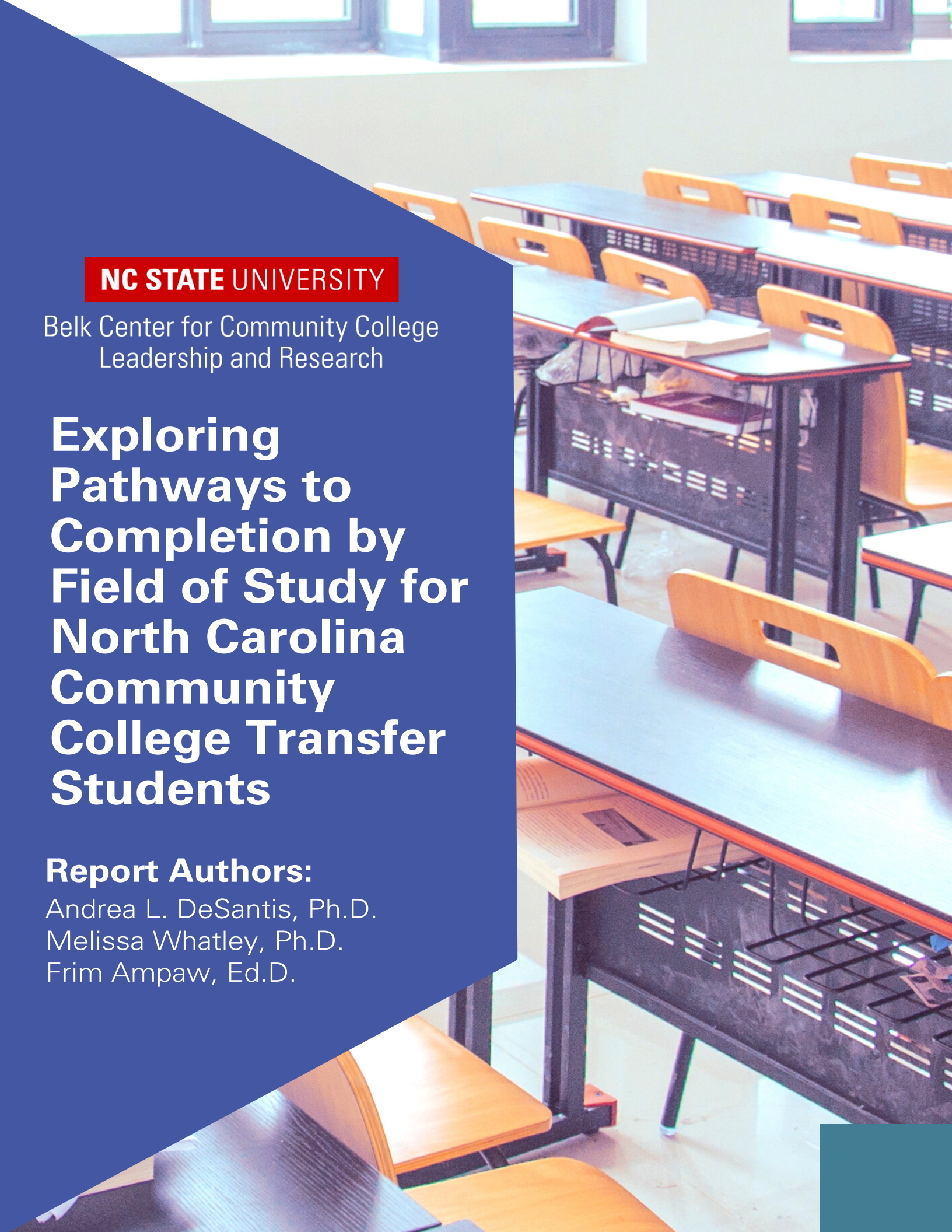




NC STATE UNIVERSITY

Belk Center for Community College
Leadership and Research

Exploring Pathways to Completion by Field of Study for North Carolina Community College Transfer Students

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About the Belk Center

The Belk Center for Community College Leadership and Research, at North Carolina State University, develops and sustains exceptional community college leaders who are committed to advancing equitable college access and student success, the social and economic mobility of their colleges' students, and the economic competitiveness of their regions. The Center provides professional development and research related to current and emerging student success opportunities and challenges facing community college leaders and policymakers in North Carolina and the nation. The Belk Center commits to dismantling systemic barriers to racial equity in education through evidence-based strategies that focus on the outcomes of Black, Latin* and American Indian students ([read our full Commitment to Equity here](#)).

