First-Year Direct Entry Student (DES) Attrition
at the
University of Washington Tacoma
*Who Leaves and When*

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Office of Institutional Research
Abstract

This report details finding from a longitudinal study (2006-2012) of attrition patterns found in direct entry, first-year first-time students at the University of Washington Tacoma. Descriptive statistics were developed based on student population attributes that describe members of each of three matriculation outcomes: students exiting the campus in the first year, students exiting the campus in the second year, and students who persist and achieve “Major ready” status. Indices were developed to represent three domains of interest thought to influence each of these outcomes: college preparedness, the student’s social/environmental circumstances, and academic performance while attending the university. These indices and selected student demographic attributes were tested to examine their correlation to matriculation outcomes.

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Executive Summary

In order to better understand the attrition of first year direct entry students (DES), the University of Washington Tacoma took on a longitudinal study of its first years admitting this population - 2006 to 2012 (n=1625). The variables included were identified from the current literature on the topics of retention and attrition in first-year students in higher education. Other variables were developed to represent data points for attributes of interest relevant to specific study research goals for the campus. The objective of the study was to answer the questions, who in this population leave the campus and when does exit occur?

Using the terminology “leaver,” the study investigated exit activity in the first and second year of attendance, and established achieving major-ready status of 90 academic credits as the study’s completion event. The majority of DES students entering directly from high school were female (56.6%). Ethnic distribution reflected a plurality of Caucasian and Asian students (37% and 25% respectively) with underrepresented minorities (URM) making up about 22% of the population. On these and other attributes of interest, entering DES cohort enrollments demonstrated consistent and incremental growth across all markers cohort to cohort. However, a large increase over time occurred in the PELL eligible attribute where a starting 17% of the 2006 cohort increased to 49% with the 2012 cohort.

The distribution of DES demographic attributes in the first and second year leaver population is roughly proportional in size to their numbers in the general population, except for an increased departure count for Caucasians in the year two leaver group. Underrepresented minority (URM) leaver numbers remained a consistent percentage of their DES population overall, with no significantly greater likelihood of leaving than non-URM students.

Exits most frequently occur during summer after the first year, meaning that students complete the academic year, but do not return to campus for a second year of study. Of the DES population, 434 students (27% of the study) did not return after that first summer break.

Within the leaver population, there was some degradation seen in GPA performance when exit GPA is compared to high school entry GPA, however, scholarship status of 78% of exiting students gave no indication of academic issues. Dean’s List students as well as students experiencing some degree of challenge (probation, warnings) were identified.

To better understand this population via the complex roles of “Preparedness,” “Environment,” and “Performance” as contributors to departure, an index of variables representing each domain was created and investigated to determine the statistical significance of these attributes on DES outcomes.

- Performance (GPA, course credits earned, rigor of courses) was shown to be significantly influential in underperformers exiting the campus in both the first and second year (6 times higher in first year, 2.5 times higher in second). Performance also showed strong correlation in students achieving major-ready status.
- Preparedness (high school achievements, AP credit, SAT scores) for college study was not found to be a significant factor in leaving in the first year, but became significant in year two, as better prepared students were three times more likely to depart the campus than their less prepared counterparts.
- Environment (socio-economic state) was also found to be influential, but not as expected. Analysis showed that, in the first year leaver population, students with better environmental conditions were twice as likely to withdraw from campus as those who have less favorable circumstances.
Background

The Tacoma campus of the University of Washington was originally chartered to provide South Puget Sound regional community college graduates a local resource for continued higher education opportunities in upper division and graduate programs. In 2006 however, this mission changed to include students entering as first-year baccalaureate candidates directly from high school, broadening the University of Washington commitment to a complete, four year undergraduate, and graduate, institution.

Recent awareness and acknowledgement of high student attrition numbers in the UW Tacoma campus’ first-time/first year direct entry student (DES) population prompted a desire to better understand the dynamics of attrition found in this lower division student population. The overall intent was to identify who departed from the campus and when. Further, factors that contributed to understanding how to mitigate the loss provided additional incentive for the study.

Attrition Research in Higher Education

Higher education institutions have for some time, understood the immense challenges of providing an instructional environment that promotes student retention. Keeping students enrolled, engaged, and on track is of primary concern, and consumes considerable human and financial resources for the institution. An institution’s economic state and academic reputation can be compromised by low retention numbers.

Attrition, the loss of students, is often addressed as an institutional concern, though retention and attrition at other levels within the institution (college, program, major, class) can portend outcomes for the institution’s overall student exit rate. Thus, administrators often focus on institutional attrition: understanding those students who abandon academic goals at the institution before those aspirations are achieved. This concern is especially true when considering issues for students making the transition from high school to post-secondary studies.

The typology of attrition during the first year shows that first year entry into higher education is a unique academic experience. These students tend to express reasons for departure different than those offered by students later in their academic careers. Moreover, the overall pattern of attrition indicates that the majority of withdrawals occur early in the student’s academic career, declining as matriculation proceeds into later years of attendance, and often showing that leaving occurs at the beginning or end of the academic term (Sexton 1965). Consequently, a focus on intervention strategies applied in the first and second year of studies is thought to be effective practice in stemming early exit. This makes the completion of the first year, transition to the second year and persistence to the third year of studies important milestones in degree attainment.

Most studies and analysis in higher education concerning student degree pursuit emphasize student roles in persistence, and when focusing on student loss, the goal becomes identifying the reasons for withdrawal. The most prominent and influential theories on student departure were posited by Tinto (1975) and Bean (1980) each being focused primarily on the reasons for exit.

