**Methods**

**Sample**

The sample consisted of 21,538 students who attended James Madison University (JMU) between Spring 2017 and Fall 2022. Racial identity, gender identity, first generation status, state residency, and federal grant status distributions are shown in Table 1. Social identities that had categories that were too small (<5% of the total sample) were left out of analysis to protect their experiences. Rather, we look to research and stories of those students directly to infer about retention at JMU. This includes (but is not limited to) Indigenous, Pacific Islander, and trans and nonbinary students. Results were controlled with the addition of a variable denoting whether the semester a student left is a semester where COVID was occurring.

**Analysis**

Logistic regression was used to predict a student’s likelihood of leaving the university at the end of the first year of study. Predictors in the model included racial identity (African American/Black, Asian/Asian American, Hispanic/Latinx, Multiracial, and White), gender identity (male or female), generation status (continuing- or first-generation), state residency (in-state or out-of-state), and grant status (awarded a federal grant or not awarded a federal grant). Interactions were also put into the model to explain experiences of students who are intersectionally marginalized within higher education contexts (e.g., race and generation status,

**Results**

**Descriptive**

Frequencies of retention by social identities are outlined in Table 2. The overall retention rate of the sample is 94%. All racial identities included in the study have a retention rate of 94%, with only Asian students having a lower retention rate of 93%. The same can be said of gender identity; both female and male students have a 94% retention rate after the first year. First generation and continuing generation students differ by 2 percent, with first generation retention at 92% and continuing generation retention at 94%. All assumptions of logistic regression were met, but the sample size in each group of the outcome (retained vs. not retained) have a severe imbalance, which affects some inferential tests for generalization. However, we can still observe group differences in each variable to note how the sample itself operates in relation to the outcome of retention.

**Model Statistics**

Overall, the model ran here fits the data just as well as an intercept-only model (G2=271.05, p=1.00), where the probability of leaving JMU is modeled with having no predictors. Both models describe approximately 2% of the variance in retention prediction. We would normally use the intercept-only model for the purposes for simplicity in modeling for retention prediction. However, as the purpose was to describe differences between groups’ retention rates, this model will be further dissected.

**Interactions**

All interactions in the model are reported in Table 3. Five of the interactions were significant, meaning the probability of retention differed significantly between certain groups (p’s <.05). These significant interactions are explored in Table 4.

 First generation status moderated whether or not Black students (compared to White), students awarded a federal grant (compared to those who were not awarded a grant), and female students (compared to male) left JMU. In first-generation students, Black students are 1.13 times more likely to leave JMU than White students. However in continuing generation students, White students are 1.25 times more likely to leave JMU than Black students. First generation students who do not receive a federal grant (including the Pell grant) are 2.37 times more likely to leave JMU than those who do receive a grant. In continuing education students, this relative risk is reduced to 1.36. A crossed interaction is also in place when observing gender and first-generation status. In first generation students, female students are 1.18 times more likely to leave than male students. However, in continuing education students, male students are 1.15 times more likely to leave JMU.

 Gender and racial identity also produced a significant interaction. More specifically, in male students, White students are 1.18 times more likely to leave JMU than Asian students. However, Asian female students are 1.39 times more likely to leave JMU than White female students.

 Finally, racial identity is dependent on grant awardee status to predict the probability of leaving JMU. Hispanic students who do not receive a grant are 1.55 times more likely to leave JMU than White students. Conversely, White students who do receive a grant are 2.57 times more likely to leave JMU than Hispanic students.

 All other interactions in the model were not significant, meaning that there was no dependency between those two variables in predicting the probability of retention.

**Single-Order Variables**

Inferential results for single-order variables are at the top of Table 3. All racial groups have a similar probability of retention, with no relative risk being significantly higher or lower than 1 when comparing any two racial groups (all p’s <.05). Female students have a statistically significantly lower retention rate than males ($χ^{2}=8.27$, p>.05), where the odds of retention for females is .82 times the odds of retention for males after controlling for other variables. The odds for first-generation students leaving JMU is 1.5 times the odds of leaving for continuing-generation students ($χ^{2}=9.85$, p<.05) after controlling for other variables. Out of state students’ odds of leaving JMU are 1.59 times the odds of in-state students leaving JMU after controlling for all other variables ($χ^{2}=49.92$, p<.05). Finally, those who received a federal grant have similar odds of retention than those who did not receive a grant, after controlling for other variables in the model ($χ^{2}=3.15$, p>.05).

