

Improving Graduation Rates of Low-Income Undergraduate Students at Virginia Four-Year Public Colleges and Universities

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Disclaimer

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

Honor Pledge

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

A handwritten signature in black ink, appearing to read "Katherine Nawrot". The signature is written in a cursive, flowing style.

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Table of Contents

Client Overview	5
Executive Summary	6
Introduction.....	7
Why Does This Problem Exist?	8
Costs to Society.....	9
Background.....	10
Evidence Review	14
Evaluative Criteria	18
Alternatives	19
1. Status Quo.....	19
2. Completion Grant Program.....	19
3. Outcomes-Based Funding Model	20
4. Data-Driven Advising.....	20
Findings.....	21
Evaluation of Alternatives	22
Outcomes Matrix	27
Recommendation	27
Implementation: Completion Grant Program	28
Appendix A: Cost to Society Explanation	30
Appendix B: Cost-Effectiveness Analysis.....	31
Appendix C: Alternative Ranking Calculations	39
References.....	40

Client Overview

Great Aspirations Scholarship Program, Inc. (GRASP) is a college access nonprofit that operates in 90 high schools across central, eastern, and southern Virginia (*2019-2020 Program Results*, n.d.). GRASP supports students in acquiring funding for postsecondary education, with an emphasis on helping financially disadvantaged households (*About*, n.d.). Their mission includes “assisting [students and their families] with the financial aid process and awarding scholarships; and supporting them in the attainment of their postsecondary goals at the lowest possible cost” (*About*, n.d., Our Mission section). Given the rising cost of postsecondary education and the disparate impact this has on low-income students (*The Virginia*, 2019), GRASP is interested in exploring strategies to better support low-income students pursuing higher education.

Executive Summary

Higher education is crucial to improving individual earnings and economic wellbeing (Carnevale et al., 2011; Trostel, 2015). Yet, in Virginia, only 61% of low-income students who enrolled in four-year public colleges during the 2011-2012 school year graduated within six years, compared to 82% of high-income students (*GR-SC01*, n.d.) *Too few low-income students in Virginia graduate from four-year public universities.*

This report evaluates four policy alternatives to close the graduation gap between low-income and high-income students at Virginia's four-year public higher education institutions. The following policy alternatives are evaluated and compared based on the criteria of cost-effectiveness, political feasibility, equity, and ability to implement.

1. Status Quo
2. Completion Grant Program
3. Outcomes-Based Funding Model
4. Data-Driven Advising

The final recommendation of this report is for Virginia to implement a completion grant program. This alternative would establish a state grant program to provide emergency financial aid to students facing unexpected financial hardships. A completion grant program is the most cost-effective in comparison to the other alternatives. Additionally, a completion grant program has a high ability to implement because it is similar to other state-level higher education grants. Additionally, the State Council of Higher Education for Virginia (SCHEV) already has experience administering other institutional grants (*Fund*, n.d.). Therefore, Virginia should implement a completion grant program to support low-income students on the path to graduation.

Introduction

Problem Definition

Too few low-income students in Virginia graduate from four-year public universities. Individuals who earn a bachelor's degree benefit from higher lifetime earnings than those who drop out of college (Trostel, 2015; Carnevale et al., 2011). However, in Virginia, only 61% of low-income students enrolled in four-year public colleges during the 2011-2012 school year graduated within six years, compared to 82% of high-income students (*GR-SC01*, n.d.).¹ If left unaddressed, the disparity in four-year college graduation rates between low-income and high-income students will persist.

It is crucial that more low-income students at four-year public universities in Virginia complete their degrees in order to improve economic mobility and meet the state's workforce goals. The postsecondary educational attainment rate of the Virginia population as a whole is 54% (*The Virginia*, 2020). Increasing the educational attainment in Virginia will support the Commonwealth's economy and help Virginians meet changing workforce demands (*The Cost*, 2019; *The Virginia*, 2019). SCHEV aims to increase the number of working adults with postsecondary credentials so that 60% of workers in Virginia have an associate's degree or more by 2030 (*The Cost*, 2019; *The Virginia*, 2019). This is about a 6 percentage point increase relative to the current level of Virginia workers with postsecondary credentials.

This report explores and analyzes potential policy options that the state of Virginia could implement to improve the graduation rate of low-income students at Virginia's four-year public colleges and universities.

¹ Low-income is defined as having an income 200% or below the federal poverty level, and high-income is defined as having an income 401% or above the federal poverty level (*GR-SC01*, n.d.). The federal poverty guideline for a family of four is \$26,500 (*Poverty*, 2021).

Why Does This Problem Exist?

Cost of Higher Education

The growing cost of college tuition has made postsecondary educational attainment increasingly challenging for low-income students. The average cost of attending a private or public four-year college and a public two-year college in the United States has continually increased over the past thirty years (Ma et al., 2020). Nationally the average cost to attend a four-year public college or a two-year public college is about \$10,600 and \$3,800, respectively (Ma et al., 2020). In Virginia during the 2020-2021 school year, the average cost of tuition and fees for in-state undergraduate students at a four-year public college was about \$14,000, and the cost to attend a two-year community college was about \$5,000 (*2020-21 Tuition*, 2020). These higher education costs in Virginia are above the national average. Between 2002-2012, the cost of tuition and fees at public four-year colleges and universities in Virginia more than doubled, increasing by about 120% (*Addressing*, 2014). Furthermore, the growing cost of four-year public higher education has outpaced growth in average income (*Addressing*, 2014). The average proportion of income needed to pay for higher education in Virginia increased by 50% from 1993-2012 (*Addressing*, 2014). The majority of low-income college students in Virginia (about 89%) have *less than half* of their financial needs covered by expected family contributions and government grants (*The Virginia*, 2020). For low-income students, the rising cost of undergraduate tuition and fees has an exceptionally high financial impact (*The Virginia*, 2019).

While the cost of tuition and fees at public higher education institutions in Virginia has increased, institutional spending per student has also increased (*Addressing*, 2014). The majority of increased institutional spending goes toward non-academic areas such as athletics and building renovations or construction (*Addressing*, 2014). A smaller proportion of increased spending goes towards other areas, such as educational instruction and support services (*Addressing*, 2014). Furthermore, the level of state funding also impacts the cost of higher education for students in Virginia (*Addressing*, 2014; *Higher Education Funding*, 2020).

Institutional Selectivity

The selectivity of institutions is associated with the likelihood that students graduate (Bound et al., 2010; Fry & Cilluffo, 2019). While more low-income students are enrolling in college, they tend to enroll at institutions that are less selective and have lower graduation rates compared to selective institutions (Fry & Cilluffo, 2019). In other words, many low-income students attend schools that have low overall graduation rates, where few students graduate anyway (Whistle & Hiller, 2018). Additionally, selective colleges have higher per-student spending to support student's academic success (Bound et al., 2010; Fry & Cilluffo, 2019 as cited in Hoxby, 2019). Even when holding test scores constant, students have a better chance of graduating from a selective college than from a less selective college (Carnevale & Van Der Werf, 2017 as cited in Carnevale & Strohl, 2010). Therefore, the choice of where low-income students go to college also affects their graduation rates (Carnevale & Van Der Werf, 2017). Since more low-income students attend institutions with low overall graduation rates (Whistle & Hiller, 2018), this contributes to the gap in graduation rates between low-income and high-income students.

Costs to Society

The following section estimates the potential direct and opportunity costs that stem from fewer low-income students graduating from four-year public colleges in Virginia. I assume that about 3,700 low-income students in each cohort do not graduate from four-year institutions. Please see Appendix A for a detailed explanation of the calculations and assumptions used to estimate the costs to society.

Direct Costs

The problem of fewer low-income students graduating from college in Virginia has direct costs associated with unemployment and the utilization of welfare programs. Students who do not graduate from college are more likely to experience unemployment than their peers who do graduate (Trostel, 2015; *Unemployment*, 2019). Additionally, students who do not complete a postsecondary degree are more likely to use public assistance programs than students who graduated (Trostel, 2015).

An individual with some college education uses approximately \$24,000 (in 2012 dollars) more in public assistance programs, such as SNAP, Medicaid, and housing subsidies, throughout their lifetime than someone with a bachelor's degree (Trostel, 2015). Assuming that a total of 3,700 low-income students in each cohort do not graduate from college, this would equate to an additional public assistance cost of about \$88.8 million over these students' lifetimes.

Additionally, individuals with only some college education use about \$2,000 (in 2012 dollars) more in unemployment insurance over their lifetimes than individuals with a bachelor's degree (Trostel, 2015). This would result in an additional lifetime unemployment insurance cost of about \$7.4 million per cohort.

