

## Examining In-Course Success by Modality during the Pandemic

The Office of Institutional Research, Planning, and Effectiveness (IPRE) has reviewed the enrollment and success data for Hartnell College, since the 2017-18AY, to determine if the pandemic and/or transition to online courses has had an impact on in-course success. We'd like to acknowledge the work of the Curriculum & Scheduling staff who identified the 'actual' instructional methods for each course section during the 2020SU, 2020FA & 2021SP semesters. This was an invaluable step in developing and aligning the data for this study and the development of the following variables:

- **Lab Sections:** Any course sections with any portion of a lab-type component, in accordance with Senate Bill 129 standards
- **Lectures Only:** Any course sections that consist of ONLY lecture components, no lab components, in accordance with Senate Bill 129 standards
- **FULLY IN-PERSON:** Any course section with no option for at a distance student participation, in accordance with Senate Bill 129 standards
- **DISTANCE ED.:** Any course section in which participation is limited to Asynchronous/Synchronous Online and/or Fully Correspondence and no in-person requirements, in accordance with Senate Bill 129 standards
- **HYBRID:** any modality that does not fit into the FULLY IN PERSON and/or DISTANCE\_ED categories or any combination of those options, in accordance with Senate Bill 129 standards
- **Meta\_Majors:** subjects that correspond with meta-major programs (e.g., MAT = STEM, WLD =AG, BUSINESS & INDUSTRY').
  - **Note:** 'APP', 'JAJ', 'JFS', 'HSE', 'WCD', 'COU', 'CWE', 'LSK' subjects do not align with any current meta-major standard, so they're classified as NOT\_META\_MAJOR.
- **Degree/Transfer Vs Skills/Employment:** term-based on student educational goals (e.g., A, B, C, or M), as outlined by the CCCC in the AB705 Validation Template
- **Gender:** self-identified student-level data
- **Race/Ethnicity** self-identified student-level data

We've applied several methods to determine if there were any significant change of in-course success rates including:

- **The 80% Index:** Determine whether a subgroup achieves the desired outcome less than 80% of the time, derived from the Equal Employment Opportunity Commission rule. *This is the CCCC standard for determining disproportionate impact (DI).*
- **Logistic regression** of in-course success rates pre/post-pandemic.

- **Differences in the mean:** flagging in-course success rates when cohorts that were 5% lower than the annual success rates that had at least 10 enrollment records.

**Note:** We conferred with several IR offices on this approach. They all concurred that it was consistent with their methodology, and praised the inclusion of the Logistic Regression.

## **Summary of In-Course Success pre/post Pandemic**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success when compared with pre-pandemic data?

**No,** there were a few indications of disproportionate impact for in-course success rates when disaggregated by Instructional Method, Race/Ethnicity, Gender, Meta-Major, Lab/Lectures and/or Degree/Transfer/Employment, based on the 80% Index. However, most of these cases would be restricted as potential sampling errors as the CCCCO typically restricts data with fewer than 10 records due to variance among small samples.

There were a few groups that were flagged for the difference in the mean, but they represent small cohorts with fewer than 50 enrollment records, which may be subject sampling errors. For example, while there were 74 records for unidentified student gender in 2017-18AY, there were only 38 students in this group. As Hartnell has an enrollment of 9,385 students in 2021FA, this appears to be a small demographic group, subject to sampling errors.

The results of the Logistic Regression for in-course success were inconclusive, as the accuracy of the initial model was low (49.5%, coin-flip) in predicting outcomes, and explained just 0.97% of the variance in student success. Adding First-Term GPA as a control improved the accuracy of the model to a 63% prediction rate and identified but only identified 6.4% of the variance in student success. In my opinion First-Term GPA, which is a reflection of academic preparedness, is the determining factor for in-course success when compared with the other demographic variables in this study. This is evident in the 'Wald Chi-Square' results of the Analysis of Maximum Likelihood Estimates table (Proc Logistic Results, p7).

**Note:** Any apparent issues with in-course success rates for the 2021-22AY, should be resolved once the 2021FA success data is available. The enrollment data for 2021SU and 2021FA, is being compared with 2021SU success data, so once the 2021FA success data is available, things should be more aligned with prior academic years.

**Note:** The APP, NRN, NVN, and RCP subjects account for 77.5% (n=1049) of the FULLY-IN-PERSON course sections and 60% (n=140) of the HYBRID course sections offered

during the 2020-21AY. These are typically high-achieving student groups which could be considered as potential outliers when weighing these results.

**Note:** JPA student records were restricted, as the shift to online coursework is unlikely to impact these students.

### **In-Course Success by Modality**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success by Modality, when compared with pre-pandemic data?

**No**, although, a few groups were flagged as being potential disproportionately impacted, based on the 80% Index, there were fewer than ten enrollment records in each instance. The CCCCCO typically restricts data with fewer than 10 records due to the potential for sampling error (i.e., variance among small samples).