About the John M. Belk Endowment

Based in Charlotte, North Carolina, the John M. Belk Endowment is a private family foundation committed to transforming postsecondary educational opportunities to meet North Carolina's evolving workforce needs. Its mission is aligned with the vision of its founder, the late John M. Belk who served four terms as mayor of Charlotte and was CEO of the department store company Belk, Inc. He created the John M. Belk Endowment in 1995 to fund a national merit scholarship program for his beloved alma mater, Davidson College. Now led by Mr. Belk's daughter, MC Belk Pilon, the John M. Belk Endowment continues to partner with innovative, results-oriented programs in North Carolina to further Mr. Belk's values, legacy, and focus on the value of education as a means to personal fulfillment and community vitality.

For more information, please visit <http://jmbendowment.org>.

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INTRODUCTION

A bachelor's degree is widely considered a means to promote and improve individuals' economic stability for quite some time (Carnevale et al., 2011; Ma et al., 2019). Recent estimates from the U.S. Census Bureau indicate that adults with a bachelor's degree earn up to \$15,000 more annually (U.S. Census, 2019). Credential and degree attainment at both 2-year and 4-year institutions will likely be even more important for individual economic stability as the U.S. economy recovers in a post-pandemic environment. In North Carolina, occupations requiring at least a bachelor's degree are predicted to grow at the fastest rate, providing an opportunity for the state and postsecondary institutions to think strategically about how to train North Carolinians to fill these roles (NC Department of Commerce, 2020). The purpose of this report is to explore North Carolina transfer students' pathways to bachelor's degree completion, focusing especially on their field of study. Highlighting transfer students' field of study uncovers opportunities to improve outcomes in high-demand, high-wage fields that have the potential to promote economic mobility of individuals and communities across the state, especially for those who start at a community college.

The North Carolina Department of Commerce predicts the fastest growing industries over the next decade are in Health Care and Social Assistance and Professional, Scientific, and Technical Services (Jolley, 2020; NC Department of Commerce, 2020). These industries include medical scientists, accountants, auditors, computer software engineers, and nurses (Jolley, 2020). With the exception of nursing, the majority of these occupations require at least a bachelor's degree (Jolley, 2020). Given both the differences in demand for particular careers and the anticipated wages for those positions, the field of study a student decides to pursue can have a powerful impact on their likelihood of finding sustainable employment. This relationship between a student's selected field of study and their economic outcomes has been heavily researched in higher education (Mayhew et al., 2016). This research has shown fairly consistent evidence that students majoring in a STEM field (Science, Technology, Engineering, and Mathematics) fare better regarding post-graduation earnings compared to students in other fields (Hu & Wolniak, 2010; Melguizo & Wolniak, 2012; Thomas & Zhang, 2005; Wolniak et al., 2008). For example, Melguizo and Wolniak (2012) found that majoring in a STEM field had a 25% earnings premium compared to students in a Humanities or Education field.

Considering North Carolina's statewide attainment goal to increase the number of North Carolinians with high-quality credentials and promote economic mobility of an additional 400,000 citizens, optimized pathways into in-demand careers will be necessary (myFutureNC, 2019). The information shared in this report, in the context of existing state and local labor market data, is designed to support policymakers and leaders that are grappling with challenging questions around how to prepare enough students to fill the predicted openings in the workforce while promoting individual and community economic mobility. Analyses that highlight differences in transfer student outcomes by field of study and by institution uncover suggestions of where to direct attention and resources to further support student success. This information is also important for students and their families to consider as they explore available transfer pathways and the likelihood of academic and economic success in particular fields.

REPORT STRUCTURE

In this report, we present recent data describing pathways to bachelor's degree completion by field of study from students who transferred from North Carolina Community College System (NCCCS) institutions to a public four-year institution within the University of North Carolina (UNC) System. The first section of this report defines a field of study as the student's degree program at the community college, namely associate in arts (AA), associate in science (AS), applied associate in science (AAS), associate in fine arts/associate in general education (AFA/AGE), or no community college degree.¹ The second section of the report defines the field of study as the student's declared degree program at the four-year institution and includes categories corresponding to STEM, Computer and Information Sciences, Industrial and Applied Technologies, Health, Business, Education and Child Care, Human Services and Public Safety, Social and Behavioral Sciences, and Arts, Humanities, Communication, and Design (see Yanagiura, 2018 for additional information about this classification scheme).