Using these foundational concepts, follow-on research on retention in first-year undergraduates tells us much about this population and what factors have been shown to be correlates to matriculation behavior and subsequent attendance/exit outcomes. Included among these is college readiness, as well as societal, situational and nonacademic factors. Studies of attrition often cite the following student attributes as influential elements in student exit; gender, race/ethnicity, precollege academic achievement, educational expectations, family income, socioeconomic status, first-generation status, and institutional fit.
While much is available on the investigation and reporting of retention as an institutional concern, attrition research has been less a focus. Lennin, Beal and Sauer (1980) observed that measurement of attrition behavior is inexact as no clear methodology had been offered as a guide, concluding that the point of attrition studies is primarily focused on identifying correlates. Measurement of attrition, they contend, should be bound to a specific timeframe defined by a completion event, such as degree or certificate attainment.

Motivated to remedy student loss, institutions endeavor to provide a supportive environment for students experiencing the rigors of higher education studies. Marshaling the resources provided by academic and student support services, institutions now implement strategies that directly focus on the first year experience. An awareness of the complex circumstances faced by these students in transition provides the ability to target resources and efforts to optimum effect. Similarly from this perspective, knowledge of who leaves can identify problems within the institution that promote departure, and thus may need adjustment or remediation. This report sought to provide a view of this exiting population and identify possible areas for further study and investigation.

**Contributing Factors in DES Attrition**

When looking at the scholastic progress of students in the DES first-year population, our attrition analysis is focused on the absent student. Tracking attendance behavior patterns reveals when a student leaves the institution. Often, three domains of interest represent student attributes perceived as areas of influence on withdrawal behavior.

- **Preparedness** centers on the student’s inherent academic ability. Did the student, at entry to the university, possess the foundational knowledge necessary to succeed as a degree aspirant?

- **Environment** acknowledges the increased awareness of the supportive or inhibiting influences of socioeconomic circumstances experienced by students and the role that nonacademic factors play in the student’s ability to persist.

- **Academic Performance** examines student grade achievement and course completion to show how well the student is making the transition into college studies. Poor performance is thought to be a direct contributor to departure. This may also provide insight into student adjustment to the institution’s culture and performance expectations.

Being informed about these domains of the student scholastic experience can help gain a more nuanced view of the challenges confronting this population in transition. Institutions seeking to understand student withdrawal behavior must consider that it is the student who, for myriad reasons, makes decisions that promote persistence to degree attainment. Institutional commitment is among these. Institutions confronted with unfavorable retention numbers have leveraged the current findings in the literature to identify indicators of institutional behavior that provide services and resources helpful in strengthening the student/institution bond, thus limiting student exit when preparedness, environment, and performance are not immediate causes of exit from the institution.
Study Scope

The study’s focus is limited to the first nine quarters of DES attendance at the UW Tacoma campus, and evaluates the attendance behavior of these students as they move toward the study’s completion event - “Major-ready” status – often noted as a turning point in retention.

Having insight into why students leave the campus is instrumental to any effort devised to curtail withdrawal. This may require direct questioning of student leavers to tease out prevailing reasons (financial, personal, institutional fit, etc.). This study focused solely on withdrawal patterns and the implications therein. As such, it charts the patterns of attrition and the relationship of certain factors to exit outcomes, but does not claim to directly examine why.

Study Goals and Objectives

The overall goal of the study was twofold; identify the characteristics of students who abandon the campus (who leaves), and the patterns of attendance behavior in the first and second year that identify points of departure (when exit occurs). Meeting these two goals involved a meticulous accounting of matriculation activity from student entry to exit or to major ready status.

The objectives pursued to perform the study were:

1. Create a dataset of student information necessary for generating particulars suitable for analysis
2. Generate a roll call history of DES students by entering cohort as a means to track attendance activity over time
3. Compute population attrition over two academic years of attendance to identify members of exiting student populations in the first and second year of attendance
4. Create indices to represent domains of interest for population significance analysis.

Study Design

UW Tacoma’s academic programs determine requirements for degree pursuit by establishing goals to be accomplished to progress to eventual degree. Accordingly, students attempt to meet these incremental goals as inherent requirements for advancement.

Seeking admission into a major course of study is a primary goal of the degree seeking student. As new students to the campus, the focus of coursework encountered in the first and second year is the acquisition of academic credits accomplished via successful academic performance. Without the necessary credit accumulation, entry into a chosen major is hindered. Additionally, Aldman (1999) observed that students accruing less than full time credit status in the first year significantly reduce their chance for degree fulfillment, making credit accrual an important metric for assessing progress to degree. Thus, this study established as its study completion event, achieving “major-ready” status (the accrual of 90 academic credits). This threshold can be accomplished by the beginning of the third year of institutional attendance for those attending as “traditional” students, that is, they are within the customary age group for direct from high school entrants and attempt a full academic credit load of 15 credits per quarter. Attendance in summer is not considered, as the traditional undergraduate attendance pattern for the quarter system is fall, winter, and spring.
The scope of the investigation encompasses the first two years of UW Tacoma attendance. The University of Washington uses a quarterly academic year system that spans two calendar years. In university data systems, each quarter is assigned a number:

\[
\text{Summer} = 3, \quad \text{Autumn} = 4, \quad \text{Winter} = 1, \quad \text{Spring} = 2
\]

For the majority of colleges and programs within the university, autumn quarter (Q4) is the typical starting quarter for new direct entry students. To chart attendance over the time frame of this investigation (entering year and second year), the academic year and current quarter were paired, where Y=year and Q=quarter. Thus Y2Q2 is spring quarter of the second academic year. Using this method of delineating time increments allowed tracking of each individual student quarter to quarter, year to year, capturing the attendance and withdrawal activity occurring during this period. Consequently, the progress to major-ready status includes an examination of student persistence to first year completion, the successful transition to the second year, the completion of the second year, and return to campus for their third year of studies. As a result, three outcome states were derived from the goal to attain major-ready status;

1. Failure to matriculate to the third year (withdrawal from campus)
2. Matriculation to the third year with 90 credits, and
3. Arrival at the third year with less than 90 credits.

