250	25.3	143	14.5
L4 (Level Four)	220	22.2	299	30.2
L5 (Level Five)	114	11.5	437	44.2

### **Differences in Demographic Characteristics Between Nonmatriculated and Matriculated Students**

This section provides the results of the examination of the differences in demographic characteristics between the students who did not matriculate versus those who did matriculate. Matriculation was defined as enrollment in any college-level course at DMACC Urban Campus and was not delineated by subject or level of college coursework. Of the 989 students included in this data, 516 did not matriculate to college-level courses, whereas 473 students did matriculate. Both groups tended to be female citizens in the age group of 21 to 30 years of age. Of note, both groups were majority non-Hispanic/Latino but were different in terms of race. The nonmatriculated students had a mode of Asian/Pacific Islander, but the matriculated students had a mode of White/non-Hispanic. A summary of these demographics according to matriculation versus nonmatriculation is provided in Table 4.4.

Examining the entire dataset, overall more females ( $n = 260$ ) than males ( $n = 209$ ) matriculated to college, but in examining the percentages, the gap between females and males matriculating declined. Specifically, 63.2% of those who did not matriculate were female, whereas 55.0% of those who did matriculate were females. Correspondingly, 36.4% of those who did not matriculate were males, whereas 44.2% of those who did matriculate were males (see Table 4.4).

In examining descriptive statistics of the age groups, minimal differences were found between the matriculated students and the nonmatriculated students (Table 4.4). Likewise, in examining the residency status of this population, minor differences were found in the percentages of students who were citizens with the differences between the matriculated and nonmatriculated students being less than 10% regardless of their residency status (Table 4.4).

Table 4.4

*Students' Gender, Age, Residency Status, Ethnicity, and Race by Matriculation Status*

Demographic variable	<i>n</i>	%	<i>M</i>	<i>Mdn</i>	Range	Min.	Max.	Mode
Not matriculated ( <i>n</i> = 516)								
Gender								Female
Female	326	63.2						
Male	189	36.4						
No response	2	0.4						
Age at initial enrollment			29.91	28	62	15	77	21–30 years of age
Under 18 years	17	3.3						
18–20 years	72	14.0						
21–30 years	212	41.1						
31–40 years	132	25.6						
41–50 years	68	13.2						
51–60 years	13	2.5						
61–70 years	1	0.2						
71 or older	1	0.2						
Residency status								Citizen
Citizen	399	76.9						
Noncitizen	103	19.8						
Permanent resident	17	3.3						
Ethnicity								Non-Hispanic/Latino
Hispanic/Latino	122	23.5						
Non-Hispanic/Latino	397	76.5						
Race								Asian/Pacific Islander
Black/African American	116	22.5						
Alaskan/Native American								
Asian/Pacific Islander	197	38.2						
White/non-Hispanic, Latino	178	34.5						
Missing	25	4.8						
Matriculated ( <i>n</i> = 473)								
Gender								Female
Female	260	55.0						
Male	209	44.2						
No response	4	0.8						
Age at initial enrollment			30.98	29	48	16	64	21–30 years of age
Under 18 years	7	1.5						
18–20 years	57	12.1						
21–30 years	199	42.1						
31–40 years	134	28.3						
41–50 years	51	10.8						
51–60 years	22	4.7						
61–70 years	3	0.6						
71 or older	0	0						

Table 4.4 (continued)

Demographic variable	<i>n</i>	%	<i>M</i>	<i>Mdn</i>	Range	Min.	Max.	Mode
Residency status						0	6	
Citizen	409	87.0	1.15	1		1	3	Citizen
Noncitizen	53	11.3						
Permanent resident	8	1.7						
Ethnicity								Non-Hispanic/Latino
Hispanic/Latino	105	22.3						
Non-Hispanic/Latino	365	77.7						
Race								White/non-Hispanic Latino
Black/African American	105	22.2				0	1	
Alaskan/Native American	1	0.2						
Asian/Pacific Islander	151	31.9						
White/non-Hispanic, Latino	195	41.2						
Missing	22	4.5						

Looking at the ethnicity of this sample, minor differences were found in the percentages of students who identified as Hispanic/Latino or non-Hispanic/Latino with the differences of less than 2% between the matriculated and nonmatriculated students regardless of their ethnicity (see Table 4.4).

In examining race of this population, differences were found in the percentages of matriculated and nonmatriculated students. The largest difference was found in regard to students who identified as Asian/Pacific Islander and White/non-Hispanic. There were 38.2% nonmatriculated versus 31.9% matriculated students of Asian/Pacific Islander descent and 34.5% nonmatriculated versus 41.2% matriculated White/non-Hispanic students (see Table 4.4).

### **Differences in Course-Taking Patterns Between Matriculated and Nonmatriculated Students**

This fourth section concentrates on the findings regarding the second research question, which asked: Are there any statistically significant differences between noncredit ESL students who matriculated and those who did not matriculate to college in terms of gender, ethnicity, race, residency status, age group, and course-taking patterns? To

determine differences in course-taking patterns between matriculated and nonmatriculated students, data were examined using descriptive (frequencies) and inferential statistics (cross-tabulations and Pearson chi-square tests and *t* tests). For this part of the analysis, the data were grouped into low (BB1, BB2, and L1), medium (L2 and L3), and high (L4 and L5) beginning and ending course levels to account for the small values for some course levels that limited statistical analysis. For the same reason, age groups also were recoded as four groups: under 21, 21 to 30, 31 to 40, and 41 and above years of age.

### **Descriptive Statistics**

This section reviews the frequencies concerning age groups, beginning course level, ending course level, and total course levels completed between matriculated and nonmatriculated students. Using descriptive statistics to examine this data gave much-needed information about the population and were used to summarize, organize, and simplify the data (Gravetter & Wallnau, 2007).

The largest age group overall was the 21 to 30 years of age group with 411 students or 41.6% of the population. Slightly lower percentages of students in the under 21 age group matriculated (17.4% not matriculating versus 13.5% matriculating), whereas slightly more students in the 31 to 40 years of age group matriculated (Table 4.5).

Table 4.5

#### *Student Age Groups by Matriculation Status*

Age	All		Matriculated		Nonmatriculated	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Under 21 years	154	15.6	64	13.5	90	17.4
21 to 30 years	411	41.6	199	42.1	212	41.1
31 to 40 years	266	26.9	134	28.3	132	25.6
41+ years	158	16.0	76	16.1	82	15.9
Total	989	100.0	473	100.0	516	100.0

As shown in Table 4.6, when the beginning levels of coursework were compared between matriculated and nonmatriculated students, slightly more students who matriculated had started in the lower course level (25.6%) and slightly fewer matriculated when beginning at the middle course level (40.6%). When the ending levels of coursework were compared between the matriculated and nonmatriculated students, the majority of students ended at a high level regardless of whether or not they had matriculated. Students who ended coursework at the medium or high course levels tended to matriculate at about the same rates as did those who did not matriculate. When looking at total number of levels completed, students who matriculated tended to take fewer courses, with over 70% of matriculated students taking only one or two courses as compared to 50% of nonmatriculated students taking one or two courses.