Opportunity Costs

Opportunity costs associated with fewer low-income students graduating from college in Virginia include lower wages and shorter life expectancy. Trostel (2015) found that workers with some college education earn approximately \$24,600 (2012 dollars) less per year than those with a bachelor's degree. Similarly, Carnevale et al. (2011) estimated that workers with some college education earn about \$33,000 (2009 dollars) less per year than those with a bachelor's degree.

Furthermore, life expectancy differs based on educational attainment (Rostron et al., 2010). The life expectancy for women with some college education is about four years less than for women with a college degree (Rostron et al., 2010). The life expectancy for men with some college education is about five years less than for men with a college degree (Rostron et al., 2010). Thus, the lost lifetime earnings for an individual college drop-out is between \$984,000 and \$1.32 million. This equates to a total lost lifetime income of approximately \$3.64 billion to \$4.88 billion for each cohort.

Therefore, the total direct and opportunity costs associated with fewer low-income students graduating from four-year public institutions in Virginia are between approximately \$3.74 billion and \$4.98 billion per cohort.

Background

National and State-Level Graduation Gaps

Disparities in college graduation rates based on income also exist at the national level in the United States (Ginder et al., 2018; Whistle & Hiler, 2018). Nationally, there are gaps in college graduation rates between students who received Pell Grants (federal grants for low-income students) and those who did not (Ginder et al., 2018; Whistle & Hiler, 2018). This exemplifies the gap in college graduation rates between lower-income and high-income students. Nationally, there is an 18 percentage point gap in the graduation rates between students who receive Pell Grants and those who do not (Whistle & Hiller, 2018).

At the state level, there is also variation in the graduation rates of Pell Grant recipients (Whistle & Hiller, 2018). Pell-Serving Institutions (schools that enroll a high proportion of Pell Grant recipients) in Alabama, Louisiana, New Hampshire, Rhode Island, Connecticut, Colorado, and Wyoming have particularly poor graduation rates (at or below 50%) for Pell Grant students (Whistle & Hiler, 2018). On the other hand, California has a large number of Pell-Serving Institutions with comparatively higher graduation rates for Pell Grant students (Whistle & Hiler, 2018).

Virginia: Low-Income Student Enrollment at Postsecondary Institutions

In Virginia, during the fall of 2018, only about 27% of in-state undergraduate students at four-year public colleges came from low-income households (*Low Income and Potentially*, n.d.). About 28% of in-state undergraduates at two-year colleges were low-income students (*Low Income and Potentially*, n.d.). In 2018, about 60% of the low-income undergraduate students at four-year public universities identified as racial or ethnic minorities (*Low Income and Potentially*, n.d.).² At two-year public colleges, about 56% of low-income undergraduates identified as racial or ethnic minorities (*Low Income and Potentially*, n.d.). Table 1 below shows the racial and ethnic breakdown for low-income students at Virginia public postsecondary institutions. The majority of low-income students at both four-year and two-year institutions were white and Black students comprised the second-largest low-income student group.

² Racial or ethnic minority refers to students who identify as Latinx/Hispanic, Black, Asian, Multicultural, Hawaiian or Pacific Islander, Native American or Alaskan Native (*Low Income and Potentially*, n.d.).

Table 1: Demographics of Low-Income, In-State Undergraduate Students in Virginia, by Institution-Type (Fall 2018)

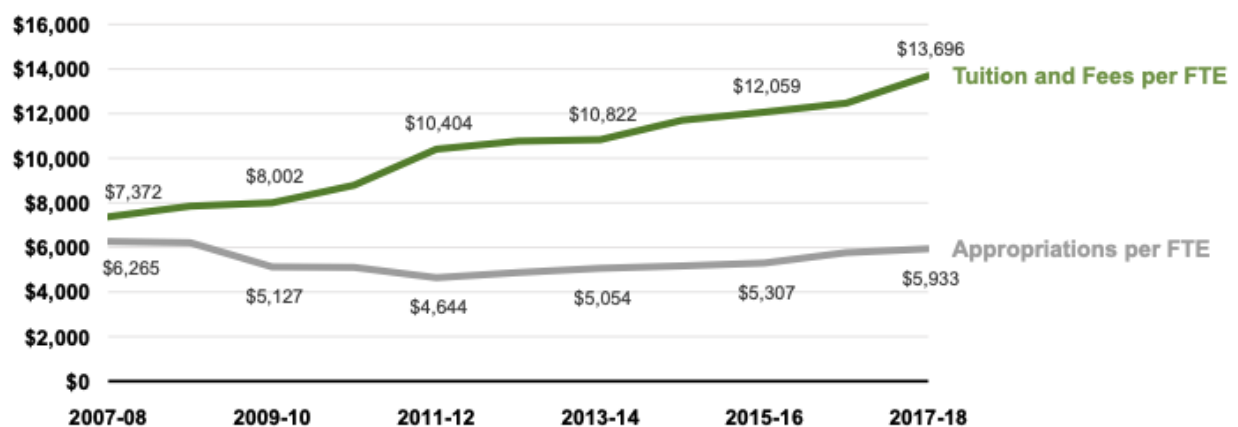
Percentage of Low-Income Students by Race and Ethnicity		
Race and Ethnicity	Four-Year Public Institution	Two-Year Public Institution
Latinx/Hispanic	11.7%	13.2%
Black	28.7%	29.5%
Asian	13.9%	7.9%
Multicultural	5.3%	4.6%
HI'an/Pac. Islander	0.1%	0.2%
Am/AK Native	0.2%	0.4%
White	34.3%	43.2%
Missing Data	5.7%	1.0%

Source: *Low Income and Potentially*, n.d.

Funding for Higher Education

Federal, state, and local governments fund higher education (National Commission on Financing 21st Century Higher Education, 2016). Virginia tax revenue, referred to as the general fund, helps fund public higher education (*Higher Education Funding*, 2020). In the fiscal year 2020, about 10% of the general fund went towards supporting higher education (*Higher Education Funding*, 2020). Tuition and fees at Virginia's four-year public universities have increased in recent years, while state appropriations have decreased (*Virginia College*, 2021). Graph 1 below shows the divergent trend in the state appropriations for higher education and tuition and fees at four-year public institutions per full-time equivalent (FTE) student in Virginia. Additionally, state funding differs between two-year community colleges and four-year public colleges and universities (*Higher Education Funding*, 2020). As seen in Graph 2 below, more education and general support (E&G) appropriations go to four-year baccalaureate institutions than two-year community colleges granting associates degrees (*Higher Education Funding*, 2020).

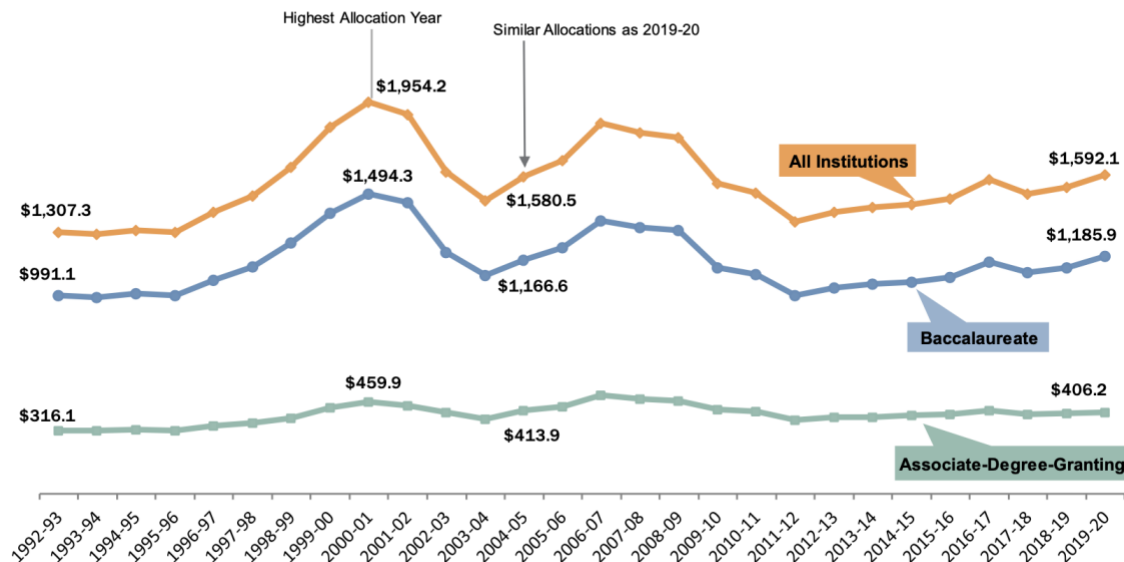
Graph 1: Virginia State Appropriations for Higher Education and Tuition & Fees at Four-Year Public Institutions



Source: SREB-State Data Exchange

Source: *Virginia College*, 2021

Graph 2: Virginia General Fund E&G Appropriations by Institution-Type



Source: *Higher Education Funding*, 2020

Federal Financial Aid: Pell Grants

The federal Pell Grant is a form of need-based financial aid for qualifying low-income undergraduate students (Dortch, 2018; *Federal Pell*, n.d.). According to the Congressional Research Service, the federal Pell Grant program is "the single largest source of federal grant aid supporting postsecondary education students" (Dortch, 2018., p. 1).