A roll call of attendance for each student in the study population was performed, quarter to quarter, over the nine study quarters, ending at the third autumn anniversary census day count. Students identified as either registered or absent that quarter were identified. This accounting was used to identify attendance patterns that revealed points of departure within and across cohorts. This allowed tracking of the student’s progress to study milestones.

The study uses the term “leaver” to denote students who have been absent from the campus at least two consecutive non-Summer quarters or three consecutive quarters, if Summer is included. As this study does not consider issues such as “time to degree,” (a concern of traditional retention studies that exceeds the purpose of this investigation), a direct and simple identifier of withdrawal point allows a detailed look at attendance behavior required if “dropout” and stop out activity is considered. In context to the timeframe of this study, “Leaver” assumes an absence from the campus that requires submission of a new application to return (two consecutive quarters) is an intentional or default withdrawal from the campus by the student.

Data available in the university's Enterprise Data Warehouse (EDW) were sourced to build the study’s dataset. Further, computed study variables were created to provide measures for aspects of the student experience and condition that affect student attrition not available in enterprise data stores. These variables, specific to the study, were created to denote independent variables (IV) to serve as study predictors, and dependent variables (DV) that represented matriculation outcome states. The independent and dependent variables selected for the study allowed discrete review of each attribute as well as their development of indices designed to represent factors within one of three domains explored; \textit{preparedness, environment, performance}. 
Findings

DES Entrants

1. For the years spanning 2006 to 2012, autumn census day tallies of direct entry students (DES) cohorts show that 1625 first-time first-year students entered the campus directly from high school.

2. Enrollment of DES students increased incrementally over the study period. The 2012 cohort showed a considerable upsurge over previous years. It continues to grow in present years, with the 2015 Cohort at 459 DES students (University of Washington, 2015).

![Graph showing enrollment trends from 2006 to 2012]

3. The combined cohort totals for race/ethnicity of the DES population was as follows:

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>129</td>
<td>7.9</td>
</tr>
<tr>
<td>American Indian</td>
<td>33</td>
<td>2.0</td>
</tr>
<tr>
<td>Asian</td>
<td>410</td>
<td>25.2</td>
</tr>
<tr>
<td>Caucasian</td>
<td>597</td>
<td>36.7</td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
<td>36</td>
<td>2.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>164</td>
<td>10.1</td>
</tr>
<tr>
<td>International</td>
<td>11</td>
<td>0.7</td>
</tr>
<tr>
<td>Not Indicated</td>
<td>245</td>
<td>15.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1625</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4. 96.9% of DES entrants were 19 or younger with about 77% of these being 18 YOA. The remaining 3% were 20 to 28 YOA.

5. Females represented 56% (n=904) of the DES population.

6. A little over 60% (n=977) of DES entrants were South Sound residents: residents of Pierce, Thurston, Lewis, and Mason counties.

7. The top five high schools (feeder institutions) represented in the DES population were:

<table>
<thead>
<tr>
<th>High School City</th>
<th>Institution Avg. GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curtis Senior High School</td>
<td>University Place</td>
</tr>
<tr>
<td>Todd Beamer High School</td>
<td>Federal Way</td>
</tr>
<tr>
<td>Puyallup Senior High School</td>
<td>Puyallup</td>
</tr>
<tr>
<td>Mount Tahoma Senior High School</td>
<td>Tacoma</td>
</tr>
<tr>
<td>Emerald Ridge High School</td>
<td>South Hill</td>
</tr>
</tbody>
</table>

8. The minimum entering DES High School GPA was 2.01 while eleven students entered with a 4.0 GPA. The average GPA across all DES entrants was 3.25.

9. About 35% (556) of DES entered as PELL eligible candidates.
10. Of the initial 1625 DES population, 1485 (91.4%) provided information on the educational level of their guardians. Of this group, 60% were first generation college students: 28.5% of the guardians have no college experience, 31.6% had some college experience. Only 40% identified as having parents or guardians with a college degree.

11. Some DES had precollege exposure while in high school. 3.5% of females and 2.1% of males participated in College in High School (CIHS). However the larger exposure to college was in participation in the early summer Running Start, where 154 (9.5%) females and 117 (7.2%) males took part.

12. Advance Placement Credits are another pre-college activity and .3% of the DES females and 4.4% of males participated.

13. DES combined SAT scores of 1488 were within the national average of 1500, though male scores exceeded those of females (1523 vs. 1461).

