



# CWID DATA NOTE

## Does the Associate's Degree Matter? Evidence from Hawaii and Ohio

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### Background

A primary rationale for the Credit When It's Due (CWID) initiative and reverse transfer programs is that many transfer students do not earn a bachelor's degree and often leave college with substantial amounts of college credit but no college credential. Data from the National Student Clearinghouse show that only 62% of students earn a bachelor's degree or higher six years after transfer (Shapiro et al., 2013). Similarly, results from the CWID Baseline Report show that approximately half of transfer students who were identified as potentially eligible for a reverse transfer associate's degree had no bachelor's degree four years after transfer, yet two-thirds of these students transferred to the university with 45 or more college credits (Taylor, Bishop, Makela, Bragg, & Ruud, 2013). Reverse transfer programs associated with the CWID initiative are intended to confer associate's degrees to students when students have met the appropriate degree requirements so students do not leave college without a college credential.

A fundamental question associated with reverse transfer policies relates to the *value of the associate's degree*. Because reverse transfer programs are a relatively new innovation, there is no existing research on the impact of receiving an associate's degree *after transfer*. The CWID Impact Study currently underway is addressing this question in the context of reverse transfer implementation efforts. However, until these data are available, it is instructive to examine whether receiving an associate's degree prior to transfer predicts students' bachelor's degree attainment. Thus, the purpose of this data note is to use data from the CWID Baseline Dataset to understand the influence of the associate's degree *prior to transfer* on bachelor's degree outcomes. Because all associate's degrees are not created equal, this analysis also examines how the type of associate's degree (e.g., Associate of Arts, Associate of Sciences, Associate of Applied Science) relates to bachelor's degree completion.

The following two research questions are answered in this brief:

1. What is the difference in bachelor's degree completion rates between students who transfer with an associate's degree and without an associate's degree?
2. Controlling for pre-transfer factors, does completing an associate's degree prior to transfer predict bachelor's degree completion?

### Literature

There is very little evidence related to the predictive power of an associate's degree on bachelor's degree attainment. The most

recent data come from the National Student Clearinghouse whose data accounts for bachelor's degrees earned at 94% of the nation's postsecondary institutions. Their data show that approximately 55% of students who transfer without an associate's degree complete a bachelor's degree after four years compared to 71% of students who transfer with an associate's degree (National Student Clearinghouse, 2012). These data suggest that an associate's degree matters for bachelor's degree attainment, but this analysis relies on descriptive data only and does not control for factors that may influence bachelor's degree attainment. In an earlier study, Ehrenberg and Smith (2003) analyzed data from the State University of New York (SUNY) system to examine transfer between 2-year and 4-year institutions. Their sample included students who transferred from a SUNY 2-year community college to a SUNY 4-year university and were enrolled full-time in fall 1995 or 1996 (n=13,383). Although they did not account for demographic differences (e.g., race/ethnicity, gender, SES, etc.), they controlled for sending institution and distance between receiving and sending institutions. Their regression model found that students who transferred with an Associate of Arts or Associate of Science degree had about a 20 percent higher probability of receiving their bachelor's degree three years after transfer than students who transferred without an associate's degree or certificate. Crosta and Kopko (2014) examined the effect of an associate's degree on transfer students' bachelor's degree completion rate in one state. Using logistic regression, their analysis found that students who transferred with any associate's degree were about 3% more likely to complete a bachelor's degree within four years and 6% more likely within six years. When separated by degree type, they found that students who transferred with an Associate of Arts or Associate of Science were 4% more likely to complete a bachelor's degree within four years and 11% more likely to do so within six years, but found a null effect for students who transferred with an Associate of Applied Science degree.

### Method

To answer the research questions, we used the CWID Baseline Study Dataset. The states of Hawaii and Ohio were purposefully selected for this study because these datasets included an adequate population of transfer students to construct the comparison group. The datasets included students who transferred to a public university in Fall 2008 in the two states. Transfer students were defined as students who transferred with at least one college-level credit. The datasets included enrollment and degree completion records through Spring 2012, which allowed us

to determine bachelor's degree completion four years after transfer. An important delimitation of the datasets is that they only included enrollment and bachelor's degree completion data for students at public institutions within the two states, not private or out-of-state institutions. The two datasets included 10,351 students, but 1,092 students had missing data on at least one of the variables needed for the regression. Casewise deletion was used for the regression analysis, so the final analytical sample included 9,259 students, 2,558 of which were from Hawaii and 6,701 were from Ohio.