In both sections of the report, we focus on a transfer student's pathway to bachelor's degree completion, and we provide information about transfer student success at various points along this pathway, in each case, disaggregated by field of study. First, we provide information regarding the number of credits a student was able to apply to their declared degree program at the point of transfer. We then explore how long students were enrolled at UNC System institutions and how many credits they accumulated while they were enrolled. Finally, we provide information regarding bachelor's degree completion itself.

DATA

The data that inform this report were provided by the UNC System Office and correspond to students who transferred to a UNC System institution from a North Carolina Community College during either the fall 2014 semester (N=7,455) or the fall 2015 semester (N=7,889). Table 1 contains demographic information about these students, combining both cohorts. This dataset contained information about students' pathways to bachelor's degree completion, specifically their UNC System institution, the number of credits they were able to apply to their declared degree program at the time of transfer, the cumulative number of credits they earned at their UNC institution, how many semesters they were enrolled at the UNC institution, and whether and when students completed a bachelor's degree. We limit the dataset to students who transferred in 2014 and 2015 so that we can report four-year post-transfer completion rates (200% time) for students who transferred after the implementation of the revised Comprehensive Articulation Agreement in North Carolina in 2014. This dataset also contained information

“In both sections of the report, we focus on a transfer student's pathway to bachelor's degree completion, and we provide information about transfer student success at various points along this pathway.”

¹ This dataset does not include students who transferred with an Associates in Engineering (AE) as the first students to transfer into a UNC System institution after earning that degree was in the Fall of 2019 according to the UNC System dashboards.

about whether a student earned a degree at their community college prior to transferring (e.g., an AA, AS, or AAS degree) and their declared degree program at the four-year institution. This information provides rich context surrounding the transfer pathways of community college students in North Carolina.

Table 1. Combined Demographic Information about Fall 2014 and Fall 2015 NCCCS-to-UNC System Transfer Students

Demographic Statistics	N	Percent Sample
Sex		
Female	8,392	54.7%
Male	6,952	45.3%
Race/Ethnicity		
American Indian or Alaska Native	166	1.1%
Asian	496	3.2%
Black or African American	2,633	17.2%
Latin* ²	1,186	7.7%
Native Hawaiian or Other Pacific Islander	23	0.2%
Non-Resident Alien	202	1.3%
Two or more races	460	3.0%
Unknown Race and Ethnicity	430	2.8%
White	9,748	63.5%
Residency		
In-state	15,072	98.2%
Out-of-state	272	1.8%
Pell student		
Yes	5,980	39.0%
No	9,364	61.0%

² Following Salinas (2020), we use Latin* to refer to individuals that may have been classified as Latinx, Latino, Latina, Latine, or Hispanic using other classification structures and data sources. The term Latin* is respectful of the various linguistic groups that comprise this racial/ethnic identification and is sensitive to a variety of gender identities.

PATHWAYS TO COMPLETION BY COMMUNITY COLLEGE DEGREE

This section provides various metrics regarding transfer student success according to the kind of credential that a student earned at the community college. In our sample, about half of transfer students did not earn any credential prior to transfer (N=7,756, 50.6%). The most frequent degree earned was an AA degree (N=4,098, 26.7%), followed by an AAS degree (N=2,329, 16.2%). Other degrees that students earned prior to transfer included AS (N=947, 6.2%) and AFA/AGE degrees (N=214, 1.4%). We present student success metrics in roughly the chronological order in which transfer students experience them.

First, we consider the community college credits that applied to a student's bachelor's degree program at the time of transfer. We then consider the average number of semesters³ and the average credits earned among transfer students who completed a bachelor's degree within four years. Finally, we present information regarding four-year completion rates. Each of these metrics is presented according to four community college credential categories: No degree, AA, AS and AAS. We are unable to report these metrics for AFA/AGE earners as there were too few of them in our dataset to maintain student confidentiality. In this study, we choose to look at these four groups given their high rates of transfer. Only the AA and AS were designed and are designated as transfer associate's degrees, whereas the AAS as originally intended was not designed for transfer. Over the past several years, the number of students who earn this degree and then decide to transfer has continued to increase, suggesting that students are behaving differently after earning this degree than in the past.