14. 347 (21.4%) DES indicated an interest in a STEM program of study, 247 (15.2%) were male and 48 (3%) of these were underrepresented minorities (URM). Of the 100 (6.2%) females interested in STEM studies, 18 (1.1%) were URM.
Entering DES Cohort Populations by Attribute

All Direct Entry Students (DES) (n=1625)

- Female: 56%
- Male: 44%
- African American: 8%
- American Indian: 2%
- Asian: 25%
- Caucasian: 37%
- Hawaiian / Pacific Islander: 2%
- Hispanic: 10%
- International: 1%
- Race Not Indicated: 15%
- Underrepresented Minority: 22%
- Feeder High School Student: 32%
- PELL Eligible: 34%
- South Sound Resident: 60%

2006 Cohort (n=189)

- Female: 58%
- Male: 42%
- African American: 12%
- American Indian: 2%
- Asian: 25%
- Caucasian: 37%
- Hawaiian / Pacific Islander: 2%
- Hispanic: 6%
- International: 0%
- Race Not Indicated: 17%
- Underrepresented Minority: 25%
- Feeder High School Student: 17%
- PELL Eligible: 17%
- South Sound Resident: 63%

2007 Cohort (n=197)

- Female: 54%
- Male: 46%
- African American: 6%
- American Indian: 0%
- Asian: 30%
- Caucasian: 41%
- Hawaiian / Pacific Islander: 2%
- Hispanic: 10%
- International: 0%
- Race Not Indicated: 11%
- Underrepresented Minority: 18%
- Feeder High School Student: 35%
- PELL Eligible: 27%
- South Sound Resident: 58%

2008 Cohort (n=219)

- Female: 55%
- Male: 45%
- African American: 6%
- American Indian: 2%
- Asian: 21%
- Caucasian: 43%
- Hawaiian / Pacific Islander: 1%
- Hispanic: 10%
- International: 0%
- Race Not Indicated: 14%
- Underrepresented Minority: 22%
- Feeder High School Student: 30%
- PELL Eligible: 26%
- South Sound Resident: 62%

2009 Cohort (n=197)

- Female: 55%
- Male: 45%
- African American: 7%
- American Indian: 2%
- Asian: 23%
- Caucasian: 42%
- Hawaiian / Pacific Islander: 2%
- Hispanic: 11%
- International: 0%
- Race Not Indicated: 13%
- Underrepresented Minority: 22%
- Feeder High School Student: 39%
- PELL Eligible: 31%
- South Sound Resident: 60%

2010 Cohort (n=221)

- Female: 56%
- Male: 44%
- African American: 8%
- American Indian: 5%
- Asian: 20%
- Caucasian: 45%
- Hawaiian / Pacific Islander: 3%
- Hispanic: 11%
- International: 0%
- Race Not Indicated: 7%
- Underrepresented Minority: 28%
- Feeder High School Student: 34%
- PELL Eligible: 33%
- South Sound Resident: 62%

2011 Cohort (n=252)

- Female: 59%
- Male: 41%
- African American: 0%
- American Indian: 2%
- Asian: 30%
- Caucasian: 38%
- Hawaiian / Pacific Islander: 2%
- Hispanic: 11%
- International: 0%
- Race Not Indicated: 8%
- Underrepresented Minority: 23%
- Feeder High School Student: 33%
- PELL Eligible: 46%
- South Sound Resident: 62%

2012 Cohort (n=338)

- Female: 54%
- Male: 46%
- African American: 6%
- American Indian: 2%
- Asian: 26%
- Caucasian: 26%
- Hawaiian / Pacific Islander: 3%
- Hispanic: 11%
- International: 3%
- Race Not Indicated: 29%
- Underrepresented Minority: 22%
- Feeder High School Student: 30%
- PELL Eligible: 49%
- South Sound Resident: 56%
When Exit Occurs

For the study, the quarter of student exit was defined as the first quarter of the leaver condition, that is, the first of three consecutive quarters of absence from census day roll call. As illustrated below, most leavers (first and second year) appear to make the decision to stop degree pursuit at UW Tacoma at the end of an academic year of study as evidenced by the tally of summer quarter leavers (374/51%).

15. Autumn quarter (Q4) is the typical starting quarter for DES. Winter quarter (Q1) represents the following quarter of attendance, then Spring quarter (Q2), Summer quarter (Q3), etc. As shown below, the quarter most likely to initiate a leaver’s departure is Summer quarter (Q3).

<table>
<thead>
<tr>
<th>Quarter</th>
<th>1st Year Leavers</th>
<th>2nd Year Leavers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>99</td>
<td>94</td>
<td>193</td>
</tr>
<tr>
<td>Spring</td>
<td>93</td>
<td>52</td>
<td>145</td>
</tr>
<tr>
<td>Summer</td>
<td>234</td>
<td>140</td>
<td>374</td>
</tr>
<tr>
<td>Autumn</td>
<td>8</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>434</strong></td>
<td><strong>304</strong></td>
<td><strong>738</strong></td>
</tr>
</tbody>
</table>

16. Evidence from a tally of attendance roll call accounting shows the pattern of exit is relatively consistent cohort to cohort over the first and second year of attendance.

<table>
<thead>
<tr>
<th>Cohort</th>
<th>2006 Cohort</th>
<th>2007 Cohort</th>
<th>2008 Cohort</th>
<th>2009 Cohort</th>
<th>2010 Cohort</th>
<th>2011 Cohort</th>
<th>2012 Cohort</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>13</td>
<td>11</td>
<td>12</td>
<td>15</td>
<td>8</td>
<td>14</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Spring</td>
<td>19</td>
<td>6</td>
<td>12</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Summer</td>
<td>32</td>
<td>12</td>
<td>34</td>
<td>16</td>
<td>39</td>
<td>30</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Autumn</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64</strong></td>
<td><strong>29</strong></td>
<td><strong>60</strong></td>
<td><strong>40</strong></td>
<td><strong>57</strong></td>
<td><strong>50</strong></td>
<td><strong>52</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>