**Discussion**

This model was formed and tested in order to look at retention as it relates to identity in order to find differences in retention rates among different groups and intersections of students. Although there are minimal differences between the retention of different racial groups on campus, modeling in a way that allows for intersecting, multiple identities tells us differently. When race intersects with identities such as gender, generation status, and grant status, it shows that racially marginalized students are more likely to leave JMU than their White counterparts.

 Another identity that should be paid attention to is generation status. Not controlling for other identities, first generation students are much more likely to leave the institution than continuing generation students. This is also in line with literature on the experiences of first-generation students. When combined with race, gender, or grant status, first-generation students experience a much lower probability of retention than other students.

 Implications from this analysis for the QEP include paying special attention to the following groups of students: (a) first generation; (b) out of state; (c) racially marginalized; (d) those who did not receive a federal grant; and (e) students who fall into two or more of these categories.

**Bringing in Previous Information**

These results seem to be in line with previous information gained by the QEP team. First, previous quantitative analyses laid the foundation for this one by identifying the number of students in each group that left JMU. Focus groups indicated that students in these marginalized groups faced certain experiences on campus that seemed to have been looked over by faculty and staff. Given retention rates are generally high, faculty and staff do not think about how student experiences can lead them to leave the university. As a result, negative experiences may not always be taken as seriously or followed up on as quickly as they could be.

 For the future, the QEP team should not only work on implementing a system, but also work with partners on campus to help faculty, staff, and administrators realize the many experiences that go into retention. Literature about the student groups mentioned above, as well as connecting with these student groups more in-depth, can give us more insight on the experiences of marginalized students on campus.

**Recommendations**

There are three primary recommendations, rooted in future routes of the QEP.

***Recommendation 1: Further analysis of data***

This report shows that although modeling retention from students’ identities can give some information, there is more to the student experience than just their identity. Further analyses should reflect further literature on the skills, attitudes, and knowledge needed for students to stay at JMU. These constructs can be found within the ISSAQ or other first-year surveys.

***Recommendation 2: Design with an intersectional framework***

Although this report does not show the most statistically correct analyses (again, the intercept model is the champion model compared to this one), it reminds us that an intersectional approach to our work is important. More specifically, this analysis proves that the Early Alert System should not just address the needs of each marginalized identity, but also address experiences unique to the intersections of marginalized identities.

***Recommendation 3: Further analysis of identity groups via qualitative inquiry***

This analysis showed that students with various and intersectional marginalized identities are experiencing things on campus unique to them, which leads them to leaving JMU at higher rates than peers who hold intersectional privilege. In order to create a culture of retention on campus, it is imperative that the QEP working group, and the larger campus, learns about these experiences and applies them to the construction and use of the Early Alert System.

**Table 1**

*Sample Characteristics*

|  |  |  |  |
| --- | --- | --- | --- |
| Identity | Category | n | % of sample |
| Race | Asian/Asian American | 1079 | 5% |
|  | Black/African American | 1093 | 5% |
|  | Hispanic/Latinx | 426 | 2% |
|  | Multiracial | 2144 | 10% |
|  | White | 16796 | 78% |
|  |  |  |  |
| Gender | Female | 12452 | 58% |
|  | Male | 9086 | 42% |
|  |  |  |  |
| Generation Status | Continuing Generation | 18546 | 86% |
|  | First Generation | 2992 | 14% |
|  |  |  |  |
| Residency | In-State | 16583 | 77% |
|  | Out-of-State | 4955 | 23% |
|  |  |  |  |
| Grant Status | Awarded | 3823 | 18% |
|  | Not Awarded | 17715 | 82% |
| Total |  | 21538 |  |

**Table 2**

*Count of Retention by Identity*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identity | Category | Retained |  | Not Retained |
| n | % |  | n | % |
| Race | Asian/Asian American | 1006 | 93% |  | 73 | 7% |
|  | Black/African American | 1028 | 94% |  | 65 | 6% |
|  | Hispanic/Latinx | 402 | 94% |  | 24 | 6% |
|  | Multiracial | 2012 | 94% |  | 132 | 6% |
|  | White | 15795 | 94% |  | 1001 | 6% |
|  |  |  |  |  |  |  |
| Gender | Female | 11725 | 94% |  | 727 | 6% |
|  | Male | 8518 | 94% |  | 568 | 6% |
|  |  |  |  |  |  |  |
| Generation Status | Continuing Generation | 17503 | 94% |  | 1043 | 6% |
|  | First Generation | 2740 | 92% |  | 252 | 8% |
|  |  |  |  |  |  |  |
| Residency | In-State | 15694 | 95% |  | 889 | 5% |
|  | Out-of-State | 4549 | 92% |  | 406 | 8% |
|  |  |  |  |  |  |  |
| Grant Status | Awarded | 16592 | 94% |  | 1123 | 6% |
|  | Not Awarded | 3651 | 96% |  | 172 | 4% |
| Total |  |  |  |  |  |  |