To answer the first research question, descriptive statistics were used to calculate bachelor's degree completion rates. To answer the second research question, logistic regression was used to determine if associate's degree attainment prior to transfer predicts bachelor's degree attainment, controlling for important pre-transfer factors. To construct the dependent variable, students were grouped into two categories: students who completed a bachelor's degree by Spring 2012 and students who did not complete a bachelor's degree by Spring 2012. It is important to note that 16% of students in the Hawaii sample and 19% of students in the Ohio sample were still enrolled at the university in Spring 2012, but because we were interested in bachelor's degree attainment, these students were coded as not completing a bachelor's degree.

Several pre-transfer covariates were included in the regression models that the literature suggests are influential in student success and completion. Covariates included demographic variables (race/ethnicity, gender, age at time of transfer) and prior academic performance and history (remediation participation, transfer GPA, and credits earned prior to transfer). Of particular interest to this study were the covariates associated with *associate's degree completion prior to transfer*. Two models were run for each state; the first model aggregated all associate's degrees into one category and the second model disaggregated by associate's degree type (e.g., Associate of Arts, Associate of Sciences, Associate of Applied Science) to determine the relative influence of different associate's degree types.

## Results

Descriptive outcomes for bachelor's degree attainment are reported in Figure 1. Results from Hawaii show that the percentage of students who completed a bachelor's degree four years after transfer was 62%, which was 10% higher than students

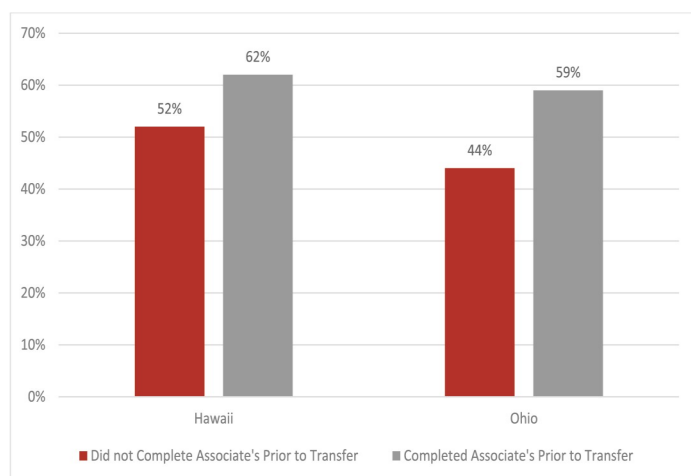


Figure 1: Bachelor's Degree Completion by Associate's Completed Prior to Transfer

who transferred without an associate's degree (52%). In Ohio, the results show that 59% of students who transferred with an associate's degree completed a bachelor's degree within four years, compared to 44% of students who transferred without the associate's degree. These results support prior descriptive research that shows students who transferred with an associate's degree had higher bachelor's degree completion rates (National Student Clearinghouse, 2012). Although the descriptive results suggest that earning an associate's degree prior to transfer is important to bachelor's degree completion, this analysis did not account for other pre-transfer factors that may have influenced bachelor's degree attainment.

Table 1 in Appendix A reports results from the logistic regression models for Hawaii and Ohio separately and includes the average marginal effects (AME). The AME is most useful for interpretation and represents the change in the value of the dependent variable (bachelor's degree completion) as the independent variable increases by one unit. Model 1 and Model 3 aggregate all associate's degree earners into one variable in the analysis, and Models 2 and 4 provide estimates for associate's degree type as well as certificate. Overall, the results suggest that after controlling for demographic and pre-transfer academic variables, the associate's degree mattered but so did the type of associate's degree. Further, the results suggest that the influence of associate's degree type differed by state, perhaps due to the state policy context and the lack of articulation of applied associate's degrees. Before reporting the regression results, it is important to qualify the results by noting that the results are not causal nor do they account for post-transfer factors that may influence bachelor's degree completion.