The maximum Pell Grant award amount for the 2021-2022 school year is \$6,495 (*Federal Pell*, n.d.), and the amount of the award changes from year to year (Dortch, 2018; *Federal Pell*, n.d.). Students apply for Pell Grants by submitting the Free Application for Federal Student Aid (FAFSA) (Dortch, 2018; *Federal Pell*, n.d.). The federal government awards Pell Grants based on information that students submit in the FAFSA, including financial need as well as the cost of attendance (COA) (Dortch, 2018; *Federal Pell*, n.d.). In the past, the majority of Pell Grants went to students with family incomes of \$60,000 or less (Dortch, 2018). The program operates so that any qualifying student who submits the FAFSA will receive a Pell Grant regardless of how many eligible students apply (Dortch, 2018).

In 2018-2019, 34% of undergraduate students in the United States received a Pell Grant (*Financial Aid-What*, n.d.). In Virginia during the 2018-19 school year, about 30% of in-state students at four-year public institutions received Pell Grants, and about 33% of in-state students at two-year public institutions received Pell Grants (*FA09*, n.d.). The total Pell Grant award amount for in-state students at public four-year and two-year institutions in Virginia during 2017-2018 was about \$3.4 million (*FA09*, n.d.).

Virginia State Financial Aid

Virginia has six primary state-level financial aid programs for undergraduate students (*Financial Aid Program*, n.d.). Table 2 below provides an overview of the different state financial aid programs.

Table 2: Virginia Financial Aid Programs

Program Name	Description
Virginia Commonwealth Award	Grant for Virginia resident undergraduates attending a public institution (two-year or four-year), based on financial needs (<i>Financial Aid Programs</i> , n.d.).
Virginia Guaranteed Assistance Program	Grant for Virginia resident undergraduates attending a public institution (two-year or four-year), based on financial need, merit, and full-time enrollment (<i>Financial Aid Programs</i> , n.d.).
Virginia Tuition Assistance Grant Program	Grant for Virginia resident undergraduates attending a private higher education institution in Virginia full time (<i>Financial Aid Programs</i> , n.d.).
Two-Year College Transfer Grant	Grant for Virginia residents who recently graduated with an associate's degree from a community college in Virginia and then transferred to a participating four-year institution, based on merit, financial need, and full-time enrollment (<i>Financial Aid Programs</i> , n.d.).
Virginia Military Survivors & Dependents Education Program	Program provides educational benefits to eligible military service members and dependents attending public institutions in Virginia (<i>Virginia Military</i> , n.d.).
New Economy Workforce Credential Grant	Grant for Virginia residents attending community college in Virginia, based on enrollment in training for specific in-demand fields (<i>Financial Aid Programs</i> , n.d.).

Governance

In Virginia, the governor, the General Assembly, state committees, SCHEV, and the board of visitors for each institution are involved in higher education (*Key*, n.d.) SCHEV is the coordinating government body responsible for higher education and has a council composed of 13 members (*Key*, n.d.). The Virginia Secretary of Education oversees the council (8VAC40, 2019). SCHEV is involved in the academic, budget, and funding aspects of higher education, conducts research, and makes policy recommendations (*Key*, n.d.). SCHEV is responsible for creating the statewide strategic plan and oversees state aid programs for students (*Key*, n.d.). SCHEV has regulatory authority under Virginia Code Title 23.1 (8VAC40, 2019).

There are two major higher education laws in Virginia, the Restructured Higher Education Financial and Administrative Operations Act of 2005 (Restructuring Act) and the Higher Education Opportunity Act of 2011. The Restructuring Act allows Virginia public colleges and universities to set their tuition and fees and gives these institutions more operational freedom (Spigel, 2005). The Restructuring Act also mandates that public colleges and universities commit to reaching state performance goals by creating six-year plans (Spigel, 2005). The Higher Education Opportunity Act of 2011, also called the Top Jobs Act, aimed to increase the number

of postsecondary degrees awarded in the Commonwealth (*Higher Education Opportunity*, n.d.). Under current policies in Virginia, SCHEV certifies higher education institutions based on the Institutional Performance Standards as set out by the 2005 Restructuring Act and the Virginia Higher Education Opportunity Act of 2011 (*Institutional*, n.d.).

Evidence Review

The following section reviews existing evidence about interventions that may help improve college graduation rates in the United States, with a focus on supporting low-income students. This review of the existing evidence synthesizes research primarily from academic journals, higher education organizations, and programs in other states. The research provides takeaways regarding financial aid, higher education funding, student advising, and support programs in relation to improving college graduation rates for low-income students.

I. Need-Based Grants

Researchers have found that financial aid improves college access, for example, by increasing college enrollment among low-income students (Erwin et al., 2020; Nguyen et al., 2019). Furthermore, research has determined that grants have a greater impact on college completion for low-income students than loans (Gershenfeld et al., 2019). Castleman and Long (2016) examined the effect of the need-based Florida Student Access Grant (FSAG) on college graduation rates. The researchers determined that additional need-based aid (\$1,300) positively impacted the six-year bachelor's degree graduation rate, improving the chance of graduating by 4.6 percentage points (Castleman & Long, 2016). This study has limitations in that the researchers only analyzed in-state students at public Florida universities who completed the FAFSA (Castleman & Long, 2016).

Goldrick-Rab et al. (2016) analyzed the impact of need-based grants on low-income students' college graduation, using a randomized grant distribution design. This study examined college success outcomes, including graduation rates, among low-income freshman undergraduate students in a sample of public universities in Wisconsin (Goldrick-Rab et al., 2016). The researchers found that a \$3,500 grant had a statistically significant effect on graduation rates for low-income students (Goldrick-Rab et al., 2016). There was a 5 percentage point increase in the likelihood of on-time (four-year) bachelor's degree completion for students who received the need-based grant compared to students who did not (Goldrick-Rab et al., 2016). Goldrick-Rab et al. (2016) noted that small sample size was a potential limitation of the study. Additionally, at the time of publication, the study only analyzed the impact of the need-based grant on the graduation rates of one class cohort (Goldrick-Rab et al., 2016).

II. FAFSA Requirements

Since completing the FAFSA is a vital step for students to access financial aid for higher education, some states now require high school students to complete the FAFSA. Louisiana, Illinois, and Texas require high school students to submit the FAFSA to graduate (Granville, 2020). The Louisiana State Board of Elementary and Secondary Education mandated FAFSA completion as a requirement for high school graduation in 2015 (*Financial Aid: Key*, n.d.). This policy requires that students either submit the FAFSA, an application for state aid, or an opt-out form to graduate from high school (*Financial Aid*, n.d.). The FAFSA graduation requirements in

Illinois and Texas are relatively recent, but Louisiana saw an increase in FAFSA completion - (about 10 percentage points) after implementing the new graduation requirement (Granville, 2020). Bettinger et al. (2012) conducted a randomized field experiment and found that FAFSA assistance services increased college enrollment for high school students. While research has shown that FAFSA completion can increase college enrollment (Bettinger et al., 2012), it is unclear how FAFSA completion ultimately impacts low-income students' graduation rates at four-year institutions.

III. Free Tuition Programs

Some states also have free tuition programs to make higher education more affordable (Perna et al., 2017). Tennessee has a grant called Tennessee Promise, which builds on existing financial assistance, such as the Pell Grant and state grants, to provide community college students with funding to cover any remaining unmet tuition and fee costs (Perna et al., 2017). An analysis of the initial program impact found that Tennessee Promise was associated with about an 8 percentage point increase in the five-semester graduation rate for the first cohort of community college students (Locker, 2018). However, given that the Tennessee Promise program is only for community college students, these results may not be generalizable to four-year institutions.

In the fall of 2017, New York implemented the Excelsior Scholarship, which also works like a last-dollar program by providing financial aid to cover any outstanding tuition costs after other scholarships and grants are applied (Burdick, 2017). Students at public two-year and four-year universities in New York who meet certain family income requirements can use the Excelsior Scholarship for tuition (Perna et al., 2017). Nguyen (2019) found that after initial implementation, the Excelsior Scholarship did not have an impact on full-time enrollment at New York higher education institutions. However, given that both the Tennessee Promise and Excelsior Scholarship programs are relatively recent, it is unclear how these initiatives will fully impact long-term student outcomes like college graduation rates (Perna et al., 2017).