17. Attrition among DES cohorts indicates the 2010 cohort experienced the fewest leavers relative to the initial entry population:

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Entering Population</th>
<th>1st Year Leavers</th>
<th>2nd Year Leavers</th>
<th>Total Leavers</th>
<th>Total Leavers % of Entrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Cohort</td>
<td>189</td>
<td>64</td>
<td>29</td>
<td>93</td>
<td>49.2%</td>
</tr>
<tr>
<td>2007 Cohort</td>
<td>197</td>
<td>60</td>
<td>40</td>
<td>100</td>
<td>50.8%</td>
</tr>
<tr>
<td>2008 Cohort</td>
<td>219</td>
<td>57</td>
<td>50</td>
<td>107</td>
<td>48.9%</td>
</tr>
<tr>
<td>2009 Cohort</td>
<td>209</td>
<td>52</td>
<td>43</td>
<td>95</td>
<td>45.5%</td>
</tr>
<tr>
<td>2010 Cohort</td>
<td>221</td>
<td>52</td>
<td>35</td>
<td>87</td>
<td>39.4%</td>
</tr>
<tr>
<td>2011 Cohort</td>
<td>252</td>
<td>72</td>
<td>40</td>
<td>112</td>
<td>44.4%</td>
</tr>
<tr>
<td>2012 Cohort</td>
<td>338</td>
<td>77</td>
<td>67</td>
<td>144</td>
<td>42.6%</td>
</tr>
</tbody>
</table>
Who Leaves

**DES First Year Leavers**

1. In the first year of their attendance, 434 or 26.7% of the total entering DES population exited the campus prior to their first anniversary year and quarter (Y2Q4)

2. The attrition of DES leaving in the first year had held to ~25% after the first few high loss years. Of the initial entering DES cohort (2006), 34% left the campus before Y2Q4 while about 23% of the 2012 cohort did so. More recent years confirm this trend (University of Washington, 2015).

3. The following illustrates the distribution of first year leavers by attribute.

4. Average GPA scores for first year leavers show males to be underperforming when compared to their average High School GPA at entry (1.87 vs. 3.08), while females perform somewhat better on the same measure (2.21 vs. 3.14). This reduction in GPA performance of first year leavers held true across all ethnicities.

5. Nearly 24% (95) of DES first year leavers, for whom parent educational information was available (387), would have been the first in their family to attend college (First Generation.)

6. Of the first year leavers where there was an evaluation of family income (425), 16.5% (70) were indicated as having a low family income. These students left in the first year with an average first year GPA of 1.82.
7. DES exits were mostly by those with requested majors in IAS and Business (80%). However, of this group, while 20% may have been on academic warning, 56% left without current academic warnings and 6.4% were on the Dean’s list.

8. When available data on the status of student academic success for all DES is reviewed, we find about 22% are in some academic distress. However, six percent of first year DES leavers are Dean’s list students. The majority of student leavers simply fail to return after summer break, although a number of students with warnings leave the campus after only one quarter of classes.

<table>
<thead>
<tr>
<th>Scholarship Status</th>
<th>Number of Quarters Attending Before Exit</th>
<th>Total</th>
<th>% of FY Leavers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 (Y1Q1)</td>
<td>2 (Y1Q2)</td>
<td>3 (Y1Q3)</td>
</tr>
<tr>
<td>Dean’s List</td>
<td>4</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Drop</td>
<td>0</td>
<td>0</td>
<td>67</td>
</tr>
<tr>
<td>Warning</td>
<td>32</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Probation</td>
<td>2</td>
<td>35</td>
<td>22</td>
</tr>
<tr>
<td>Reinstated</td>
<td>0</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>None</td>
<td>61</td>
<td>58</td>
<td>110</td>
</tr>
</tbody>
</table>

9. Dean’s list leavers are predominately female (19 of 26) and report an average GPA of 3.6. By contrast, of those listed on probation, 38 of 59 (65%) were male, averaging a 1.23 GPA.
DES Second Year Leavers

1. Of the 1191 (73%) students returning to the campus to begin their second year of attendance (Y2Q4), 26.7% of the total returning DES population exited the campus prior to their third anniversary year and quarter (Y3Q4).

2. The population of second year leavers follows the general distribution of the DES first year population in that, as a percentage of those who leave the campus, students leave at rates that do not exceed their overall proportional membership in the total DES population.

3. As reported in the first year leaver population, DES second year exits when grouped by their entering requested major has the majority (57%) from IAS followed by Business (22%). However, the grade performance of these students was higher than the previous first year leavers with an average second year GPA of 2.7.

4. Again, while 21% of second year leavers were determined to have a dilatory scholarship status, 16% were on the Dean’s list. The majority of second year leavers exit the campus in the Summer Quarter.

5. One hundred students who were PELL recipients left the campus in their second year, 15 of these were on the Dean’s list having an average total award offered amount of $13,600. Fifty-three of the one hundred had no scholarship determination but had received an average total award offered amount of $14,300 and had achieved an average 2.9 GPA.
Matriculation Outcomes

All DES (n=1625)

- First Year Leaver: 434/27%
- Second Year Leaver: 304/19%
- Major Ready (Y3Q4): 714/46%
- UW Tacoma Graduated: 709/44%

2006 Cohort (n=189)

- First Year Leaver: 64/34%
- Second Year Leaver: 49/15%
- Major Ready (Y3Q4): 74/39%
- UW Tacoma Graduated: 93/49%

2007 Cohort (n=197)

- First Year Leaver: 60/30%
- Second Year Leaver: 40/10%
- Major Ready (Y3Q4): 78/40%
- UW Tacoma Graduated: 96/49%