The models for Hawaii (Model 1 and 2) show that no demographic variables were statistically significant, but students' GPA prior to transfer and the number of credits earned prior to transfer were significant ( $p < .001$ ). The marginal effect for completing any associate's degree prior to transfer was .05 ( $p < .10$ ), meaning that students who transferred with any associate's degree were 5% more likely to complete a bachelor's degree four years after transfer relative to students who transferred with no associate's degree, holding other factors constant. Results from Model 2 suggest that the type of associate's degree also matters. The results show that the likelihood of completing a bachelor's degree was 12% ( $p < .001$ ) higher for students who transferred with an Associate of Arts degree compared to students who transferred with no degree, whereas the likelihood was 29% ( $p < .01$ ) lower for students who transferred with an Associate of Applied Science degree compared to students who transferred with no degree.

The results for Ohio show that demographic and pre-transfer academic factors were significantly related to transfer students' success four years after transfer. In both Models 3 and 4, the marginal effects for Black Non-Hispanic, Hispanic, Male, and students Age 25 and Older were negative and statistically significant, and the marginal effects for transfer GPA and credits earned prior to transfer were positive and statistically significant. Interestingly, completing any type of associate's degree was not a statistically significant predictor in the third model when all associate's degrees were aggregated into one group. However, the fourth model shows that after controlling for demographic and pre-transfer academic factors, completing an Associate of Arts

(AME=0.06,  $p<.05$ ) or an Associate of Science (AME=0.06,  $p<.10$ ) prior to transfer were statistically significant predictors of success four years after transfer. That is, students who transferred with an Associate of Arts or Associate of Science were 6% more likely to completion a bachelor's degree within four years compared to students who transferred with no associate's degree.

Figure 2 displays the average marginal effects for all four models and is a visual representation of the relative effect of prior credential attainment on bachelor's degree attainment. Compared to students who transferred with no degree or certificate, transferring with an Associate of Arts degree in Hawaii increased the likelihood of receiving a bachelor's degree by 12%. Receiving an Associate's of Arts in Ohio resulted in a 6% increase in the likelihood of receiving a bachelor's degree, a slightly smaller effect than in Hawaii. Similarly, the Associate of Science degree had a negative effect in Hawaii (-5%) whereas it had a positive effect of a similar magnitude in Ohio (6%). This result can be explained by the fact that the Associate of Science degree is a technical degree in Hawaii but it is a transfer degree in Ohio. It follows that the Associate of Applied Science (AAS), the technical degree in Ohio, had a much larger effect in Ohio (-29%) than Hawaii because a small proportion of the sample (1%) completed an AAS in Hawaii.

### Implications

One purpose of this analysis was to understand what pre-transfer factors related to bachelor's degree attainment, including the relative importance of earning an associate's degree prior to transfer. Overall, the results show that after controlling

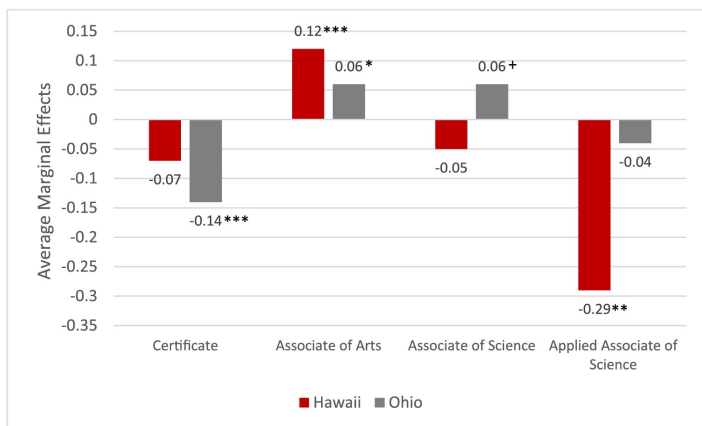


Figure 2: Average Marginal Effects

for important demographic and academic characteristics, earning an associate's degree prior to transfer matters but so does the type of associate's degree. It is important to note that not all associate's degrees are designed as transfer degrees. It is likely that the credits from an Associate of Arts (in HI & OH) or an Associate of Science (in OH) were more likely to be accepted for transfer by the receiving university, which explains part of the results. Similarly, it is likely that credits from the Associate of Science (in HI) and the Associate of Applied Science (in OH) were also less likely to be accepted for transfer by the receiving university.