Overall Student Success Metrics

Table 2 displays student success metrics by the credential that a student completed at their community college. We focus on the following success metrics:

- » Credits Applied at Transfer
- » Semesters Completed at 4-Year Institutions
- » Total Credits Earned at 4-year
- » Graduation Rate within 4-years of Transfer

AAS earners were able to apply the most credits at the time of transfer, 75.0 on average, while students who did not earn a community college credential applied the fewest, 47.9 on average. Both AA and AS degree earners applied between 68 and 70 credits at transfer. It is noteworthy that both the AA and AS degrees are designed to be 60 credits. It appears students are taking additional courses beyond those required for the degree while at the community college and in some instances those additional courses are transferring to the UNC system institution even though the Comprehensive Articulation Agreement only guarantees the transfer of 60 credits.

Applied credits did not always translate into less time spent at the four-year institution or fewer credits earned at graduation. Regarding the number of semesters enrolled at the four-year institution, students who did not complete a community college credential enrolled the longest (almost 8 semesters), while AA completers were enrolled the shortest amounts of time at the four-year institution (around 6 semesters). Students who earned an AS at the community college prior to

³ This metric was calculated by dividing the academic year into three parts: fall, spring, and summer. If a student was enrolled in any summer term option, they were counted as enrolling for the summer term.

transfer had earned the most credits at the time of bachelor's degree completion on average (142.5), followed closely by AAS earners (141.1). Students who completed no community college credential and those who completed an AA degree had earned the fewest credits by bachelor's degree completion (134.6 and 135.7, respectively).

Finally, students who completed an AS degree at the community college prior to transfer had the highest four-year graduation rate (69.6%), followed closely by AA degree earners (69.4%). The lowest four-year graduation rate was among students who earned an AAS prior to transfer (51.4%).

Table 2. Student Success Metrics for All Transfer Students and Bachelor's Degree Completers by Community College Credential Completed

	Credits Applied at Transfer	Semesters Completed at 4-Year	Credits Completed	4-year graduation rate
No Credential	47.9	7.5	134.6	55.1 %
AA	68.2	6.3	135.7	69.4 %
AS	69.5	6.7	142.5	69.6 %
AAS	75.0	6.6	141.1	51.4 %

These same metrics disaggregated by the student's UNC institution are found in Appendix A.⁴

PATHWAYS TO COMPLETION BY BACHELOR'S DEGREE FIELD OF STUDY

This section provides the same metrics as the previous section, but with data disaggregated by the student's declared four-year field of study⁵ rather than the community college credential that they earned. In our sample, the largest number of transfer students enrolled in a bachelor's degree program in STEM (N=2,509) followed by a Business field (N=2,472). Additional fields of study that transfer students selected included Arts, Humanities, Communication, and Design (N=2,430), Human Services and Public Safety (N=2,022), Social and Behavioral Sciences (N=2,010), and Health (N=1,886). Smaller numbers of students enrolled in four-year programs in Education

In this study, STEM includes degree programs in Agriculture, Natural Resources, Engineering, Science Technologies, Mathematics, Statistics, Natural Sciences, Neuroscience, Marine Sciences, Physical Sciences, Biology, Biomedical sciences, and Biopsychology.

⁴ While system-level information is useful for understanding the overall success of students who transfer from NCCCS institutions to the UNC system, this individual institution data is helpful for college and university staff and administrators, particularly academic advisors and senior leadership, at both two- and four-year institutions, to identify opportunities to improve transfer pathways within particular fields.

⁵ For the purposes of these calculations, we used the last declared degree program available for each student in the dataset. For graduates, this is their declared degree program when they graduated.

and Child Care (1,021), Computer and Information Sciences (N=663), and Industrial and Applied Technologies (N=87).