### **Comparative Analysis Results**

The statistical tests conducted for research question 2 in terms of course-taking patterns all used matriculation status as a dependent variable and gender, race, ethnicity, and residency status as independent variables. Before the analysis was performed, the assumptions of the cross-tabulations and Pearson chi-square tests were checked in regards to the independent variables of gender, race, ethnicity, and residency status. With all of these variables being independent and nominal, and with at least 80% of the expected cell frequencies greater than or equal to 5, the analysis was performed (Morgan, Leech, Gloeckner, & Barrett, 2012). Cross-tabulations and Pearson chi-square tests were used to determine if students were more likely than expected to matriculate or not matriculate based on their demographic characteristics.

Table 4.6

*Students' Beginning Course Levels, Ending Course Levels, and Number of Course Levels Completed by Matriculation Status*

Course level	<i>n</i>	%	<i>M</i>	<i>Mdn</i>	Mode	<i>SD</i>
Nonmatriculated ( <i>n</i> = 516)						
Beginning level						
Low	106	20.5				
Medium	236	45.7				
High	174	33.7				
Total	516	100.0	2.13	2	2	0.73
Ending level						
Low	18	3.5				
Medium	83	16.1				
High	415	80.4				
Total	516	100.0	2.77	3	3	0.50
Total number of levels completed						
1	149	28.9				
2	121	23.4				
3	120	23.3				
4	75	14.5				
5	39	7.6				
6	11	2.1				
7	1	.2				
Total	516	100.0	2.56	2	1	1.37
Matriculated ( <i>n</i> = 473)						
Beginning level						
Low	121	25.6				
Medium	192	40.6				
High	160	33.8				
Total	473	100.0	2.08	2	2	0.77
Ending level						
Low	34	7.2				
Medium	118	24.9				
High	321	67.9				
Total	473	100.0	2.61	3	3	0.62
Total number of levels completed						
1	204	43.1				
2	130	27.5				
3	72	15.2				
4	44	9.3				
5	18	3.8				
6	4	0.8				
7	1	0.2				
Total	473	100.0	2.07	2	1	1.22



Cross-tabulations with Pearson's chi-square analysis were conducted to determine if the ESL students' matriculation numbers were proportionate by gender. The cell frequency values are shown in Table 4.7. The Pearson's chi-square value was statistically significant,  $\chi^2(2, N = 989) = 7.325, p = .025$ , indicating the groups matriculated in significantly different fashion. Specifically, fewer females matriculated than would be expected (260.0 vs. 280.3) and more males matriculated than would be expected (209.0 vs. 189.9), and significantly so (see Table 4.7).

Table 4.7

*Cross-Tabulations and Pearson's Chi-Square by Gender and Matriculation*

Matriculation status by gender	Count	Expected count	% within gender	% within matriculation status	% of total
<b>Female</b>					
Matriculated	260	280.3	44.40	55.00	26.30
Not matriculated	326	305.7	55.60	63.20	33.00
Total	586	586.0	100.00	59.30	59.30
<b>Male</b>					
Matriculated	209	189.9	52.60	44.20	21.10
Not matriculated	188	207.1	47.40	36.40	19.00
Total	397	397.0	100.00	40.10	40.10
<b>Missing</b>					
Matriculated	4	2.9	66.70	0.80	0.40
Not matriculated	2	3.1	33.30	0.40	0.20
Total	6	6.0	100.00	0.60	0.60
<b>Total</b>					
Matriculated	473	473	47.80	100.00	47.80
Not matriculated	516	516	52.20	100.00	52.20
Total	989	989	100.00	100.00	100.00
	Value	df	Asymptotic significance value (2-sided)		
Pearson chi-square	7.355 <sup>a</sup>	2	.025		
Likelihood ratio	7.370	2	.025		
Number of valid cases	989				

<sup>a</sup>Two cells (33.3%) have expected count less than 5. The minimum expected count is 2.87.

Cross-tabulations with Pearson's chi-square analysis were conducted to determine if the ESL students' matriculation numbers were proportionate by race. The counts by race of students who matriculated versus those who didn't are shown in Table 4.8. The Pearson's chi-square value was not statistically significant,  $\chi^2(4, N = 989) = 6.894, p = .142$ , indicating that the groups were not greatly disproportionate in their matriculation efforts. It should be noted that, for this variable, there were counts with fewer than five individuals, which is undesirable in a Pearson's chi-square analysis, a condition that likely impacted the analysis negatively (see Table 4.8).

Cross-tabulations with Pearson's chi-square analysis were conducted to determine if the ESL students' matriculation numbers were proportionate by ethnicity. The counts by ethnicity of students who matriculated versus those who didn't are shown in Table 4.9. The Pearson's chi-square analysis was not statistically significant,  $\chi^2(1, N = 989) = 0.056, p = .813$ , indicating that the different groups were not greatly disproportionate in their matriculation efforts (see Table 4.9).

Cross-tabulations with Pearson's chi-square analysis were conducted to determine if the noncredit ESL students' matriculation numbers were proportionate by residency. The counts by residency of matriculation versus nonmatriculation are shown in Table 4.10. The Pearson's chi-square was statistically significant,  $\chi^2(1, N = 989) = 17.927, p = .0001$ , indicating that the different groups matriculated in significantly differently. Specifically, more citizens matriculated than would be expected (413.0 vs. 387.4), but fewer noncitizens matriculated than would be expected (60.0 vs. 85.6).