IV. Completion Grants

In addition to more traditional forms of need-based aid, some states and institutions use completion grants to help low-income students graduate. In 2017, Minnesota created a state-level completion grant program called the Emergency Assistance for Postsecondary Students (EAPS) Grant Program (DeSalvo, 2020). This grant program aims to provide financial support to students facing an unexpected financial emergency that may otherwise cause them to drop out of school (DeSalvo, 2020). The maximum grant award is \$1,000, and the most common use of the emergency grants is for housing-related expenditures (DeSalvo, 2020). Since the Minnesota program is relatively recent, there is not yet data on the impact of completion grants on graduation rates. However, at the majority of institutions in Minnesota with completion grant programs in 2018-2019, the fall to spring semester retention rate of grant recipients was higher than for the overall student population (DeSalvo, 2020).

Individual universities have also created completion grant programs. Georgia State University implemented a completion grant program called the Panther Retention Grant, which gave small grants (typically under \$1,000) to low-income students with an outstanding need to help them continue staying enrolled in school (*Higher Education Transformation*, 2015). Virginia Commonwealth University (VCU) also has a completion grant program, which was associated

with a 2 percentage point increase in the six-year graduation rate (*Foiling*, n.d.). The VCU program identifies students with unmet needs who are close to graduating and focuses on students pursuing science, technology, engineering, math, and healthcare degrees (*Foiling*, n.d.). The program at VCU serves about 100 students each year with a maximum grant award of \$2,500 (*Foiling*, n.d.). Additionally, the Coalition of Urban Serving Universities and the Association of Public Land Grant Universities organized a completion grant pilot program at several public universities (*Completion*, 2018). Nine universities took part in the program, and 93% of students who received a grant either remained enrolled in school or graduated (*Completion*, 2018). Furthermore, emergency need-based financial aid programs have gained more attention since the COVID-19 pandemic (*Higher Ed Budgets*, 2020).

V. Funding for Higher Education

Strategic higher education funding strategies may help improve the graduation rates of low-income students. Bound et al. (2010) found that funding for colleges and universities impact graduation rates. In the United States, a high proportion of students who do not graduate attend less selective institutions with less funding (Bound et al., 2010). Deming and Walters (2017) found that increased government spending on higher education had a statistically significant effect on improving graduation rates for students in bachelor's degree programs, which may be associated with improvements in instruction and support services like mentoring programs when schools received more funding.

Certain states have also used performance-based funding (PBF) policies to incentivize colleges and universities to meet state performance goals and outcomes, such as graduation rates, in return for additional funds (Kelchen, 2018). Favero and Rutherford (2020) examined the impact of PBF on college and university performance outcomes and found mixed results. Previous research found that PBF policies could have adverse effects on equity by encouraging universities to enroll more students perceived to have a higher chance of graduating (Kelchen, 2018, as cited in Kelchen & Stedrak, 2016; Shulock, 2011). As a result of this unintended effect on college enrollment selectivity, many states have adjusted their PBF policies to give extra weight to outcomes for low-income and minority students (Kelchen, 2018). Li (2019) found that equity weight policies were associated with additional college programs to support underrepresented students, such as mentoring and advising programs (Li, 2019). Li (2019) also found that these policies increased admissions selectivity, despite equity weight provisions. However, there are limitations to the generalizability of this study since it only analyzed a small number of universities in Pennsylvania and Ohio (Li, 2019).

Gándara and Rutherford (2018) examined the effect of equity weights in PBF policies on low-income and minority student enrollment at four-year colleges and universities. The researchers found mixed results for different student populations, with a positive enrollment effect for low-income and Hispanic students and a negative enrollment effect for Black students (Gándara & Rutherford, 2018). This study does have limitations because the researchers did not account for funding differences in different equity-weighted PBF policies (Gándara & Rutherford, 2018). Additionally, this study focused on the enrollment of underrepresented students at four-year universities rather than graduation rates.

More recently, states have begun adopting outcomes-based funding (OBF) policies that expand on PBF (National Commission on Financing 21st Century Higher Education, 2016). Unlike PBF, OBF policies tie a more significant amount of funding to achieving performance outcomes, thereby creating a greater financial incentive for colleges and universities to improve student success (National Commission on Financing 21st Century Higher Education, 2016). OBF policies can also put additional weight on successful outcome measures for traditionally underrepresented students such as low-income and minority students (National Commission on Financing 21st Century Higher Education, 2016). Tandberg and Hillman (2014) examined the effect of performance funding 2.0 policies (also called OBF) and found that these policies did not have a statistically significant impact on college completion until approximately seven years after the policy was implemented. Furthermore, Tandberg and Hillman (2014) noted that in the seventh year, this performance funding only had a small effect on degree completion.

Oregon has an OBF model for higher education that focuses on equity (Cannon & Pinkard, 2019; *Strategic Finance*, 2019) and allocates a large portion of funding based on graduation rates (Cannon & Pinkard, 2019). Oregon's OBF model awards 49% of funding based on college completion and provides about \$3,000 in additional funding per low-income graduate (Cannon & Pinkard, 2019). The Oregon model also includes equity weights for underrepresented minority students, veterans, and students from rural areas (Cannon & Pinkard). Overall, studies on the effectiveness of OBF policies are mixed (National Commission on Financing 21st Century Higher Education, 2016). However, this may be the case because many states have not tied significant funding to their OBF policies, thereby limiting the incentive structure for colleges and universities to improve student outcomes (National Commission on Financing 21st Century Higher Education, 2016).

VI. Student Advising Support

Additionally, student support programs and initiatives may also help improve graduation rates for low-income students. Bettinger and Baker (2014) conducted a randomized study where college students were randomly selected to receive advising services from a coaching organization. The study found that students who received coaching were 4 percentage points more likely to graduate in four years compared to students who did not receive coaching (Bettinger & Baker, 2014). These results are based on data for only three graduating cohorts (Bettinger & Baker, 2014), which may limit the generalizability of the findings. Additionally, Nguyen et al. (2019) determined that financial aid programs that incorporated support for students, in addition to a grant award, had stronger effects on student success outcomes. Furthermore, Webber and Ehrenberg (2010) found that increasing funding for student services improved graduation rates, especially at less selective colleges with a higher proportion of low-income students/Pell Grant recipients. Thus, a variety of evidence supports the importance of college advising services for student success.

Targeted student advising programs supported by data can support low-income students in completing their degrees (*Higher Education Transformation*, 2015; National Commission on Financing 21st Century Higher Education, 2016; *Strategic Finance*, 2019). Georgia State University implemented a data-driven advising program using predictive analytics (*Higher Education Transformation*, 2015). The system at Georgia State assists students in choosing courses and majors based on historical grade data, which helps students complete degree

requirements more quickly (*Higher Education Transformation*, 2015; National Commission on Financing 21st Century Higher Education, 2016). Predictive data analytics at Georgia State also help advisors proactively intervene to support students who may be struggling (Bailey et al., 2019). Georgia State University's six-year graduation rate increased by 22 percentage points over 11 years as the university used data-driven advising and other student support initiatives (*Higher Education Transformation*, 2015). However, it is difficult to identify the direct effect of data-driven advising reforms since other factors may also impact student outcomes (Bailey et al., 2019).

Takeaways

Previous research, studies, and programs provide insights regarding the effectiveness of need-based financial aid in the form of grants, government funding strategies for public higher education, and advising support in closing the graduation gap between low-income and high-income students.

Evaluative Criteria

This section examines the criteria used to evaluate alternatives to close the four-year college graduation gap between low-income and high-income students in Virginia.

Cost-Effectiveness

Cost-effectiveness is a measurement of total costs divided by the outcome. The outcome of interest is the change in the number of low-income students who complete four-year college in Virginia within six years relative to the status quo. To determine the effectiveness of each alternative, I estimate the impact of each proposed alternative on the number of in-state, low-income students who graduate from four-year public institutions in Virginia over the future 10-year period from 2022-2031. I compare each alternative to the status quo. Total costs include funding for the program, as well as administrative costs associated with implementation. The costs and outcomes are discounted at a rate of 3% per Office of Management and Budget (OMB) guidelines (*Circular*, 2003) to determine a net present value (NPV). The cost-effectiveness measurement for each alternative provides an estimate of the cost, in dollars, for each additional low-income four-year college graduate. A lower cost-effectiveness ratio means that the alternative has a lower cost for each additional low-income graduate. Due to efficiency considerations and budget limitations, a lower cost-effectiveness ratio is more desirable. Given the importance of cost-effectiveness, it receives a 40% weight in the analysis.