In the context of reverse transfer, this study provides evidence that reverse transfer programs and policies may benefit some students. That is, students who transfer without the associate's degree may be at risk of not completing a bachelor's degree, and providing transfer students the opportunity to earn an associate's degree via reverse transfer may affect students' bachelor's degree outcomes. For example, earning an associate's degree while en route to the bachelor's degree may serve as an important marker of students' progress and provide momentum for students to continue toward the bachelor's degree. However, future research is needed to understand the effect of receiving an associate's degree *after transfer*, and we are investigating this in the CWID Impact Study.

### References

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## APPENDIX A

*Table 1*  
Pre-Transfer Factors Predicting Bachelor's Degree Completion Four Years after Transfer (by Spring 2012)

| Variable   | Hawaii                  |                         | Ohio                    |                         |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
|  | Model 1                 | Model 2                 | Model 3                 | Model 4                 |
|  | Average Marginal Effect | Average Marginal Effect | Average Marginal Effect | Average Marginal Effect |
| Race (White)   |                         |                         |                         |                         |
| American Indian/Alaskan Native                       | -0.16 (0.10)            | -0.17 (.10)             | 0.02 (0.10)             | 0.01 (0.10)             |
| Asian or Pacific Islander                            | 0.01 (0.02)             | 0.01 (.02)              | 0.03 (0.03)             | 0.03 (0.04)             |
| Black, Non-Hispanic                                  | -0.03 (0.07)            | -0.04 (0.24)            | -0.14*** (0.02)         | -0.14*** (0.02)         |
| Hispanic   | -0.02 (0.05)            | -0.01 (0.05)            | -0.11** (0.03)          | -0.12*** (0.03)         |
| Nonresident  | --                      | --                      | -0.05 (0.07)            | -0.05 (0.07)            |
| Male (Female)  | -0.02 (0.02)            | -0.03 (0.02)            | -0.07*** (0.01)         | -0.07*** (0.01)         |
| Age 25 and Older (Age 18-24)                         | -0.01 (0.02)            | -0.01 (0.02)            | -0.13*** (0.02)         | -0.13*** (0.02)         |
| Participated in Remediation (Did not participate)    | -0.03 (0.03)            | -0.02 (0.03)            | -0.03* (0.01)           | -0.03* (0.01)           |
| Transfer GPA   | 0.06*** (0.02)          | 0.06*** (0.02)          | 0.17*** (0.01)          | 0.17*** (0.01)          |
| Number of Credits Earned Prior to Transfer (in Tens) | 0.02*** (0.003)         | 0.02*** (0.003)         | 0.04*** (0.002)         | 0.04*** (0.002)         |
| Degrees Earned Prior to Transfer                     |                         |                         |                         |                         |
| Cert. (No degree)                                    | --                      | -0.07 (.06)             | --                      | -0.14*** (0.04)         |
| Associate of Arts (No degree)                        | --                      | 0.12*** (.03)           | --                      | 0.06* (0.03)            |
| Associate of Science (No degree)                     | --                      | -0.05 (.06)             | --                      | 0.06+ (0.04)            |
| Applied Associate of Science (No degree)             | --                      | -0.29** (.09)           | --                      | -0.04 (0.03)            |
| Any Associate (No degree)                            | 0.05+ (0.03)            | --                      | -0.01 (0.02)            | --                      |
| Model Statistics                                     |                         |                         |                         |                         |
| R <sup>2</sup>                                       | 0.03                    | 0.03                    | 0.11                    | 0.11                    |

+*p*<.10, \* *p* <.05, \*\* *p* <.01, \*\*\* *p* <.001

Note: Reference groups are in parentheses in variable column; Standard errors reported in parentheses next to marginal effects