2008 Cohort (n=219)

- First Year Leaver: 57/25%
- Second Year Leaver: 50/23%
- Major Ready (Y3Q4): 83/38%
- UW Tacoma Graduated: 120/55%

2009 Cohort (n=197)

- First Year Leaver: 52/25%
- Second Year Leaver: 43/21%
- Major Ready (Y3Q4): 103/49%
- UW Tacoma Graduated: 132/63%

2010 Cohort (n=221)

- First Year Leaver: 52/24%
- Second Year Leaver: 35/16%
- Major Ready (Y3Q4): 116/52%
- UW Tacoma Graduated: 127/57%

2011 Cohort (n=252)

- First Year Leaver: 71/29%
- Second Year Leaver: 40/16%
- Major Ready (Y3Q4): 119/47%
- UW Tacoma Graduated: 100/40%

2012 Cohort (n=338)

- First Year Leaver: 77/23%
- Second Year Leaver: 67/20%
- Major Ready (Y3Q4): 171/51%
- UW Tacoma Graduated: 41/12%
Analysis of Findings

The study sought to identify factors in the UW Tacoma DES population having significant association/correlation to study matriculation outcome events, namely withdrawal from campus (leaver) and credit accrual to “major-ready” status. Targeted attributes in the data identified in the literature as possible contributors to matriculation outcomes were selected as predictor variables, and the chi-squared test of independence was performed to test which of these variables demonstrated significant association with each outcome state. Using the “null hypothesis,” the test examined if observed relationships in the study sample occurred by chance alone, or evidenced a statistically significant relationship to a study outcome.

<table>
<thead>
<tr>
<th>DES Attribute (Predictor Variables)</th>
<th>First Year Leaver</th>
<th>Second Year Leaver</th>
<th>Major Ready Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig.</td>
<td>ES</td>
<td>Sig.</td>
</tr>
<tr>
<td>Cohort Membership</td>
<td>.088</td>
<td>.082</td>
<td>.111</td>
</tr>
<tr>
<td>Gender</td>
<td>.036</td>
<td>.052</td>
<td>.084</td>
</tr>
<tr>
<td>URM Status</td>
<td>.821</td>
<td>.006</td>
<td>.695</td>
</tr>
<tr>
<td>Low Family Income (LFI)</td>
<td>.011</td>
<td>.064</td>
<td>.026</td>
</tr>
<tr>
<td>Feeder Institution</td>
<td>.147</td>
<td>.049</td>
<td>.259</td>
</tr>
<tr>
<td>Entry Advance Placement (AP) Credits</td>
<td>.107</td>
<td>.040</td>
<td>.024</td>
</tr>
<tr>
<td>STEM Requested Major</td>
<td>.032</td>
<td>.053</td>
<td>.035</td>
</tr>
</tbody>
</table>

Seven variables suggested in the literature were identified as attributes of interest. As detailed in the above table, significance to a study outcome was found in five attributes; cohort membership, gender, low family income, advanced placement participation in high school, and STEM major intent.

In the first year leaver population, gender \( p=.036 \), LFI \( p=.011 \), and STEM intended major \( p=.032 \) were to varying degrees related to early exit from the campus. Male students exceeded exceptions for exits in gender. More LFI and non LFI students remained on campus than expected in the first year.

Association with leaver activity remained true for second year exits for STEM and LFI students, though not gender. However, for the second year, more non LFI students exited the campus than projected. Advanced Placement (AP) credits become a factor in the leaver population of second year exits.

As for arriving major-ready in the third year, cohort membership \( p=.004 \), gender \( p=.023 \) have association with this outcome, as does AP credit at entry \( p=.011 \). Over the range of cohort populations, expectations for meeting this status were not met in the early cohorts, but achieved for those in the later years of entry (2009 and later). In gender, females exceeded expectations for achieving this status than their male counterparts.

Interestingly, URM status in and of itself, appears unrelated to an outcome, suggesting this attribute is not a predominate factor in determining matriculation results. A similar interpretation can be made of DES attendance at a high school feeder institution on influence in reaching major-ready status.

It should be noted that, while some predictor variables show significance, the strength of their association to a given outcome is rather small, as the maximum effect size (ES) was found to be .146 on an evaluative scale of 0 to 1.0. Thus, though a relationship was observed occurring not by chance, the practical importance of the relationship is tenuous.
As aforementioned, discussion of contributing factors in departure can be represented in three domains of interest, preparedness, environment, and academic performance. By selecting and preparing (scaling, log adjustment, directionality etc.) of included attributes, a variable representing an index of each domain was created by totaling the values for each variable as indicated below:

**Preparedness Index** (IndexPREP_Tiers)
- $\text{APcredit} + \text{scale_mp_new} + \text{scale_avg_gpa_for_school} + \text{hs_def\_english\_2} + \text{hs\_def\_math\_2} + \text{hs\_def\_science\_2} + \text{scale\_sat\_m} + \text{scale\_sat\_v} + \text{scale\_sat\_w} + \text{scale\_student\_gpa}$

**Environmental Index** (IndexENV)
- $\text{StartPELLElig2} + \text{low\_family\_income\_2} + \text{hs\_free\_lunch\_pct\_2} + \text{scale\_guardian\_ed\_level} + \text{scale\_log10\_guardian\_gross\_income} + \text{Pell2}$

**Performance Index** (IndexPERFORM)
- $\text{attendance\_initial\_desc\_2} + \text{qtr\_gone\_scholarship\_2} + \text{gpa\_qtr\_gone\_scale} + \text{Req\_Major\_High\_Demand\_2} + \text{Req\_Major\_STEM\_2} + \text{qtr\_gone\_total\_credits\_2}$

The values were bifurcated at the median to create a two-tier representation of index values; lowest to median = 0 (tier 1) and the remaining values to highest = 1 (tier 2).