**Table 3**

*Logistic Regression Results*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Category | Logit | Odds Ratio | Wald Chi-Square |
| Race | Asian | -0.05 | 0.95 | 0.04 |
|  | Black | 0.04 | 1.04 | 0.03 |
|  | Hispanic | 0.13 | 1.14 | 0.10 |
|  | Multiracial | 0.03 | 1.03 | 0.04 |
|  |  |  |  |  |
| Gender | Female | -0.20 | 0.82 | 8.27\* |
|  |  |  |  |  |
| Generation Status | First-Generation | 0.46 | 1.59 | 9.85\* |
|  |  |  |  |  |
| Residency | Out of State | 0.45 | 1.57 | 49.92\* |
|  |  |  |  |  |
| Grant Status | Grant Awardee | -0.21 | 0.81 | 3.15 |
|  |  |  |  |  |
| Controls | COVID Semester | -0.60 | 0.55 | 98.74\* |
|  |  |  |  |  |
| Two-Way Interactions | Gender\*Asian | 0.56 | 1.74 | 4.39\* |
|  | Gender\*Black | -0.10 | 0.91 | 0.13 |
|  | Gender\*Hispanic | 0.40 | 1.49 | 0.76 |
|  | Gender\*Multiracial | -0.01 | 0.99 | 0.00 |
|  | First-Generation\*Asian | 0.22 | 1.24 | 0.54 |
|  | First-Generation\*Black | 0.75 | 2.11 | 6.44\* |
|  | First-Generation\*Hispanic | -0.11 | 0.90 | 0.06 |
|  | First-Generation\*Multiracial | 0.30 | 1.36 | 1.71 |
|  | First-Generation\*Gender | 0.34 | 1.41 | 4.45\* |
|  | First-Generation\*Grant Status | -0.56 | 0.57 | 8.66\* |
|  | Grant Status\*Asian | -0.56 | 0.57 | 2.65 |
|  | Grant Status\*Black | -0.42 | 0.66 | 1.95 |
|  | Grant Status\*Hispanic | -1.23 | 0.29 | 4.36\* |
|  | Grant Status\*Multiracial | -0.14 | 0.87 | 0.26 |

*Note:* \*p<0.05; Control groups: race= White; Gender= Male; Generation Status= Continuing Generation; Residency= In-State; Grant Status= Not Awarded; COVID semester= Non-COVID semester (before Spring 2020).

**Table 4**

*Second Order Interactions Results*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Category 1 | Category 2 | Left JMU? | Probability of Leaving |  |
| No | Yes | Rel. Risk |
|  |  |  |  |  |  |
| First Gen. | White | 2450 | 222 | 8.3% |  |
|  | Black | 290 | 30 | 9.4% | 1.13 |
| Cont. Gen.  | White | 16765 | 1008 | 5.6% | 1.25 |
|  | Black | 738 | 35 | 4.5% |  |
| First Gen. | No Grant | 1411 | 184 | 11.5% | 2.37 |
|  | Grant | 1329 | 68 | 4.9% |  |
| Cont. Gen.  | No Grant | 15181 | 939 | 5.8% | 1.36 |
|  | Grant | 2322 | 104 | 4.3% |  |
| First Gen. | Male | 987 | 80 |  7.5% |  |
|  | Female | 1753 | 172 | 8.9% | 1.18 |
| Cont. Gen. | Male | 7531 | 488 | 6.1% | 1.15 |
|  | Female | 9972 | 555 | 5.3% |  |
| Male | White | 6610 | 447 | 6.3% | 1.18 |
|  | Asian | 457 | 26 | 5.4% |  |
| Female | White | 9185 | 554 | 5.7% |  |
|  | Asian | 549 | 47 | 7.9% | 1.39 |
| No Grant | White | 13630 | 892 | 6.1% |  |
|  | Hispanic | 191 | 20 | 9.5% | 1.55 |
| Grant | White | 2165 | 109 | 4.8% | 2.57 |
|  | Hispanic | 211 | 4 | 1.9% |  |

*Note:* Rel. Risk= Relative Risk; Rel. Risk Value read as ratio of larger percent over smaller percent within one category (Example: In first generation students, Black students are 1.13 times more likely to leave than White students); First Gen.= First generation; Cont. Gen.= Continuing Generation.

*Note:* Only significant interactions are shown in this table.