Table 4.8

*Cross-Tabulations and Pearson's Chi-Square by Race and Matriculation*

Matriculation status by race	Count	Expected count	% within race	% within matriculation status	% of total
<b>Black</b>					
Matriculated	105	105.7	47.50	22.20	10.60
Not Matriculated	116	115.3	52.50	22.50	11.70
Total	221	221.0	100.00	22.30	22.30
<b>Alaskan/Native American</b>					
Matriculated	1	0.5	100.00	0.20	0.10
Not Matriculated	0	0.5	0.00	0.00	0.00
Total	1	1.0	100.00	0.10	0.10
<b>Asian/Pacific Islander</b>					
Matriculated	151	166.4	43.40	31.90	15.30
Not Matriculated	197	181.6	56.60	38.20	19.90
Total	348	348.0	100.00	35.20	35.20
<b>White/Non-Hispanic/Latino</b>					
Matriculated	195	178.4	52.30	41.20	19.70
Not Matriculated	178	194.6	47.70	34.50	18.00
Total	373	373.0	100.00	37.70	37.70
<b>Missing</b>					
Matriculated	21	22	45.70	4.40	2.10
Not Matriculated	25	24	54.30	4.80	2.50
Total	46	46	100.00	4.70	4.70
<b>Total</b>					
Matriculated	473	473	47.80	100.00	47.80
Not Matriculated	516	516	52.20	100.00	52.20
Total	989	989	100.00	100.00	100.00
			Asymptotic significance value (2-sided)		
	Value	df			
Pearson chi-square	6.894 <sup>a</sup>	4	.142		
Likelihood ratio	7.286	4	.122		
Number of valid cases	989				

<sup>a</sup>Two cells (20.0%) have expected count less than 5. The minimum expected count is 0.48.

Table 4.9

*Cross-Tabulations and Pearson's Chi-Square by Ethnicity and Matriculation*

Matriculation status by ethnicity	Count	Expected count	% within ethnicity	% within matriculation status	% of total
Hispanic/Latino					
Matriculated	107	108.6	47.10	22.60	10.80
Not matriculated	120	118.4	52.90	23.30	12.10
Total	227	227.0	100.00	23.00	23.00
Non-Hispanic/Latino					
Matriculated	366	364.4	48.00	77.40	37.00
Not matriculated	396	397.6	52.00	76.70	40.00
Total	762	762.0	100.00	77.00	77.00
Total					
Matriculated	473	473	47.80	100.00	47.80
Not matriculated	516	516	52.20	100.00	52.20
Total	989	989	100.00	100.00	100.00
	Value	df	Asymptotic significance value (2-sided)	Exact significance. (2-sided)	Exact significance. (1-sided)
Pearson chi-square	.056 <sup>a</sup>	1	.813		
Continuity correction <sup>b</sup>	.026	1	.872		
Likelihood ratio	.056	1	.813		
Fisher's exact test				.821	.436
Number of valid cases	989				

<sup>a</sup>Zero cells (0.0%) have expected count less than 5. The minimum expected count is 108.57. <sup>b</sup>Computed only for a 2x2 table.

Table 4.10

*Cross-Tabulations and Pearson's Chi-Square by Residency Status and Matriculation*

Matriculation status by residency status	Count	Expected count	% within residency status	% within matriculation status	% of total
<b>Citizen</b>					
Matriculated	413	387.4	51.00	87.30	41.80
Not matriculated	397	422.6	49.00	76.90	40.10
Total	810	810.0	100.00	81.90	81.90
<b>Noncitizen</b>					
Matriculated	60	85.6	33.50	12.70	6.10
Not matriculated	119	93.4	66.50	23.10	12.00
Total	179	179.0	100.00	18.10	18.10
<b>Total</b>					
Matriculated	473	473	47.80	100.00	47.80
Not matriculated	516	516	52.20	100.00	52.20
Total	989	989	100.00	100.00	100.00
	Value	df	Asymptotic significance value (2-sided)	Exact significance. (2-sided)	Exact significance. (1-sided)
Pearson chi-square	17.927 <sup>a</sup>	1	.000		
Continuity correction <sup>b</sup>	17.234	1	.000		
Likelihood ratio	18.261	1	.000		
Fisher's exact test				.000	.000
Number of valid cases	989				

<sup>a</sup>Zero cells (0.0%) have expected count less than 5. The minimum expected count is 85.61. <sup>b</sup>Computed only for a 2x2 table.

Course-taking patterns of students in noncredit ESL courses are not necessarily linear. Student can initially start at a medium level course and then move to a higher level course, thus progressing through the program. Alternatively, students also can initially start a high level course and then take a medium level course the next term, thus not progressing through the program yet still completing two levels of coursework. For the purposes of this next section's analysis, two variables concerning course-taking patterns were utilized. The first variable was total course levels completed by a student, regardless of direction (lower course

to higher course or higher course to lower course). The second variable utilized was progress, which was calculated by subtracting the beginning course level from the ending course level. Students who did not advance a level or who digressed were coded as zero for no progress.

An independent samples  $t$  test was conducted to determine if there were statistically significant differences between the matriculated and nonmatriculated students' number of completed course levels (ordinal variable). A two-tailed test was conducted with an alpha of .05, in accordance with accepted norms for hypothesis testing in social sciences (Hays, 1981; Howell, 2010). The results of the independent sample  $t$  tests are displayed in Table 4.11.

The  $t$  test revealed a statistically significant difference,  $t(986.271) = 5.969, p = .0001$ , in the number of completed course levels with a mean of 2.56 for nonmatriculated students

Table 4.11

*Results of  $t$  Tests of Total Number Course Levels Completed and Matriculation Status*

Group statistics: Total number of course levels completed								
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SEM</i>				
Not matriculated	516	2.56	1.366	0.060				
Matriculated	473	2.07	1.219	0.056				
Independent samples test								
	Levene's test for equality of variances		<u><math>t</math> test for equality of means</u>					
	<i>F</i>	<i>p</i>	<i>t</i>	<i>df</i>	<i>p</i> (2-tailed)	Mean difference	<i>SE</i> difference	95% CI of the difference
Equal variances assumed	18.961	.000	5.939	987.00	.000	0.491	0.083	[0.329,0 .653]
Equal variances not assumed			5.969	986.271	.000	0.491	0.082	[0.329, 0.652]

and a mean of 2.07 for matriculated students, indicating that the nonmatriculated students completed slightly more course levels than did the matriculated students completed (see Table 4.11). The Levene's test of homogeneity of variances revealed that statistically significant differences existed where the variances of these samples are concerned. Because all inferential tests are ratios of mean squares (variance) divided by mean squares within, it is important to know whether the variances of groups are not even prior to the application of the test. The *t* test analysis is adjusted in cases where variance homogeneity doesn't exist. Both equal variances assumed and equal variances not assumed results are provided by SPSS automatically (see Table 4.11).

An independent samples *t* test was conducted to determine if there were statistically significant differences between matriculated and nonmatriculated students' progress, calculated by subtracting the beginning course level (ordinal variable) from the ending course level. For those students who initially took a course at a level higher than that of their ending course level, the resulting negative values were recoded to zero indicating no progress. A two-tailed test was conducted with an alpha of .05 in accordance with accepted norms for hypothesis testing in social sciences (Hays, 1981; Howell, 2010). The results of the independent sample *t* tests analysis is displayed in Table 4.12.