Chi Squared was used to test each index. The study sample data was tested to discover if tier 1 and tier 2 values contained in each index evidenced a statically significant association with a study matriculation outcome as follows:

<table>
<thead>
<tr>
<th>DES Index Attribute (Predictor Variables)</th>
<th>First year Leaver</th>
<th>Second Year Leaver</th>
<th>Major Ready Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig.</td>
<td>ES</td>
<td>Sig.</td>
</tr>
<tr>
<td>Preparedness Index</td>
<td>.045</td>
<td>.050</td>
<td>.000</td>
</tr>
<tr>
<td>Environment Index</td>
<td>.003</td>
<td>.074</td>
<td>.006</td>
</tr>
<tr>
<td>Performance Index</td>
<td>.000</td>
<td>.352</td>
<td>.000</td>
</tr>
</tbody>
</table>

With a Preparedness index significance of .045 and .000, an association was demonstrated with leaver activity in the first and second year. The same state held true for the Environmental condition (.003 and .006), as well as Performance (.000 in both first and second year student exits). This shows all three indices’ were in some way associated with leaver activity in the first and second year. However, as found in single variable testing, the effect size of this relationship was weak save for Performance where the relative strength of the relationship shown in effect size was moderately stronger. Additionally, it appears that only Performance has correlation with Major-Ready status, suggesting that achieving this milestone is related to aspects of academic performance as one might expect, and that this relationship is moderately strong (ES = .435) compared to the other indices.

To determine the level and direction of influence of these indexed domains on the study matriculation outcomes of interest, logistic regression was applied. Logistic regression is well-suited to the analysis of dichotomous outcome variables such as these matriculation outcomes (where 1 denotes the condition of interest and 0 denotes its negation) and allows for the simultaneous evaluation of the impact of multiple predictor variables on the outcome. Unlike simple linear regression, which is poorly suited to the analysis of binary outcome data, logistic regression estimates the factor by which the odds of the outcome change in response to changes in the predictor variables. Logistic regression offers an odds ratio calculation to assign association of a predictor to a targeted outcome.

Thus, the logistic regression model was fitted to the matriculation outcome data to evaluate whether and to what degree each index contributed to each study outcome. Results of this analysis confirm a statistically significant influence of indices on study outcome states, and provide additional insight into the nature of these effects.

Each outcome was evaluated separately as follows:
### Leaver First Year

<table>
<thead>
<tr>
<th>Step 1&lt;sup&gt;a&lt;/sup&gt;</th>
<th>IndexENV_Tiers</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>.645</td>
<td>.211</td>
<td>9.331</td>
<td>1</td>
<td>.002</td>
<td>1.905</td>
</tr>
<tr>
<td></td>
<td>IndexPERFORM_Tiers</td>
<td>-.782</td>
<td>.133</td>
<td>178.537</td>
<td>1</td>
<td>.000</td>
<td>.168</td>
</tr>
<tr>
<td></td>
<td>IndexPREP_Tiers</td>
<td>.493</td>
<td>.289</td>
<td>2.902</td>
<td>1</td>
<td>.088</td>
<td>1.637</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td>-.359</td>
<td>.337</td>
<td>16.232</td>
<td>1</td>
<td>.000</td>
<td>.257</td>
</tr>
</tbody>
</table>

<sup>a</sup> Variable(s) entered on step 1: IndexENV_Tiers, IndexPERFORM_Tiers, IndexPREP_Tiers.

Departure from the campus in the first year is significantly associated with two study indices, Environment and Performance. The Exp(B) coefficient of estimated 1.905 for Environment indicates that the odds of leaving the campus for students with more favorable environmental conditions (tier 2) is nearly twice that of students who have less favorable circumstances (tier 1). On the other hand, the odds of a low-performing student’s departure (tier 1 of the Performance index) are 5.95 times greater than those of higher academic performers (tier 2).

### Leaver Second Year

<table>
<thead>
<tr>
<th>Step 1&lt;sup&gt;a&lt;/sup&gt;</th>
<th>IndexENV_Tiers</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>-.195</td>
<td>.212</td>
<td>.848</td>
<td>1</td>
<td>.357</td>
<td>1.216</td>
</tr>
<tr>
<td></td>
<td>IndexPERFORM_Tiers</td>
<td>-.927</td>
<td>.136</td>
<td>46.116</td>
<td>1</td>
<td>.000</td>
<td>.396</td>
</tr>
<tr>
<td></td>
<td>IndexPREP_Tiers</td>
<td>1.187</td>
<td>.384</td>
<td>9.551</td>
<td>1</td>
<td>.002</td>
<td>3.276</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td>-.862</td>
<td>.417</td>
<td>19.895</td>
<td>1</td>
<td>.000</td>
<td>.155</td>
</tr>
</tbody>
</table>

<sup>a</sup> Variable(s) entered on step 1: IndexENV_Tiers, IndexPERFORM_Tiers, IndexPREP_Tiers.

For those students who persist beyond their first year, performance continues to be a statistically significant predictor of second-year withdrawal, indicating that the odds of departure for underperforming students is about 2.5 times higher than their better performing counterparts (1/Exp(B)=1/0.396). Curiously, while being better prepared for college at entry does not register as a significant factor in first-year attrition, it does appear to influence the odds of second-year exits, with more highly prepared entrants being 3.3 times more likely to depart than less prepared students.