Political Feasibility

In evaluating political feasibility, I examine the likelihood that an alternative will have the necessary political support from key stakeholders in Virginia's higher education system to become enacted. I will base the political feasibility ranking on an analysis of key stakeholders, such as the Governor, SCHEV, and state legislators, and consider the success of similar initiatives in the recent past. I rank political feasibility on a scale of high, medium, and low. A high political feasibility ranking means that the alternative would likely receive widespread, bipartisan political support. A medium ranking signifies that there is some political opposition to the policy alternative. Finally, a low ranking means there is significant political opposition to the

policy alternative, making its adoption highly unlikely. Political feasibility has a 30% weight in the analysis.

Equity

The proposed alternatives seek to improve the graduation rates of low-income students relative to all other students by offering additional funding to support low-income students in completing their undergraduate studies. Equity is ranked from high to low. A high equity ranking indicates that an alternative provides the most additional funding for low-income students. A low ranking means that an alternative provides the least amount of additional funding for low-income students. A medium ranking means that an alternative provides a moderate level of funding relative to the other alternatives. Equity receives a 10% weight in the analysis.

Ability to Implement

The ability to implement refers to the level of difficulty associated with executing an alternative policy. A variety of factors impact the ability to implement an alternative. This criterion considers whether an alternative policy modifies existing programs and policies or establishes brand new programs and policies. This criterion also evaluates the technological requirements for alternatives. Additionally, this criterion accounts for the level of bureaucratic involvement associated with implementing each alternative, such as necessary involvement from SCHEV and the Department of Education. I rank the ability to implement policy alternatives on a scale of high, medium, and low. A high ranking means that the alternative is relatively easy to implement, whereas a low ranking means that the alternative policy is difficult to implement. Ability to implement receives a 20% weight in the analysis.

Alternatives

This section examines five policy alternatives to increase the four-year college graduation rate of low-income students. These policy alternatives are based on the academic literature, best practices and policies in other states, and successful programs at postsecondary institutions.

1. Status Quo

Under this alternative, current policies regarding higher education funding and support to low-income students in Virginia would continue. This alternative freezes all rules and policies effective December 2020. Under this policy, current trends in state appropriations for postsecondary education and trends in the cost of tuition and fees would continue. SCHEV would continue its current state financial aid programs for college students.

2. Completion Grant Program

Establishing a state-level completion grant program would provide an opportunity for institutions in Virginia to support college graduation among low-income students. This policy alternative draws on the state-funded emergency grant program in Minnesota. As previously mentioned, Minnesota has a state-level emergency grant program, EAPS, to support low-income students (*Emergency Assistance*, n.d.). The Office of Higher Education runs the program, and postsecondary institutions serving a high population of low-income students can apply for funding (*Emergency Assistance*, n.d.).

This policy alternative would entail creating a new state-level financial aid program in Virginia. The Virginia General Assembly would need to create this new grant program for public universities, modeled after the Minnesota program. Funds for this program would come from the general fund appropriations. SCHEV would then oversee the program and administer funds to each four-year public university based on the number of low-income students enrolled. Universities would then disperse completion grants to eligible students. Students could use these grants for a variety of purposes, such as for housing, transportation, technology, and medical expenses. This would also entail that colleges and universities create operational processes within their respective financial aid offices to distribute the funds to low-income students facing unexpected financial hardships.

In 2018, there were approximately 38,000 low-income, in-state undergraduate students at four-year public universities in Virginia (*Low Income and Potentially*, n.d.). I assume that in a given year, about 25% of low-income students will experience an unexpected financial hardship or emergency. I also assume that of these students, about 50% would apply for an emergency completion grant (about 4,750 students). The average completion grant award in Minnesota was about \$600, and the maximum award was \$1,000 (DeSalvo, 2020). The maximum completion grant under this alternative would be \$1,000, and, based on the Minnesota program, I assume that the average award amount would also be around \$600. Therefore, the General Assembly would need to appropriate \$2.85 million from the general fund each year for completion grants.

3. Outcomes-Based Funding Model

Virginia could institute an OBF model for four-year public institutions with additional weight placed on low-income and underrepresented student graduates. An OBF policy with equity weights allows states to incentivize higher education institutions to improve the outcomes of underrepresented student populations (National Commission on Financing 21st Century Higher Education, 2016).

This policy alternative is based on the Oregon OBF model. Virginia could implement a similar OBF model that emphasizes completion and includes an additional weight for low-income and underrepresented graduates. Under this alternative, the General Assembly would amend the Virginia Higher Education Opportunity Act of 2011 to institute an OBF model. This alternative would allocate 30% of funding based on college completion. The model would allocate an additional \$2,000 per low-income graduate, an additional \$2,000 for racial and ethnic minority graduates, and an additional \$2,000 for graduates who are first-generation college students. If a graduate belongs to more than one of these groups (low-income, racial or ethnic minority, or first-generation), the school will receive an additional \$3,000 in funding. This model would use current resources (*Strategic Finance*, 2019) and would reallocate funding from the existing general fund appropriations for higher education.

4. Data-Driven Advising

Virginia could establish a new grant program to support data-driven student advising. This alternative draws on the example of Georgia State University and would establish a grant program to provide public universities with funds to establish similar data-driven student support and advising services that incorporate predictive analytics.

The Virginia General Assembly would create a new grant program to support data-driven student support and advising services at public four-year institutions of higher education. Funding for this grant program would come from general fund appropriations. This grant program would focus specifically on supporting data-driven student support and advising programs for closing graduation gaps for underrepresented students. Each four-year public higher education institution in Virginia would receive a grant to support the implementation of an advising program.

The costs to implement the data-driven advising program at Georgia State University included the costs and fees for digital student advising platforms and the cost to hire more advisors (Bailey et al., 2019). I assume that each four-year public university in Virginia would hire approximately one additional advisor for every 100 low-income students. Therefore, the 15 four-year public institutions in Virginia would need to hire about 380 additional advisors in total. Additionally, each school would need to purchase additional technological equipment, such as computers for the new advisors and a license for a digital advising platform. The General Assembly would need to appropriate, on average, approximately \$30.5 million each year to fund this alternative.

Findings

In this section, I evaluate the four proposed policy alternatives against the criteria of *cost-effectiveness, political feasibility, equity, and ability to implement*.

Data & Methodology

Cost-Effectiveness Analysis

The baseline outcome for this analysis is the number of in-state, low-income students who will graduate from four-year public colleges and universities in Virginia over the next 10 years. To project this outcome, I first estimated the number of in-state undergraduates who will enroll in four-year public institutions over the next 10 years. I used historical data on in-state student enrollment at four-year public institutions and future population projections from the Weldon Cooper Center for the 20-24 age cohort to determine total in-state enrollment. Then I estimated the number of in-state, low-income students enrolled at four-year institutions using projections based on the historical rate of low-income student enrollment at four-year public institutions. Finally, I estimated the number of in-state, low-income graduates at four-year institutions over the next 10 years. To do this, I divided the projected low-income enrollment in each future year by four to estimate the number of low-income students in each year of college (freshman, junior, sophomore, senior). Then I applied a projection of the six-year graduation rate for low-income students to this enrollment value to find the number of low-income graduates each year over the next 10-year period. The projected outcomes for each alternative are a change relative to the baseline (status quo) outcome. The outcome for each alternative represents how the alternative policy would affect the number of low-income, in-state graduates compared to the status quo.

The base period costs are total E&G spending on in-state, low-income students at all public four-year higher education institutions in Virginia. To estimate the baseline costs, I used data on the average E&G expenditure per FTE student at four-year public institutions. I assume that E&G spending remains constant over the future 10-year period. However, I adjusted the costs each year to account for inflation using the Commonfund Higher Education Price Index of 2.2%

(*Higher Education Price Index*, 2020). I multiplied this value by the projected annual low-income student enrollment to determine the total E&G cost for low-income, in-state students each year. I discounted the projected cost and outcomes at a rate of 3% per OMB guidelines (*Circular*, 2003) to determine the NPV. Please see Appendix B for a detailed description of the assumptions and estimates used to calculate the costs and outcomes for each alternative.

Evaluation of Alternatives

1. Status Quo

Cost-Effectiveness

I determined the cost-effectiveness of the status quo by estimating the E&G spending on in-state, low-income students at four-year public institutions in Virginia over the future 10-year period. I estimated that the NPV of the cost to educate low-income students is \$9,606,419,944, and over this period, and the NPV for low-income graduates is 65,700. This provides a cost-effectiveness ratio of about \$146,000 per additional low-income graduate.