As shown in Table 3, students who majored in a Health field were able to apply the most community college credits to their bachelor's degree program. Their average of 77.9 applied credits was followed by students in a STEM field (61.2 credits on average) and Education and Child Care (59.6 credits on average). Students in Arts, Humanities, Communication, and Design and those in Computer and Information Sciences were able to apply the fewest average credits to their bachelor's degrees at transfer, applying averages of 53.4 and 53.6 credits, respectively. Students in Computer and Information Sciences and Industrial and Applied Technologies spent the most average time at the four-year institution prior to bachelor's degree completion (averages of 7.6 and 7.7, respectively), while students in Health fields were enrolled in the lowest average number of semesters (6.3 semesters). Regarding credits earned at bachelor's degree completion, students in Education and Child Care had earned the most average credits (144.5), followed closely by students in STEM (143.7) fields. Those in Social and Behavioral Sciences had earned the fewest average credits at the time of bachelor's degree completion (129.6). Finally, four-year graduation rate was highest for students studying Social and Behavioral Sciences (65.1%). This completion rate was followed closely by students in Business and Computer and Information Sciences fields (both 62.3%). The lowest four-year completion rate was among students in Industrial & Applied Technologies (49.4%).

Table 3. Average Student Success Metrics for All Transfer Students and Bachelor's Degree Completers by Declared Degree Program

Areas	Percent AAS	Credits Applied at Transfer	Semesters Completed	Credits Completed	4-year Graduation Rate
STEM	14.0%	61.2	7.3	143.7	57.8%
Computer & Information Sciences	14.0%	53.6	7.6	141.1	62.3%
Industrial & Applied Technologies	20.0%	49.1	7.8	141.0	49.4%
Health	40.0%	77.9	6.3	140.9	59.0%
Business	12.0%	56.8	7.0	133.9	62.3%
Education & Child Care	17.0%	59.6	7.7	144.5	59.6%
Human Services & Public Safety	20.0%	55.8	6.8	132.3	60.0%
Social & Behavioral Sciences	4.0%	55.9	6.6	129.6	65.1%
Arts, Humanities, Communication, & Design	6.0%	53.4	6.9	133.2	57.6%

IMPLICATIONS

This report's results have important implications for community college students' ability to successfully transfer and complete a bachelor's degree, thus impacting their ability to access higher-paying jobs and subsequent economic stability (Carnevale et al., 2011; Ma et al., 2019). Given that occupations requiring a bachelor's degree or higher are expected to grow at an even faster rate in North Carolina in the future (North Carolina Employment Projections, 2020; Jolley, 2020), understanding successful community college transfer student pathways to UNC System institutions is increasingly important for students in our state.⁶ This report explored outcomes related to transfer student success, namely number of credits applied at transfer, time spent at the four-year institution, number of credits accumulated at graduation, and graduation itself, from two perspectives: the perspective of the community college degree that a student earned prior to transfer and the perspective of the student's bachelor's degree program. These success metrics speak not only to student success in completing a bachelor's degree, but also to intermediate steps in the bachelor's-degree-earning process that represent the efficiency with which transfer students earn this credential.

Regarding the community college credential that a student earned prior to transfer, our results underscore the importance of earning an associate's degree prior to transfer, a result consistent with previous literature on community college transfer students (e.g., Kopko & Crosta, 2016). In our study, students who earned an associate's degree, regardless of which kind, prior to transfer were able, on average, to apply more credits to their degree program when they transferred and were enrolled less time at their four-year institution. Given the differences in tuition charges when comparing community colleges and four-year institutions in North Carolina - for example, tuition for a single term of in-state full-time enrollment at an NCCCS institution costs around \$1,200 while similar charges at the state's flagship institution, UNC-Chapel Hill, total around \$4,400 - these metrics indicate the potential for substantial financial savings (NCCCS, 2019; UNC-Chapel Hill, 2021). Our results also indicate that students who transfer with AS or AAS degrees earn more credits upon graduating from the four-year institution, suggesting a situation wherein students earn credits in excess of those typically required for a bachelor's degree. Students earning these credentials prior to transfer may find themselves in a situation where the credits they earned at the community college are not sufficient to meet certain bachelor's degree requirements, and thus they have to enroll in additional courses at the four-year institution. AAS-earners are also at a disadvantage regarding bachelor's degree completion. These students experienced the lowest completion rate when comparing our community college credential groups, even compared to students who did not earn a community college credential prior to transfer. This result is cause for concern given that AAS students represent a growing population of transfer students in our state.

Policymakers and practitioners would benefit from further examining institutional data to explore issues with equity that may arise within AAS programs, including popular programs such as nursing. Furthermore, while AAS students may benefit from some local articulation or uniform articulation they are not guaranteed to transfer with junior status under the CAA as their peers who complete AA/AS currently are. Considerations for how to further protect AAS students through current articulation agreements provides an opportunity to advance the success of these students.