### Major-ready

<table>
<thead>
<tr>
<th>Step 1&lt;sup&gt;a&lt;/sup&gt;</th>
<th>IndexENV_Tiers</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>-.293</td>
<td>.306</td>
<td>.916</td>
<td>1</td>
<td>.338</td>
<td>.746</td>
</tr>
<tr>
<td></td>
<td>IndexPERFORM_Tiers</td>
<td>2.569</td>
<td>.230</td>
<td>124.290</td>
<td>1</td>
<td>.000</td>
<td>13.052</td>
</tr>
<tr>
<td></td>
<td>IndexPREP_Tiers</td>
<td>-.208</td>
<td>.375</td>
<td>.306</td>
<td>1</td>
<td>.580</td>
<td>.813</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td>.913</td>
<td>.438</td>
<td>4.342</td>
<td>1</td>
<td>.037</td>
<td>2.492</td>
</tr>
</tbody>
</table>

<sup>a</sup> Variable(s) entered on step 1: IndexENV_Tiers, IndexPERFORM_Tiers, IndexPREP_Tiers.

Finally, this analysis indicates that a student’s ability to acquire the requisite 90 academic credits for entrance into a major of choice (conditional on completion of their first and second year of attendance) is influenced by only one factor, Performance. The odds that a high performing student will achieve major-ready status are 13.052 times those of low performers.

Students represented in the DES sample population demonstrate that academic performance is the single most consistently important predictor of persistence and retention leading to major-ready status, as statistical significance is indicated for this index in all three outcome conditions (\(p=.000\)). The odds that high performers will overcome the challenges standing between them and each matriculation benchmark are greatly improved relative to their low-performing peers. This suggests that intervention on scholastic performance for students in the tier 1 Performance condition is the key to stemming overall attrition in the DES population.
UW Tacoma’s academic and administrative policy and procedures determine requirements and expectations for degree pursuit, establishing a set of goals to be accomplished for advancement to eventual degree. Together with a review of student responses to various questions contained in the UW Tacoma “freshman survey,” a set of assumptions regarding the population’s academic intent and goals were established.

1. Direct entry FTFY students enter with an intention to persist to a four year degree
2. Though a small percent entertain the possible intent to transfer to the UW Seattle campus, most seek a degree offered via a UW Tacoma program major
3. The considerable majority of first-year students initially enter the university in the autumn quarter of the academic year, establishing Autumn as an “anniversary date”
4. These students are considered “traditional” in that they are within the customary age group and attempt a full academic credit load of 15 credits per quarter. Attendance in summer is not standard, as the traditional undergraduate attendance pattern for the quarter system is Fall, Winter, and Spring
5. Taking a “full” credit load of 15 results in 45 credits being accrued per academic year as follows:

<table>
<thead>
<tr>
<th></th>
<th>Y1Q4 Entry</th>
<th>Y1Q1</th>
<th>Y1Q2</th>
<th>Y2Q4 1st Aniv.</th>
<th>Y2Q1</th>
<th>Y2Q2</th>
<th>Y3Q4 2nd Aniv.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Credits</td>
<td>0</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>Quarter Credits</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Total Credits Accrued</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

In conceptualizing the research task and required resources to conduct the study, agreement on key terms and definitions were necessary.

1. **Leaver**: The study uses the term “leaver” to denote students who have been absent from the campus at least three consecutive quarters (sans summer quarter). As this study does not consider issues such as “time to degree,” (a concern of retention studies that exceed the purpose and scope of this investigation), this direct and simple identifier of the absent student allows a less detailed look at attendance behavior required if “dropout” and Stop out” activity is considered. In context to the timeframe of this study, “Leaver” assumes that an absence from the campus that requires submission of a new application (two consecutive quarters) is an intentional or default withdrawal from the campus by the student.

2. **Year/Quarter (Y/Q)**: The University of Washington uses a quarterly academic year system that spans two calendar years. In university data systems, each quarter is assigned a number as follows; autumn = 4, winter = 1, spring = 2, summer = 3. For the majority of colleges and programs within the university, autumn quarter (Q4) begins the academic year. To chart attendance over the time frame of this investigation (entering and second year), the academic year and current quarter were paired, where Y=year and Q=quarter. Thus Y2Q2 is spring quarter of the second academic year.
3. **Cohort:** Students were assigned to cohorts based on their entry year. Entry-year, paired with a quarter designation (Y1Q1), established the cohort identity and determined how attendance would be tallied (quarterly census day present/absent status). This standardized matriculation accounting and allowed analysis by time segments across cohorts.

4. **DES:** This substitutes for “Direct Entry, First-time, first-year student.” These students enter the university directly from high school with no previous attendance at a two or four year higher education institution. However, college credits may have been gained through participation in programs designed to provide college experience prior to actual college admission.

5. **Major Ready:** Students must accumulate a minimum total of course credits before they are eligible to apply for entry into their preferred field of study from which they hope to receive a degree. Ninety credits are accumulation by a full-time student (45 credits per academic year). Typically this is achieved by the beginning of their junior year (Y3Q4).

6. **South Sound:** A definition of south sound is elusive as it includes political, economic, sociological and geographical considerations that influence boundaries. For purposed of this report, concerned primarily with identifying student residency, an area surrounding UW Tacoma, including the counties of Pierce, Thurston, Lewis, and Mason, was used to define the geographical areas identified as included in our definition.
References