Political Feasibility

The political feasibility of the status quo is high, given that this alternative does not seek to enact any new higher education programs or policies. The status quo does not require any additional political support from the Governor, SCHEV, or state legislators.

Equity

The equity of the status quo is low because it does not take any additional measures to improve the graduation rates of low-income students relative to all other students. Under this alternative, current state-level financial aid programs would continue to support low-income students pursuing higher education.

Ability to Implement

Given that this alternative is the status quo, it does not propose any new higher education programs or policies, so the ability to implement is high. There is no legislative or regulatory change associated with the status quo, nor does this alternative require any additional bureaucratic involvement.

2. Completion Grant Program

Cost-Effectiveness

To determine the cost of this alternative, I estimate the total value of such a grant program and the administrative costs associated with implementation. As previously mentioned, I assume that about 4,750 students will apply for completion grants each year and that the average award will be around \$600. Therefore, the General Assembly would appropriate \$2.85 million annually to fund this grant program. Additionally, there are administrative costs associated with disbursing grant funds to students. Over the next ten years, I estimate that the NPV of the cost to educate low-income undergraduates under this alternative is \$9,635,188,054.

I base my estimates of the impact of a completion grant program on the results from the VCU completion grant programs. As previously mentioned, the completion grant program at VCU was associated with a 2 percentage point increase in the six-year graduation rate five years after the

program was implemented (*Foiling*, n.d.). While the program at VCU is not directly comparable to the proposed alternative, this school is located in Virginia and offers some of the more conservative outcome estimates. Based on the results from VCU, I make a conservative assumption that, during the first four years, a completion grant program would result in a 1 percentage point annual increase in the graduation rate for low-income students relative to the status quo. Starting in the fifth year, I assume that a completion grant program would result in an annual 2 percentage point annual increase in the graduation rate for low-income students compared to the status quo. Over 10 years with a completion grant program in effect, I estimate the NPV of low-income graduates is 67,355. Thus, this alternative has an estimated cost-effectiveness ratio of about \$143,000.

Political Feasibility

The political feasibility of a completion grant program is medium. One of SCHEV's new higher education goals concerns equity, specifically closing completion gaps for underrepresented students, including low-income students (*The Virginia*, 2021). Additionally, Governor Northam has also been supportive of higher education spending. For instance, in December 2020, Governor Northam proposed budget amendments that included over \$100 million in additional funding for higher education, and a significant portion of that funding was meant for financial aid (*Governor Northam's*, 2021).

A completion grant program would require legislative action from the General Assembly to authorize and fund the program. The Virginia Senate and House of Delegates are both currently controlled by Democrats. Democrats also chair the higher education subcommittees in the Virginia House of Delegates (*House*, n.d.) and Senate (*Education*, n.d.). Additionally, the Virginia House of Delegates and Senate recently passed a bill to expand financial aid access to undocumented students (*HB 2123*, n.d.). The passage of this legislation indicates that there may be legislative support for other initiatives to provide financial aid to underrepresented students. However, the Senate narrowly passed this legislation by a margin of two votes (*Commonwealth*, 2021; *HB 2123*, n.d.) along party lines (Republicans opposed and Democrats supported the legislation) (*Commonwealth*, 2021). A lack of bipartisan support for expanding access to financial aid programs indicates that establishing a new financial aid program, such as a completion grant program, would likely also lack bipartisan support. However, since there is a Democratic majority in both the House of Delegates and the Senate, I rank this alternative as a medium in terms of political feasibility.

Equity

A completion grant program specifically targets low-income students facing unexpected financial hardship. Compared to the other alternatives, a completion grant program provides a moderate amount of additional funding to support low-income students' college completion relative to all other students. This program does not provide additional funding to every low-income student since it only supports a subset of low-income students facing unanticipated financial difficulties. Therefore, a completion grant program receives a medium equity score.

Ability to Implement

The ability to implement a new completion grant program in Virginia is high. While this alternative entails administering a new state-level grant program for Virginia four-year public

institutions, it is relatively similar to current state-level grant programs. SCHEV would be involved in distributing the completion grants to each of the 15 public colleges and universities in Virginia. Since SCHEV has experience administering other institutional grants (*Fund*, n.d.), staff members have the necessary skills and knowledge of the grant management and distribution process. Additionally, individual colleges and universities would need to set up an application process to award completion grants to eligible low-income students. Colleges and universities have their own financial aid offices and have experience distributing financial aid, so staff members would also have the necessary skills and distribution mechanisms to disburse completion grants to eligible students.

3. Outcomes-Based Funding Model

Cost-Effectiveness

An OBF model would reallocate existing funding for higher education in Virginia. This alternative would provide an additional \$2,000 in funding to public four-year institutions for each low-income graduate. As previously mentioned, Li (2019) found that under equity weight policies, colleges and universities tended to provide additional programs and support services to help underrepresented students succeed. While this alternative does not change the total amount of higher education funding in Virginia, it would increase funding for low-income students. Based on the research from Li (2019), I assume that an OBF model with equity weights for low-income students would incentivize colleges and universities to spend more on support programs for low-income students. However, I also assume that the additional funding for low-income students under this alternative would result in a net-zero cost to educate low-income students (additional institutional spending on low-income students would equal the additional state funding). I estimate that the NPV of the cost to educate low-income students is the same as the status quo, at \$9,606,419,944.

To determine the effect of an OBF model on the number of low-income graduates, I base my assumptions on research by Tandberg and Hillman (2014). Tandberg and Hillman (2014) found that OBF models had a small statistically significant effect on degree completion that became evident seven years after the policy was implemented. Based on this research, I assume that the OBF model will not affect the number of low-income graduates in Virginia until the seventh year of the program. Since this OBF model ties a significant amount of state higher education funding to performance outcomes and includes additional equity weights for low-income students, I make a conservative estimate that this alternative would improve low-income students' graduation rates by 1 percentage point each year, starting in year seven. The NPV of low-income graduates in this scenario is 66,117. Thus, the alternative has a cost-effectiveness ratio of about \$145,00.

Political Feasibility

The political feasibility of an OBF model is medium. This alternative requires a high degree of legislative change, but it does not require additional appropriations. The General Assembly would need to amend the Virginia Higher Education Opportunity Act of 2011 to institute this new funding model. Since the General Assembly is controlled by Democrats, an OBF model has a higher probability of being enacted, even without full bipartisan support. As previously stated, one of SCHEV's higher education goals is to close completion gaps for low-income students (*The Virginia*, 2021). This policy would support that goal because it provides a financial

incentive for higher education institutions to support low-income students on the path to graduation (National Commission on Financing 21st Century Higher Education, 2016).

Equity

The equity of an OBF model is high. This policy provides incentives specifically to increase the graduation rates of low-income students through equity weights. This alternative would allocate an additional \$2,000 in funding to colleges and universities for each low-income graduate, which would improve equity.

Ability to Implement

The ability to implement an OBF model is medium. This alternative modifies the existing higher education funding model in Virginia. Staff at SCHEV would be involved in collecting extensive data from each of the public colleges and universities and determine the appropriate funding allocation based on a funding formula. SCHEV would also need to coordinate with the General Assembly to deliver its findings. Then, based on SCHEV's findings, the General Assembly would appropriate the correct amount of funds to each institution using the OBF model. This alternative has a higher level of bureaucratic involvement because it involves coordination between the General Assembly, SCHEV, and all public four-year colleges and universities in Virginia.

4. Data-Driven Advising

Cost-Effectiveness

I base the cost of a state-wide data-driven advising initiative on the costs associated with the data-driven advising program at Georgia State University. The cost of the program at Georgia State University included the fees for digital student advising platforms and the cost to hire more advisors (Bailey et al., 2019). I assume that the four-year public institutions in Virginia would need to hire about 380 additional advisors in total. Furthermore, each school would incur additional technology costs to implement a data-driven advising program. I estimate that the NPV of the cost to educate low-income students under this alternative is \$9,866,782,430.

Georgia State University's six-year graduation rate increased by 22 percentage points over 11 years as the university used data-driven advising and other student support initiatives (*Higher Education Transformation*, 2015). Since other factors may impact the graduation rate (Bailey et al., 2019), I also look to the research on student advising. Bettinger and Baker (2014) found that coaching increased students' graduation rates by 4 percentage points. Based on these results, I make a conservative assumption that data-driven advising would result in a 2 percentage point annual increase in graduation rates for low-income students. I also assume that the effect on graduation rates would not be immediate. In the first three years, I assume that the program would not yet have an effect on the graduation rate of low-income students. Four years after implementation, the program would have the full 2 percentage point effect on graduation rates, as this is when the first cohort of students who experienced four full years of the advising program would begin to graduate. The NPV of low-income graduates for this alternative is \$67,152. The data-driven advising alternative has a cost-effectiveness ratio of about \$147,000.