The *t* test revealed a statistically significant difference,  $t(986.993) = 3.751, p = .0004$ , in student progress, with a mean of 1.5194 for nonmatriculated students and a mean of 1.1734 for matriculated students, indicating that, on average, nonmatriculated students progressed through slightly more course levels than did matriculated students (see Table 4.12). The Levene's test of homogeneity of variances revealed statistically significant differences existed where the variances of these samples are concerned. Because all

Table 4.12

*Results of  $t$  Tests of Progress, Measured by Course Levels Completed, and Matriculation Status*

Group statistics: Total number of course levels completed								
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SEM</i>				
Not matriculated	516	1.5194	1.51549	0.06672				
Matriculated	473	1.1734	1.38529	0.06370				

Independent samples test								
	Levene's test for equality of variances		<u><math>t</math> test for equality of means</u>					
	<i>F</i>	Sig.	<i>t</i>	<i>df</i>	Sig. (2-tailed)	Mean difference	<i>SE</i> difference	95% CI of the difference
Equal variances assumed	8.388	.004	3.737	987.000	.000	0.34602	0.09260	[0.16430, 52773]
Equal variances not assumed			3.751	986.993	.000	0.34602	0.09224	[0.16501, 52703]

inferential tests are a ratio of mean squares (variance) divided by mean squares within, it is important to know whether the variances of groups are not even prior to the application of the test. The  $t$  test analysis is adjusted in cases where variance homogeneity doesn't exist. Both equal variances assumed and equal variances not assumed results are provided by SPSS automatically (see Table 4.12).

### **Predictors of Matriculation Versus Nonmatriculation**

The last research question asked: To what extent do noncredit ESL students' demographics (gender, ethnicity, race, residency status, and age group) and learning experiences (total number of course levels taken, first and last levels of courses taken) predict their matriculation to college-level courses? The last section of this chapter focuses on the examination of the frequencies and logistic regression results based on the independent variables compared to matriculation.



A logistic regression analysis was performed to predict the probability that students' matriculation could be correctly classified based on the independent variables gender, ethnicity, residency, race, age groups, beginning level, ending level, and total levels completed. Logistic regression was chosen over ordinary least squares regression because the dependent variable in the analysis (matriculation) was dichotomous and because logistic regression does not require the data to meet the general assumptions of normality, linearity, and homogeneity of variances, which was an issue with this dataset (Mertler & Vannatta, 2010). Due to the low percentages of permanent residents and noncitizens, the residency variable was combined into a dichotomous variable consisting of citizens and noncitizens for this analysis. Also, the age group variable was coded into four age groups and beginning and ending level of courses were coded into low, medium, or high courses. For the race variable, dummy coding was used, and the White group was used as the reference group.

Examination of the logistic regression output showed that the analysis was run with 989 valid cases, which was 100% of the total sample. The overall percentage value showed that, without any independent variables in the model, assuming that no students matriculated would be correct 52.2% of the time. The logistic regressions were further evaluated in three sections: (a) model fit, (b) accuracy of model classification, and (c) contribution of independent variables in the model. This analysis used the demographic variables of gender, age group, race, and ethnicity in the first step and added the course-taking patterns variables in the second step.

### **Model Fit**

The  $-2$  log likelihood and the Hosmer-Lemeshow goodness-of-fit test showed that the model, with all independent variables entered, fit and was capable of predicting the

categorical outcomes of matriculation,  $-2 \log \text{likelihood} = 1369.175$ ,  $\chi^2(8, N = 989) = 6.353$ ,  $p = .608$ . For the Hosmer-Lemeshow test, a nonsignificant value is desired as evidence of good model fit. Essentially, if the value isn't statistically significant it is interpreted as a sign that the expected values of the model fit the actual values of the model, or that  $\sum = \sum\theta$  (Hoyle, 1995).

### **Accuracy of Classification**

The accuracy of the model was evaluated using several statistical indices. First, the percentage accuracy in classification was identified by examining the classification table values to assess the effectiveness of the predicted classification against the actual classification (see Table 4.13). The overall percentage value was 57.8% for the first block including demographics an improvement of 5.6% over the 52.2% overall percentage value from the model fitted with no independent variables. The overall percentage value was 61.2% for the second block including the demographics and course-taking patterns, an improvement of 9% over the 52.2% overall percentage value from the model fitted with no independent variables. The addition of the independent variables improved the classification of cases predictions. Model sensitivity, the percentage of cases that were correctly classified as having matriculated (sometimes referred to as true positives) was 61.8%, which means that 61.8% of the participants who matriculated were correctly predicted to matriculate. Furthermore, the positive predictive value, the percentage of correctly predicted cases that matriculated compared to the total of cases predicted to matriculate was 61.2%.

Model specificity, the percentage of cases correctly classified as not matriculated, was equal to 61.8%. Similar to sensitivity, the specificity value means that 61.8% of the cases that did not matriculate were correctly predicted not to matriculate. The negative

Table 4.13

*Logistic Regression Case Selection Report for Gender, Ethnicity, Residency and Race Variables*

Observed	Predicted		% correct
	Matriculated	Not matriculated	
Matriculated	253	220	53.5
Not matriculated	197	319	61.8
Overall %			57.8

Step	Model summary			Hosmer & Lemeshow test		
	-2 Log likelihood	Cox & Snell $R^2$	Nagelkerke $R^2$	$\chi^2$	df	Sig.
1	1288.788 <sup>a</sup>	.078	.104	4.230	8	.836

*Note.* The cut value for the classification table was .500.

<sup>a</sup>Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

predictive value, or the percentage of correctly predicted cases that did not matriculate compared to the total cases predicted not to matriculate, was 58.96%.

### **Contribution of Independent Variables in the Model**

The Wald test was used to assess the statistical significance of each of the independent variables (i.e., predictors). Each predictor's  $\beta$  coefficient value, Wald test value, and probability assessment are included in the variables in the equation table (see Table 4.14).