A review of the difference in the mean indicates that the in-course success ratio has improved over time (column Q, R, S) when disaggregated by race/ethnicity and gender, given that these differences are more aligned during the 2019-20AY and 2020-21AY. Most of the student groups flagged for potential disproportionate impact may be restricted due to small sample sizes for example although there appears to be a difference in the mean for African American students, there were only a few African American students taking hybrid course sections during the 2017-18AY (n=25), 2018-19AY (n=39) and 2019-20AY (n=28).

### **In-Course Success by Gender**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success by Gender, when compared with pre-pandemic data?

**No**, there was no indication of any disproportionate impact for in-course success rates disaggregated by gender, based on the 80% Index.

There were a few differences in the mean for unidentified students (column F), but it's not clear whether this is a reflection of personal involvement/persistence or an issue with self-identification (e.g., non-binary gender). Studies have shown that students who persist are more likely to identify with the college culture/program/values, which may impact their decision to share personal information. This behavior is similar to when people share their contact information to receive discounts (i.e., loyalty card). Those who don't are less likely to identify

with the organization, are less likely to invest their energies and/or persist within the organization.

### **In-Course Success by Race/Ethnicity**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success by Race/Ethnicity, when compared with pre-pandemic data?

**No**, the only indication of any disproportionate impact for in-course success when disaggregated by race/ethnicity was a small group of Hawaiian/Pacific Islanders (81 enrollment records for 17 students) during the 2018-19AY. This is the only time that this group is identified, so there is no indication of a trend based on the 80% Index.

Most of the differences in the mean success rates, when disaggregated by demographic groups are relatively small groups (~50 enrollment records), which may indicate sampling error. In addition, the number of 'Unidentified' students increased dramatically in 2020-21AY, which may have impacted these results. This could be a reflection of personal involvement/persistence more than an issue with self-identification (e.g., non-binary gender).

### **In-Course Success by Gender and Race/Ethnicity**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success by Gender and Race/Ethnicity, when compared with pre-pandemic data?

**No**, there are several indications of disproportionate impact for in-course success when disaggregated by gender, race, and ethnicity, most of whom represent small samples ( $n < 10$ ) that would otherwise be restricted as potential sampling errors (e.g., only four enrollment records for one unidentified African American student in 2017-18AY), based on the 80% Index. The only potential area of disproportionate impact was among female American Indian students in 2017-18AY and unidentified Hawaiian/Pacific Islanders in 2018-19AY, but there is no indication of consistency over time.

Most of the differences in the mean success rates, when disaggregated by demographic groups are relatively small groups ( $n < 10$ ), which may indicate sampling error. In addition, the number of 'Unidentified' students increased dramatically in 2020-21AY, which may have impacted these results. There may be a trend among Hawaiian/Pacific Islanders, but the number of students is relatively small which may indicate sampling error (e.g., only 16 Hawaiian/Pacific Island

students in 2017-18AY, 17 students in 2018-19AY, 26 students in 2019-20AY and 23 students in 2020-21AY).

### **In-Course Success by Meta-Major**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success by Meta-Major, when compared with pre-pandemic data?

**No**, there were only two indications of potential disproportionate impact for in-course success when disaggregated by meta-majors and gender, which would have been restricted due to sampling errors ( $n < 10$ ), based on the 80% Index. There are a few indications of potential disproportionate impact for in-course success rates when disaggregated by meta-majors and race/ethnicity, most of whom represent small samples ( $n < 10$ ) that would otherwise be restricted (e.g., only eight American Indian students in the AG, BUSINESS & INDUSTRY in 2018-19AY). The only cohort with potential disproportionate impact were African American students during 2017-18AY and/or 2018-19AY. However, these issues were not present during the 2019-20AY and/or 2020-21AY, so there was no consistency over time.

Most of the differences in the mean success rates, when disaggregated by demographic groups were relatively small ( $n < 10$ ), which would typically be restricted for potential sampling errors. The indications of any potential disproportionate impact show improvement over time when comparing 2017-18AY & 2018-19AY data with 2019-20AY & 2020-21AY data, so there was no consistency over time.

The in-course success rates for Hawaiian/Pacific Islanders in the Arts & Science programs could indicate a disproportionately impacted group, but they also represent a small demographic group with enrollments ~20 course sections in a given year.

### **In-Course Success by Lab/Lecture**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success by Lab Vs Lecture course sections, when compared with pre-pandemic data?

**No**, there were no indications of disproportionate impact for in-course success when disaggregated by gender and/or race/ethnicity, based on the 80% Index.

There were a few differences in the mean success rates, when disaggregated by demographic groups, which represent relatively small groups (~50 enrollment records), which may indicate sampling error.

### **In-Course Success by Degree/Transfer Vs Skills/Employment**

**Research Question:** Has the transition to online coursework had a negative impact on in-course success by Degree/Transfer Vs Skills/Employment, when compared with pre-pandemic data?

**No**, there were no indications of disproportionate impact for in-course success when disaggregated by gender, race, and ethnicity that would not be restricted for sample size ( $n < 10$ ), based on the 80% Index.

There were a few differences in the mean success rates, when disaggregated by demographic groups, but there was no consistency over time.