Political Feasibility

Similar to the completion grant program, the political feasibility of this alternative is medium. This program is aligned with SCHEV's goal to close the completion gap for underrepresented students, as outlined in the 2021 Virginia Plan for Higher Education (*The Virginia*, 2021). Although Governor Northam has supported higher education spending (*Governor Northam's*, 2021), there may not be bipartisan support in the General Assembly for the creation of a new financial aid grant program. However, given the Democratic majority in the House of Delegates and the Senate, this alternative could pass even without Republican support.

Equity

The equity score for a data-driven advising program is high. A data-driven advising program would be available to all low-income students, not just a subset of these students. This alternative also involves a high level of additional funding to support low-income students relative to all other students, making it highly equitable.

Ability to Implement

The ability to implement a data-driven student advising program at Virginia four-year public institutions is ranked low. The General Assembly would directly allocate funds to each of the fifteen public higher education institutions in Virginia, which would not require any additional bureaucratic involvement from SCHEV or other state agencies. However, this alternative relies heavily on technology, specifically virtual data-driven advising platforms. This alternative would require that each of the 15 public colleges and universities sets up a third-party virtual advising platform. Additionally, hundreds of college advisors across all public institutions would need to receive specialized training in using the platform to manage student data and track student progress. Furthermore, a data-driven advising program would require a high level of buy-in from all four-year public institutions, as well as the student advising staff.

Outcomes Matrix

I assigned numeric values to the political feasibility, equity, and ability to implement criteria in order to establish an overall score that accounts for the relative weight of each criterion. A high score equates to 1, a medium equates to 2, and a low score equates to 3. The alternative with the lowest overall score is the best. See Appendix D for an explanation of the overall score calculation.

Table 3: Outcomes Matrix

Alternatives	Evaluative Criteria				
	Cost-Effectiveness (cost per low-income graduate) (40%)	Political Feasibility (30%)	Equity (10%)	Ability to Implement (20%)	Overall Score
1. Status Quo	\$146,216	High (1)	Low (3)	High (1)	58,487
2. Completion Grant Program	\$143,051	Medium (2)	Medium (2)	High (1)	57,221
3. Outcomes-Based Funding Model	\$145,295	Medium (2)	High (1)	Medium (2)	58,119
4. Data-Driven Advising	\$146,932	Medium (2)	High (1)	Low (3)	58,774

Recommendation

Table 3 provides a summary of the evaluation of each alternative against the criteria. Based on the results of the outcomes matrix, the completion grant program has the best overall score. The completion grant program has the lowest cost-effectiveness ratio out of all the alternatives and has a high ability to implement rating. The completion grant program has some tradeoffs in terms of equity and political feasibility. The completion grant program received a medium score for equity since this alternative provides a moderate level of additional funding to support low-income students' graduation rates. The political feasibility ranking for this alternative is medium because it is unlikely to receive bipartisan support in the General Assembly. However, given the Democratic majority in the House of Delegates and the Senate, legislation to establish a completion grant program could still pass in the General Assembly, even without bipartisan support. Despite the political feasibility hurdle, the General Assembly has created new grant programs before, and SCHEV has experience administering grants to institutions (*Fund*, n.d.).

Implementation: Completion Grant Program

Implementation of a completion grant program in Virginia will require coordination between SCHEV and the 15 four-year public colleges and universities in Virginia. The following section describes stakeholders involved in implementing this grant program, perspectives of stakeholders impacted by the program, and considers a possible worst-case scenario.

Stakeholder Involvement

SCHEV will be responsible for administering the completion grant program and distributing funds to each of the 15 four-year public higher education institutions in Virginia. SCHEV will distribute funds based on the proportion of low-income students enrolled at each institution and create a distribution formula to allocate funds among the institutions. SCHEV will also need to implement a data collection process to ensure that grant administration staff have timely information on the low-income student enrollment numbers at each institution. Once SCHEV staff determine the grant allocations, they will need to communicate this with the financial aid offices at each of the four-year public colleges and universities and distribute the grant awards to each institution.

The financial aid offices at each college and university will need to set up a completion grant application on their websites. Following the Minnesota program framework, universities will need to confirm the applicants' income eligibility (DeSalvo, 2020). Financial aid officers at each school will evaluate the completion grant applications, determine the award amount, and distribute awards directly to students. Colleges and universities will also need to develop communication strategies to ensure that students are aware of the completion grant program at their school (*Foiling*, n.d.)

Stakeholder Perspectives

The primary stakeholders that will be affected by a state-level completion grant program are four-year public colleges and universities, financial aid officers, and low-income students eligible for the grants. Both the colleges and universities and low-income students should support this program since they will likely benefit from it. National college and university rankings are largely based on graduation rates (Morse & Brooks, 2020). This grant program should help four-year colleges and universities in Virginia improve their graduation outcomes for low-income students, which may improve their overall rankings. Furthermore, low-income students in Virginia will benefit from additional financial aid resources.

Financial aid officers will be in charge of administering individual grants to students. Financial aid officers will likely support completion grants, but they may also be resistant to administering a new financial aid program. Therefore, SCHEV will need to provide guidance to financial aid offices in setting up their completion grant programs and communicate the benefits of this program for low-income student success.

Worst-Case Scenario

One of the primary risks to the successful implementation of a completion grant program would be cuts to state E&G support funding for higher education. E&G support includes funding for student services at colleges and universities (*Higher Education Funding*, 2020), such as financial

aid offices and staff. In a worst-case scenario, budget cuts may result in colleges and universities reducing the number of financial aid officers or cutting their hours. This would limit the staffing resources dedicated to administering completion grant programs at colleges and universities. As a result, it may take financial aid offices more time to process student applications for completion grants. Since completion grants are intended for emergencies, requests may be time-sensitive, and longer application processing times may negatively impact the effectiveness of the program.

In conclusion, the successful implementation of a state-level completion grant program will involve coordination between SCHEV and public four-year colleges and universities. Financial aid offices and staff at each college and university will be instrumental in administering grants to individual students. Therefore, SCHEV should provide guidance and support to institutional financial aid offices to help set up administrative processes to distribute completion grants to students.

Appendix A: Cost to Society Explanation

The cost to society calculations are based on the following assumptions.

During the fall of 2018, there were a total of about 38,000 low-income, in-state undergraduate students at Virginia public four-year colleges (*Low Income and Potentially*, n.d.).

Assuming that each cohort had an equal number of low-income students, there would be approximately 9,500 low-income students per graduating class.

$$\rightarrow 38,000/4 = 9,500$$

Assuming a 61% six-year graduation rate for low-income students would mean that a total of about 5,800 low-income students from the class of 2018 graduated, and 3,700 low-income students did not graduate.

$$\rightarrow 9,500 * 0.61 = \text{about } 5,800 \text{ students who graduated}$$

$$\rightarrow 9,500 - 5,800 = 3,700 \text{ students who did not graduate}$$

Direct Costs

Public Assistance Programs

$$\$24,000 * 3,700 \text{ students} = \$88,800,000$$

Unemployment Insurance

$$\$2,000 * 3,700 \text{ students} = \$7,400,000$$

$$\text{Total direct costs: } \$88,800,000 + \$7,400,000 = \$96,200,000$$

Opportunity Costs

Life Expectancy

To account for the difference in life expectancy between workers based on educational attainment, I assume that workers with only some college education work for about 35 years and workers with a bachelor's degree work for 40 years.

Range of lost lifetime earnings for an individual college drop-out over a 35-year career plus the lost income from working 5 fewer years.

$$\$24,600 * 40 = \$984,000$$

$$\$33,000 * 40 = \$1,320,000$$

Range of total lost lifetime income for the entire cohort.

$$\$984,000 * 3,700 \text{ students} = \$3,640,800,000$$

$$\$1,320,000 * 3,700 \text{ students} = \$4,884,000,000$$

Total cost to society (range)

Direct costs + opportunity costs = total cost to society

$$\$96,200,000 + \$3,640,800,000 = \$3,737,000,000$$

$$\$96,200,000 + \$4,884,000,000 = \$4,980,200,000$$

Appendix B: Cost-Effectiveness Analysis

Table A1: General Assumptions

Inflation Rate for Higher Education	2.2%	<i>Higher Education Price Index, 2020</i>
Discount Rate	3.0%	<i>Circular, 2003</i>

Baseline/Status Quo

Outcome

I used future population projections to estimate the population (age 20-24) over the next 10 years. The projected population for the 20-24 age group in Virginia in 2020 is 562,798, and in 2030 the projected population is 613,316 (*University of Virginia, 2019*). I assumed that the population would increase by 4,593 annually.³

I estimated the percentage of the state population enrolled in a four-year public college, assuming that college enrollment is primarily composed of the 20-24 age group (see Table A2). Using historical census population estimates from *Population Estimates*, n.d. and data on college enrollment from *Low Income and Potentially*, n.d., I estimated the percentage of the state population (age 20-24) enrolled in a four-year public college from 2011-2018. I assumed that the percentage of the population enrolled in college will increase by 0.21 percentage points each year in the future.⁴ Next, I projected the total number of in-state undergraduates enrolled in four-year public institutions using the estimated percentage of the state population enrolled in college and the population projections (see Table A2).