The  $\beta$  coefficients shed light on the contribution of the predictor variables by demonstrating the change in the logarithmic odds that is expected to occur for every one-unit change in the predictor when all others are kept constant. In addition, the table includes odds ratios (in the table's  $\text{Exp}(\beta)$  column) and confidence intervals for each predictor, which are believed to be easier to interpret (Menard, 2002). As shown in Table 4.14, the demographic variables of residency,  $\beta = .746$ ,  $p = .0001$ ,  $\text{Exp}(\beta) = 2.109$ ; ethnicity,  $\beta = -.654$ ,  $p = .003$ ,  $\text{Exp}(\beta) = .520$ ; and the course-taking patterns of beginning levels (middle levels)  $\beta = 1.122$ ,

Table 4.14

*Gender, Ethnicity, Residency, and Race Variables in the Equation*

Variables entered	<i>B</i>	<i>SE</i>	Wald	<i>df</i>	Sig.	Exp(B)	95% CI for Exp(B)
Gender			7.428	2	.024		
Gender(1)	-0.823	0.882	0.870	1	.351	0.439	[0.078, 2.474]
Gender(2)	-0.454	0.881	0.265	1	.606	0.635	[0.113, 3.571]
Age_4Groups	0.058	0.073	0.644	1	.422	1.060	[0.919, 1.223]
Race			11.335	3	.010		
Race(1)	-0.514	0.361	2.025	1	.155	0.598	[0.295, 1.214]
Race(2)	-0.324	0.334	0.944	1	.331	0.723	[0.376, 1.391]
Race(3)	0.221	0.368	0.359	1	.549	1.247	[0.606, 2.566]
Ethnicity(1)	-0.654	0.223	8.618	1	.003	0.520	[0.336, 0.805]
Residency(1)	0.746	0.201	13.823	1	.000	2.109	[1.423, 3.125]
BeginingLevels_3			20.355	2	.000		
BeginingLevels_3(1)	1.122	0.258	18.878	1	.000	3.070	[1.851, 5.091]
BeginingLevels_3(2)	0.224	0.181	1.538	1	.215	1.251	[0.878, 1.783]
Progress			34.980	6	.000		
Progress(1)	2.620	1.124	5.431	1	.020	13.730	[1.517, 124.285]
Progress(2)	2.410	1.128	4.563	1	.033	11.132	[1.220, 101.582]
Progress(3)	1.950	1.125	3.006	1	.083	7.032	[0.775, 63.765]
Progress(4)	1.473	1.125	1.714	1	.190	4.360	[0.481, 39.526]
Progress(5)	1.117	1.129	0.979	1	.322	3.056	[0.334, 27.941]
Progress(6)	0.841	1.164	0.521	1	.470	2.318	[0.237, 22.703]
Constant	-2.334	1.473	2.512	1	.113	0.097	

$p = .0001$ ,  $\text{Exp}(\beta) = 3.070$ ; progress (1 level),  $\beta = 2.620$ ,  $p = .020$ ,  $\text{Exp}(\beta) = 13.730$ ; and progress (2 levels)  $\beta = 2.410$ ,  $p = .033$ ,  $\text{Exp}(\beta) = 11.132$  contributed significantly to the model's predictive capacity.

For each of the categorical predictors, the lowest value group served as the reference for the logistic regression. Knowing that a predictor is statistically significant is just the first part of the model evaluation. The odds ratio for the significant predictors must also be consulted to fully understand each variable's impact on the dependent variable. For this model, citizens were 2.109 times more likely to matriculate than were noncitizens. In terms of ethnicity, non-Hispanic/Latino students were 1.92 times more likely to matriculate than were Hispanic/Latino students, with Hispanic/Latino group coded as 0 (as the reference group) and non-Hispanic/Latino groups as 1. In term of course-taking patterns, students who took one course were 13.730 times more likely to matriculate and students who took two courses were 11.132 times more likely to matriculate than were students who took all seven levels of courses.

### Summary

Two null hypothesis were established regarding the effect of students' background characteristics on the likelihood that they will matriculate to college.

$H_0^1$ : There are no statistically significant relationships between noncredit ESL

students who matriculated and those who did not matriculate to college in terms of gender, ethnicity, race, residency status, and age group.

$H_0^2$ : There are no statistically significant relationships between noncredit ESL

students who matriculated and those who did not matriculate to college in terms of learning experiences (total courses taken, first and last level of courses taken).

The results of this study led to the findings that gender, residency status, and age group were statistically significant in terms of matriculation, thus leading to the rejection of the null hypothesis  $H_0^1$ . Furthermore, the results of this study led to the findings that ending course level and total number of course levels completed were statistically significant in terms of matriculation, thus leading to the rejection of the null hypothesis  $H_0^2$ .

Cross-tabulations and Pearson's chi-squares,  $t$  tests, and logistical regression were run on the data for the 989 students examined for this study according to the dependent variable of matriculation versus nonmatriculation. For the independent variable of gender, the Pearson's chi-square value was statistically significant, indicating that fewer females matriculated than were expected. For the independent variables of race and ethnicity, the Pearson's chi-square values were not statistically significant, indicating that the different racial and ethnic groups were not disproportionate in their rates of matriculation. In terms of residency, more citizens matriculated than were expected, but fewer noncitizens matriculated than were expected. In examining the variable of total number of course levels completed, the  $t$  test analysis revealed that nonmatriculated students completed more course levels (2.56 levels) than did students who did matriculate (2.07 levels), and significantly so.

To predict matriculation or nonmatriculation in terms of gender, residency status, race ethnicity, and course-taking patterns, logistic regression analysis was performed and revealed that citizens were 2.109 times more likely to matriculate than were noncitizens. In terms of ethnicity, non-Hispanic/Latino students were 1.92 times more likely to matriculate than were Hispanic/Latino students. In term of course-taking patterns, students who took one course were 13.730 times more likely to matriculate and students who took two courses were 11.132 times more likely to matriculate than students who took all seven levels of courses.

## CHAPTER 5. CONCLUSION

This chapter includes a brief review of the theoretical framework and current literature that guided the study and then provides an overview of the study's findings. Further ideas for future research are then suggested, and the chapter also provides recommendations for policy and practice within Iowa's noncredit ESL programming. The chapter concludes with overall recommendations.

### Discussion

This study examined the demographics, course-taking patterns, and rates of matriculation to community college of noncredit ESL students at DMACC Urban Campus. When connecting the conceptual framework to the study and data, this researcher hypothesized that students' background characteristics contribute to whether or not they continue their college education as in Bean's (1981) model of student attrition. Although noncredit ESL students do not fit perfectly into this specific model because they are not students at 2-year or 4-year institutions, the model was used to ground this research. The study utilized Becker's (1964) work concerning human capital guiding the students' possible motivations toward completing courses, thus increasing their own human capital. Hagedorn et al.'s (2007) theory of Latino community college students as a critical mass also was used to ground the research, in that success in a noncredit ESL program may be due to a critical mass of minority students, thus creating a feeling of comfort. Also the lack of matriculation to college could be due to the lack of this critical mass at the college level.

Cross-tabulations and Pearson's chi-squares, *t* tests, and logistical regression were conducted on the data for the 989 students examined for this study according to the dependent variable of matriculation versus nonmatriculation. For the independent variable of gender, the Pearson's chi-square was statistically significant, indicating that fewer females

matriculated than were expected. For the independent variables of race and ethnicity, the Pearson's chi-square was not statistically significant, indicating that the different groups were not disproportionate in their rates of matriculation. In terms of residency, more citizens matriculated than were expected, but fewer noncitizens matriculated than were expected. In examining the variable of total number of course levels completed, the *t* test analysis revealed that nonmatriculated students completed more course levels (2.56 levels) than did students who matriculated (2.07 levels), and significantly so.