⁶ Of course, transferring to a public, four-year institution is not the only way a community college student can earn a bachelor's degree in North Carolina. Private institutions in the state also offer opportunities for community college students to transfer and earn a bachelor's degree. However, data from these institutions was not available to us at the time this study was conducted.

When considering transfer students' field of study at the four-year institution, our results indicated that students in Health fields were able to apply more community college credits to their degree program at transfer and also spent less time enrolled at the four-year institution. Many of these students were enrolled in Nursing programs. Upon further inspection, we found that half of Nursing transfer students earned an AAS at their community college prior to transfer (see Table 4), suggesting the presence of individual articulation agreements that facilitated the transfer process for students in this particular field. In general, the pathway to a bachelor's degree in a Health field appears to be a particularly efficient one for students who transfer from NCCCS institutions. This result is particularly promising in the context of North Carolina's projected workforce needs. The North Carolina Department of Commerce recently predicted that Health Care would be one of the fastest-growing industries in the state (North Carolina Employment Projections, 2020), including occupations such as medical scientists and nurses (Jolley, 2020).

Table 4. Community College Credentials Earned by Transfer Students in Nursing Fields at UNC System Institutions (Fall 2014 and Fall 2015 Cohorts)

Community College Credential	Number	Percentage
No degree	442	40.7%
AA degree	78	7.2%
AS degree	13	1.2%
AAS degree	548	50.4%
AFA/AGE	6	0.6%

Students in the Social and Behavioral Sciences also appeared to fare relatively well after transfer to the four-year institution. These students spent a relatively low amount of time at the four-year institutions, earned lower levels of credits at the time of graduation, and also accounted for the highest bachelor's degree completion rate among the bachelor's degree categories in this study (65.1%). In contrast, in STEM fields, another area where North Carolina is projected to experience significant job growth (Jolley, 2020) and where students experience average higher earnings after degree completion (Hu & Wolniak, 2010; Melguizo & Wolniak, 2012; Thomas & Zhang, 2005; Wolniak et al., 2008), students accumulate a relatively high number of credits prior to graduating and experience a lower likelihood of completion within four years of transfer.

Taken together, these results point to areas of strength and areas for improvement regarding bachelor's degree completion in North Carolina:

Areas of Strength:

- » **Associate's degree earners of any type are able to apply more credits when they transfer** and also spend less time at the four-year institution.
- » **The transfer process for students in Health fields appears to be efficient**, particularly regarding community college credit applicability and the amount of time students enroll at the four-year institution.
- » **Students in the Social and Behavioral Sciences also experience high success** relative to their peers in other fields.

Areas for Improvement:

- » **AS and AAS students have excess credit accumulation** when they graduate from the four-year institution.
- » **AAS students appear to experience barriers to successful bachelor's degree completion**, an area of consideration given the increasing rate at which these students enroll at four-year institutions.
- » **Students in STEM and Education & Child Care fields also appear to experience barriers to success**, evident in the accumulation of more credits at graduation and lower bachelor's degree completion rates.

CONCLUSION

Efficient transfer pathways are necessary to fill high demand fields in North Carolina, knowing that jobs that require at least a bachelor's degree are growing at the fastest rates in the state (North Carolina Employment Projections, 2020). Developing and refining existing pathways and policies that promote successful transfer and graduation into these fields will allow for the state to meet industry demands for a trained workforce as well as the statewide attainment goal. As leaders, policymakers, and practitioners consider ways to support transfer, careful attention must be paid to the equity in access to and outcomes from these pathways. Transfer provides an opportunity for students to obtain a bachelor's degree in one of these high demand areas (Whatley, et al., 2021). This opportunity is particularly important because community colleges serve a disproportionate number of low-income and students of color⁷, especially students receiving Pell grants and American Indian, Black and Latin* students, compared to their four-year counterparts. Transfer pathways have the potential to be equitable; they can promote degree attainment and social mobility for the aforementioned student groups when transfer policy is intentional about promoting equity (Felix, 2020; Wellington-Baker & Hammer, 2020).⁸

⁷ Defined as students who identify as American Indian or Alaska Native; Black or African American; or Hispanic of any race in the UNC System data used for the report.

⁸ For additional information about student success metrics by UNC institution and community college credential, see https://belk-center.ced.ncsu.edu/wp-content/uploads/2021/10/Transfer-Report-5_Belk-Center_Appendix.pdf.

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