To predict matriculation or nonmatriculation in terms of gender, residency status, race ethnicity, and course-taking patterns, logistic regression analysis was performed and revealed that citizens were 2.109 times more likely to matriculate than were noncitizens. In terms of ethnicity, non-Hispanic/Latino students were 1.92 times more likely to matriculate than were Hispanic/Latino students. In term of course-taking patterns, students who took one course were 13.730 times more likely to matriculate and students who took two courses were 11.132 times more likely to matriculate than were students who took all seven levels of courses.

### **Demographics**

For over 35 years, DMACC Urban Campus has offered noncredit ESL courses to students from all over the world. These students look very different from the overall population demographic of Iowa; 91.3% of the students identified as non-Hispanic Latino/White and the noncredit ESL population consisted of 62.6% who identified as a minority (DMACC, 2014b), thus giving the noncredit ESL programming and DMACC the “opportunity to welcome and celebrate the presence of a new majority” (Rendón & Hope, 1996, p. 470). Hagedorn et al.'s (2007) theory of critical mass informed these results in that the majority of students in this population self-identified as minority students in terms of



race. Although outside the scope of this study, the students' success in this program may have to do with the minority-majority of language diversity of the noncredit ESL program as well as the DMACC Urban campus student body rate of over 42% minority (ethnicity and race) students at the college level.

Noncredit ESL students are more diverse than are GED/HiSET students. In researching GED/HiSET students' matriculation to college, Ryder's (2011) study on this population's trajectories to college in Iowa noted that, in 2003–2004, 28.3% of the state's GED/HiSET students identified as minorities. Also, the ages of students in Ryder's study tended to be younger than the present study's noncredit ESL population, thus demonstrating differences in the two populations. The present study also found that the majority of the noncredit ESL students tended to be females, as was also found in Ryder's study. The majority of the population was in the range of 21 to 30 years of age, which follows the national age trends of this population (CAELA Network, 2010). These age and gender modes also concur with the 2008 study by Spurling et al. on noncredit ESL students at the City College of San Francisco.

### **Course-Taking Patterns**

This research examined the course-taking patterns of students enrolled in noncredit ESL courses. The data indicated that the largest percentage (25.3%) of students started their courses at the Level 3 course level and ended at Level 5 (44.2%). This finding was different from Spurling et al.'s (2008) research in that the majority of students at City College of San Francisco were at the lower levels of instruction. When comparing the students who did matriculate to college-level credit courses with those who did not, a lower percentage of females and Asian/Pacific Islanders tended to matriculate. This could be due to familial

obligations of females and cultural obligations and practices as, for example, students in a collective culture in which educating the self may come below taking care of the family and obligations to others (Leake & Black, 2005). This also could be due to this population's prior educational levels in that they may have already had college experience in their native countries and thus did not need to advance to the community college level.

Spurling et al.'s (2008) research found that the lower the level the student ended his or her noncredit ESL program, the less likely it was that the student would progress through the entire noncredit ESL program and go on to college-level courses. Additionally, that study found that younger students, Asian students, and students who had a high number of instructional hours tended to transition to college-level courses at a higher rate than did the rest of the population. As in Spurling et al.'s study, this study found that ending at a higher course level was a statistically significant predictor of student matriculation. The present study found statistically significant differences with the independent variables of gender, residency status, and ending course level as compared to matriculation. Males tended to matriculate at higher rates than did females, as did citizens and students whose final noncredit ESL course was at a high level. In contrast, females tended to matriculate at lower rates than expected, as did noncitizens and students whose final noncredit course was at the lowest levels. The findings regarding the independent variable of residency status, that students who were citizens matriculated at a higher rate than expected, may reflect that citizens are more likely than are noncitizens or permanent residents to have been in the United States for a longer period of time. Students' residency status may also be indicative of their college-going motivation in that those students who were motivated to gain their residency may be more likely to be motivated to further their education. On the other hand,

noncitizens tending to matriculate at lower rates than expected may be indicative of priorities such as working toward learning English for reasons other than going on in academia, such as to increase job prospects.

In regards to the gender variable, females may tend to matriculate at lower than expected rates due to the lack of a critical mass of females who have taken noncredit ESL classes matriculating to college classes. At DMACC Urban campus, the college-going population tends to be higher in female students in its total population, but the lack of females matriculating from noncredit ESL may be a barrier to this population's matriculation tendencies.

In regards to the variable of total number of course levels completed, students who matriculated completed fewer course levels when compared to students who did not matriculate. Coupled with the findings of the majority of students starting at Level 3 and ending at Level 5, students who matriculate may tend to take fewer courses because of their incoming skills and may not need to start at lower levels. Also, the higher the level that students start their noncredit courses, the fewer courses they have available to take.

The final research question addressed the predictive value of these variables in regards to matriculation. The results of the logistical regression found that citizens are 2.109 times more likely to matriculate than are noncitizens. In terms of population size, these results make sense in that there is a critical mass of citizens in the noncredit ESL population, thus a higher level of comfort may encourage these groups to matriculate. This theory of critical mass could also be applied to the non-Hispanic/Latino students, who were 1.92 times more likely to matriculate than were Hispanic/Latino students.

In terms of course-taking patterns, students who took one course were 13.730 times more likely to matriculate and students who took two courses were 11.132 times more likely to matriculate than students who took all seven levels of courses.

### **Implications for Future Research**

This study marks the first of its kind in researching the area of noncredit ESL population demographics and course-taking patterns in the state of Iowa. This study is limited in scope but opens the door to further research in this previously understudied population. This section discusses the possibilities for further study. As presented in chapter 2, this study contributes to the small body of research focusing on noncredit ESL student course-taking patterns and matriculation rates.

This study was limited in scope to one community college in the state of Iowa and limited to one campus within the district. Further studies could concentrate on statewide or nationwide noncredit ESL populations and use state and U.S. Department of Education data to examine course-taking patterns. Also, this study was restricted to using an existing dataset that offered limited details of students' demographic information and course-taking patterns. Garnering data such as socioeconomic status, prior schooling experiences, and students' goals or reasons for participating in noncredit ESL courses could give valuable insight into this population in terms of their success in matriculating to college. Future studies could also concentrate on locations of noncredit ESL courses and compare the course-taking patterns of students who take noncredit courses in churches or other community locations as opposed to those who take courses on a college campus.

This study uncovered the fact that, clearly, very few students, less than 5%, of the ESL population actually enroll in college courses after taking noncredit ESL courses over the

span of 10 years. These results are not drastically different from those of Spurling et al. (2008) who conducted research at the City College of San Francisco, where 8% of the students represented in that dataset matriculated to college. Reasons for this may vary, but the financial implications of “losing” this population are costly to the community college system. With more noncredit ESL students matriculating to college, a portion of the increase in tuition dollars could be filtered back into noncredit ESL programming to supplement the state and federal funds currently used to support these programs, in turn enabling the college to serve more students and increasing enrollment in college.

A review of the faculty demographics compared to their students’ matriculation rates would provide interesting information that may inform hiring practices in terms of matching faculty demographics with student demographics, possibly contributing to creating a critical mass of minority faculty members as well as students as demonstrated in Hagedorn et al.’s (2007) work. Also, examining the educational level of the faculty may inform policy changes in regards to hiring qualifications of faculty in the noncredit area.

Qualitative studies could also provide valuable insight into DMACC Urban Campus’s noncredit ESL population’s knowledge of college or lack thereof, motivations for enrolling in noncredit ESL courses, perceptions and experiences in these courses, and future goals.

Examining the effects of pilot programs designed to increase the number of noncredit ESL students matriculating to college would provide valuable insights as to the best practices concerning this population. Achieving the Dream colleges across the nation are currently piloting various strategies, such as increased academic advising, student success courses, career pathway/bridge courses, and transition centers, to support this population (Achieving the Dream, n.d.b).

Examining the persistence patterns of noncredit ESL students from term to term in their ESL course sequences and the levels to which they advance would provide valuable information on the success of the program. Moreover, examining the rates of persistence within the noncredit ESL population who matriculate over time as well as what type of courses (developmental education, developmental ESL or college-level courses) and length of time to degree, would give a longitudinal view of the course-taking patterns. Determining the rate of noncredit ESL students who matriculate and go on to attain a postsecondary credential is an area for future research.

This research taps into an area of community colleges where little academic inquiry has been completed. The majority of the academic research on noncredit ESL students falls into qualitative ethnographic, teacher preparation, or language acquisition studies and play an important role in developing the body of literature concerning this population. The lack of empirical data surrounding this population makes requests for increased funding difficult to justify given that the “current political environment . . . prioritizes quantitative data collection and analysis” (Mathews-Aydinli, 2008, p. 211). Thus, this study effectively contributes to the quantitative body of knowledge concerning noncredit ESL students and their journeys in higher education.

### **Implications for Policy and Practice**

The data studied in this research represented the noncredit ESL student demographic information and course-taking patterns. The reasons for a student to enroll in English courses may vary, but when students do not complete their courses, do not enroll in the next level, or discontinue on their educational path, this population’s loss in financial and human capital can be drastic. This section discusses the implication this study revealed in terms of

policy and practice for noncredit ESL programming and community colleges in the state of Iowa.

Being a citizen increases the chances that a student will matriculate to college. Thus, offering residency test preparatory courses free of charge on DMACC Urban Campus may encourage more students to gain their residency, thus possibly increasing the number of students who would matriculate to college courses.

This study's results indicate a need for increased support for the entire noncredit ESL population to matriculate to college, because the population of Black and Asian/Pacific Islander students is relatively high in frequencies when compared to other groups especially at the DMACC Urban Campus. As a college, a focus on recruiting, retaining, and matriculating students of color needs to be a priority, not only to support the ESL population but also to increase the diversity of the college population. A focus on matriculating these populations and graduating these students with a credential supports the national competition agenda. Also, the existence of a critical mass of minority students in the noncredit ESL population creates a sense of comfort, and increasing the numbers of non-Native English speaking minority students who matriculate would contribute to the increasing population of minority students in college-level courses, thus creating a critical mass there as well.

Likewise, the study also revealed significant predictors regarding citizens versus noncitizens. Citizens tend to matriculate at higher levels than expected. Currently, DMACC only tracks if a student is a citizen, a noncitizen, or a permanent resident. Broadening the options of this status to include refugees would give a more accurate picture of the noncredit ESL population and may open the door to possible funding sources such as grants and partnerships with various social services agencies and organizations.

This study has brought to light the fact that recordkeeping over time needs to be standardized and expanded to give future studies truly accurate data for this population. Tracking of proper residency status, past educational experiences, and testing gains would provide future studies the breadth and depth to provide a more broad view of the noncredit ESL population and may help to determine further needed services.

### **Recommendations**

This study found numerous variables that were statistically significant. Many recommendations for improving programming and services to these populations can be put into place. In terms of recruitment, colleges may want to focus their recruiting efforts on students who are Hispanic/Latino, Black, or Asian/Pacific Islander in order to address the lack of these student groups matriculating to college, specifically from the current noncredit ESL population. In addition, a focus on offering citizenship preparation courses concurrently with noncredit ESL classes may give students not only a pathway to citizenship but also possibly a pathway to college.

The structure of the educational system may have a large effect on the matriculation rates of noncredit ESL populations. Offering colinear credit course options to noncredit ESL students (Razfar & Simon, 2011), modelling I-BEST models by incorporating career and technical courses in tandem with noncredit ESL courses (Washington State Board for Community and Technical Colleges, 2015), and incorporating other noncredit paths with noncredit ESL programs could increase the chances that noncredit ESL students will eventually enroll in credit courses, as at the City College of San Francisco (Spurling et al., 2008). Examining the rates of noncredit ESL students who do not have their high school credential could lead to offering GED/HiSET courses together with noncredit ESL along



with noncredit computer skills courses. This could increase rates of college matriculation and allow the students access to federal financial aid once the high school credential was completed. In terms of retention, a concentrated effort to increase the rates of matriculation for students of color in the noncredit ESL program by garnering additional support for minority-majority populations would benefit the college by increasing the overall diversity of the college and assist in the further creation of a critical mass of college-going minority students.

With very little student services support at DMACC Urban Campus apart from the instructors themselves, offering wrap-around services would have an impact on the persistence, retention, and matriculation of this population. These wraparound services could consist of course planning, academic guidance, tutoring, personal counseling, career services, and supplemental services such as childcare or transportation assistance (Purnell & Blank, 2004). Academic advisors, career coaches, and academic navigators are used at the college level to guide students toward the right choices and enlighten students about opportunities in higher education. With very little support of this kind in noncredit ESL programs, one cannot expect students to know their options. Making the financial aid process transparent, streamlining the admissions process, and making college going a goal all could be the responsibilities of professional academic advisors or career coaches to the noncredit ESL program population.

Furthermore, offering “Steps to Credit” workshops similar to the City College of San Francisco several times a semester to inform noncredit students of the steps and opportunities at the college credit level (Spurling et al., 2008) could be a way to start this process. Duplicating Ryder’s (2011) recommendation that additional support be directed toward

students to encourage them to set goals for after completion of the courses and developing a seamless model for students to transition to workforce training or college could be replicated for the noncredit ESL population. Reproducing the College for a Day program, in which noncredit ESL students simulate a typical day as a college student with participation in a college-level course, workshops, guided tours, and student panels, could be a way to reduce students' fear of the unknown (National College Transition Network, 2015). A concentrated effort to hire faculty who have had similar experiences to noncredit students and who "look" like noncredit ESL students could have a significant impact on furthering the critical mass concept (Hagedorn et al., 2007).

To increase persistence, streamlining the length of the noncredit ESL program may be beneficial, as this study found that students who take fewer levels of noncredit ESL coursework tend to matriculate at higher rates than do students who take more levels. As found in developmental education (Bailey, 2009; Crisp & Delgado, 2014) and developmental ESL education (Hodara, 2004; Razfar & Simon, 2006), length of programming has an effect on matriculation; the longer the program, the less likely a student will graduate. This is possibly due to the length of time it takes to go through the process. Streamlining the noncredit ESL course sequence to minimize time to matriculation should be a goal and could be modeled after Bunker Hill Community College's revision and shortening of their math sequences (Achieving the Dream, n.d.a).

Increased financial programming support could also increase the number of students who matriculate. Increasing the number of sections offered to students could expand the number of students served and decrease the number of students turned away from taking

courses each term due to capacity issues. Increasing the overall pool of students in noncredit ESL would, in theory, increase the number of students' matriculating to college courses.

As Kanno and Varghese (2010) recommended, the higher education system needs to expand its view of serving ESL students from strictly remediating students' skills to "a more comprehensive set of educational policies that address their limited social and cultural . . . capitol" (p. 324) and also address structural inequities this population faces in the postsecondary system. The programming needs to address the whole student, not just the lack of English skills.

Since its inception in 1978, the noncredit program at DMACC Urban Campus has operated as a managed enrollment program. In 2013, DMACC Urban Campus began offering concurrent college-level courses to noncredit ESL and GED/HiSET students in the area of career exploration. During the Spring 2014 term, the campus offered college-level computer essentials courses to this population. Studying the cohort of students participating in these courses and tracking their persistence could give valuable information on the success of this program.

With declining enrollments at community colleges in Iowa over the past 4 years (Iowa Department of Education, 2014), it is imperative that colleges retain students in English language programs and recruit them to continue their education at the community college. For example, if DMACC Urban Campus could increase the matriculation rate of their noncredit program students from 5% to 10%, and with all of those students taking just one 3-credit course, the college could bring in almost an additional quarter of a million dollars in tuition dollars over the next 10 years at the current rate of student enrollment. In addition, increasing the number of college enrollees from noncredit programming satisfies

the Department of Education benchmark of matriculation to college, thus garnering more funds for noncredit programming. Based on Spurling et al.'s (2008) research, noncredit ESL students who matriculate tend to gain college credentials at three times the rate of native English-speaking students, thus contributing to a higher overall graduation rate for the college.

With immigration trends in Iowa increasing, the state's workforce is also changing. The workforce also needs to become more educated. Thus, as Spurling et al. (2008) stated:

It is an inescapable conclusion that it is in the national interest for a much larger number of immigrants to attend college. And because a large percentage of today's immigrant population has limited English proficiency, it is in the national interest for far more ESL students, and immigrants with limited English, to make the transition to credit programs at postsecondary institutions. (pp. 115–116)

The present study and its findings underscore Spurling et al.'s statement. The lack of scholarly research on this high-needs population is unfair, not only to the students who benefit from these services but also to the colleges that provide the education. By providing these services, the community colleges are strengthening society as a whole. But to not give support to noncredit ESL students to encourage them to continue to college is a drastic mistake that will be costly in terms of financial and societal gains now and in the future.

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## APPENDIX A. DATA DICTIONARY/CODE BOOK

### Independent Variables:

Student Demographics (All categorical except age is continuous)

#### Gender

F=	0
M=	1
Missing=	2

#### Age (At time of first enrollment)

#

#### Age Group (At time of first enrollment)

Less than 18 =	0
18-20=	1
21-30=	2
31-40=	3
41-50=	4
51-60=	5
61-70=	6
71+=	7

#### Age Group (At time of first enrollment), Combined into 4 groups

Less than 18 =	0
18-20=	0
21-30=	1
31-40=	2
41-50=	3
51-60=	3
61-70=	3
71+=	3

#### Residency

Citizen=	1
Non-Citizen=	2
Perm Resident=	3
Missing=	4

#### Recoded

Citizen=	0
Non-citizen=	1

Ethnicity

Hispanic/Latino=	0
Non- Hispanic/Latino=	1

Race

Black=	0
Alaskan/Native American=	1
Asian/Pacific Islander=	2
White/Non-Hispanic=	3
More than one checked=	4

Beginning (First) Level of Class

BB1=	1
BB2=	2
L1=	3
L2=	4
L3=	5
L4=	6
L5=	7

Beginning (First) Level of Class, grouped

BB1=	1
BB2=	1
L1=	1
L2=	2
L3=	2
L4=	3
L5=	3

Ending (Last) Level of Class

BB1=	1
BB2=	2
L1=	3
L2=	4
L3=	5
L4=	6
L5=	7

Ending (Last) Level of Class, grouped

BB1= 1

BB2= 1

L1= 1

L2= 2

L3= 2

L4= 3

L5= 3

Levels Completed

#

**Dependent Variable:**

Matriculation to college classes

Yes= 1

No= 0

**APPENDIX B. 2014-2015 PROGRAM YEAR DEMOGRAPHICS  
FOR DMACC URBAN CAMPUS**

(From Iowa Department of Education TOPSpro Enterprise)

Under 15	0	0.00
15 - 17	2	0.27
18 - 21	39	5.18
22 - 24	69	9.16
25 - 29	153	20.32
30 - 34	150	19.92
35 - 39	94	12.48
40 - 44	81	10.76
45 - 49	67	8.90
50 - 54	46	6.11
55 - 59	24	3.19
60 - 64	12	1.59
65 - 69	12	1.59
70+	4	0.53
N/A	0	0.00
Male	285	37.85
Female	468	62.15
Hispanic	167	22.18
Not	585	77.69
Hispanic		
N/A	1	0.13
White	244	32.40
Asian	322	42.76
Black	199	26.43
Pacific	2	0.27
Filipino	1	0.13
Indian	1	0.13
Alaskan	0	0.00
N/A	1	0.13