Table A2: Projected Undergraduate Enrollment (Four-Year, Public, In-State)

Year	% Total Enrollment of State Population (ages 20-24)	Total Number of Students Enrolled
2021	25.07%	142,250
2022	25.28%	144,621
2023	25.50%	147,011
2024	25.71%	149,421
2025	25.92%	151,850
2026	26.14%	154,299
2027	26.35%	156,767
2028	26.56%	159,255
2029	26.78%	161,763
2030	26.99%	164,290
2031	27.20%	166,837

*Assuming college enrollment is primarily comprised of 20-24 age group

³ Author's estimates using data from *University of Virginia, 2019*. Based on average annual increase in population from population projections between 2020-2030.

⁴ Author's estimates using data from *Population Estimates*, n.d. and *Low Income and Potentially*, n.d. Based on average increase in the percentage of the state population enrolled in four-year public college between 2011-2018, assuming age group 20-24 comprises total enrollment.

I also projected the percentage of low-income, in-state student enrollment at four-year public colleges in Virginia (see Table A3). I assume that the percentage of low-income student enrollment will increase by 0.53 percentage points each year.⁵ Then I multiplied the estimated percentage of low-income student enrollment by the total number of students enrolled in college to determine the low-income student enrollment in each future year (see Table A3).

Table A3: Projected Low-Income Student Enrollment (Four-Year, Public, In-State)

Year	% Low-Income Student Enrollment	Low-Income Students Enrolled
2021	28.38%	40,364
2022	28.90%	41,798
2023	29.43%	43,262
2024	29.95%	44,757
2025	30.48%	46,284
2026	31.01%	47,842
2027	31.53%	49,432
2028	32.06%	51,055
2029	32.58%	52,710
2030	33.11%	54,398
2031	33.64%	56,119

⁵ Author's estimate based on average increase in enrollment from 2004-2018 using data from *Low Income and Potentially*, n.d.

I projected the six-year graduation rate of low-income students over the 10 years (see Table A4). I assume that the graduation rate for low-income students increases by 0.25 percentage points each year.⁶

Table A4: Projected Six-Year Graduation Rate for Low-Income Students

Year (Cohort, Year Entering School)	Year of Corresponding Grad Rate (Six Years Later)	Low-income Grad Rate (Six-Year, In-State, Completed Anywhere)
2016	2022	62.55%
2017	2023	62.80%
2018	2024	63.05%
2019	2025	63.30%
2020	2026	63.55%
2021	2027	63.80%
2022	2028	64.05%
2023	2029	64.30%
2024	2030	64.55%
2025	2031	64.80%

To estimate the number of low-income graduates over the next 10 years (see Table A5), I divided the number of low-income students enrolled each year by four to estimate the number of low-income students in each cohort (freshman, juniors, sophomores, and seniors). Then I multiplied this value by the estimated low-income student graduation rate for the corresponding year to determine the number of low-income graduates.

Table A5: Projected Number of Low-Income Graduates

Year	Number of Graduates
2022	6,536
2023	6,792
2024	7,055
2025	7,324
2026	7,601
2027	7,884
2028	8,175
2029	8,473
2030	8,778
2031	9,091

⁶ Author's estimates using data from *GR-SC01*, n.d. Based on average increase in the six-year graduation rate (four-year public institutions) for low-income, in-state students from 1995-2011.

Cost

Per FTE, E&G spending at four-year public institutions in Virginia was \$19,723 in 2019 (*Higher Education Funding*, 2020). Adjusting for inflation using a rate of 2.2% yields the per FTE costs over the future 10-year period. I multiplied the per FTE spending by the projected number of low-income undergraduates enrolled over the next 10 years to determine the total cost to educate low-income students.

Cost-Effectiveness Analysis

The cost-effectiveness analysis for the status quo is provided in Table A7 below.

Table A7: Status Quo Cost-Effectiveness Analysis

Year	Cost	Number of Low-Income Graduates
2022	\$ 879,987,861	6,536
2023	\$ 930,855,128	6,792
2024	\$ 984,216,719	7,055
2025	\$ 1,040,179,715	7,324
2026	\$ 1,098,855,339	7,601
2027	\$ 1,160,359,100	7,884
2028	\$ 1,224,810,947	8,175
2029	\$ 1,292,335,429	8,473
2030	\$ 1,363,061,856	8,778
2031	\$ 1,437,124,466	9,091
NPV	\$ 9,606,419,944	65,700
Cost-Effectiveness Ratio	\$ 146,216	

Completion Grant Program

Outcome

I assume that during the first four years, a completion grant program would result in a 1 percentage point annual increase in the graduation rate for low-income students relative to the status quo. Starting in the fifth year, I assume that a completion grant program would result in an annual 2 percentage point annual increase in the graduation rate for low-income students relative to the status quo.

Costs

I assume that in a given year, about 4,750 students will apply for a completion grant. The average grant award in the Minnesota program was \$600 (DeSalvo, 2020). I assume that the average award in Virginia will also be \$600. Therefore, the total value of the grants is \$2.85 million each year.

→ $4,750 \text{ students} \times \$600 \text{ average grant} = \2.85 million

I assume that the distribution of each grant takes approximately five hours. Based on salary information from ZipRecruiter.com, the estimated salary for financial aid managers in Virginia is \$22 per hour (*Financial Aid Manager*, 2021).

Therefore, the total annual administrative cost is about \$522,500 each year.

→ $(\$22 \times 5 \text{ hours}) \times 4,750 \text{ grants} = \$522,500$

Cost-Effectiveness Analysis

The cost-effectiveness analysis for the completion grant program is provided in Table A8 below.

Table A8: Completion Grant Program Cost-Effectiveness Analysis

Year	Cost	Number of Low-Income Graduates
2022	\$ 883,360,361	6,641
2023	\$ 934,227,628	6,900
2024	\$ 987,589,219	7,167
2025	\$ 1,043,552,215	7,440
2026	\$ 1,102,227,839	7,840
2027	\$ 1,163,731,600	8,132
2028	\$ 1,228,183,447	8,430
2029	\$ 1,295,707,929	8,737
2030	\$ 1,366,434,356	9,050
2031	\$ 1,440,496,966	9,372
NPV	\$ 9,635,188,054	67,355
Cost-Effectiveness Ratio	\$ 143,051	

Outcomes-Based Funding Model

Outcome

I assume that OBF would improve low-income students' graduation rates by 1 percentage point per year, relative to the status quo, starting in year seven.

Cost

I assume that the total cost for OBF is the same as the baseline/status quo cost.

Cost-Effectiveness Analysis

The cost-effectiveness analysis for the OBF model is provided in Table A9 below.

Table A9: Outcomes-Based Funding Model Cost-Effectiveness Analysis

Year	Cost	Number of Low-Income Graduates
2022	\$ 879,987,861	6,536
2023	\$ 930,855,128	6,792
2024	\$ 984,216,719	7,055
2025	\$ 1,040,179,715	7,324
2026	\$ 1,098,855,339	7,601
2027	\$ 1,160,359,100	7,884
2028	\$ 1,224,810,947	8,303
2029	\$ 1,292,335,429	8,605
2030	\$ 1,363,061,856	8,914
2031	\$ 1,437,124,466	9,232
NPV	\$ 9,606,419,944	66,117
Cost-Effectiveness Ratio	\$ 145,295	

Data-Driven Advising

Outcome

I assume that data-driven advising would have a 2 percentage point effect on low-income students' graduation rates, beginning in the fourth year of the program.

Cost

I assume that four-year public universities in Virginia would hire about 380 additional advisors in total. Based on salary data from Salary.com, the average academic advisor makes approximately \$50,000 per year (\$25 per hour) (*Academic Advisor*, 2021). This results in additional labor costs of \$19 million per year ($380 \text{ new advisors} \times \$50,000 = \$19 \text{ million}$).

I also include the benefits that these advisors receive. I assume that benefits account for 34% of total compensation, based on employee compensation information for the junior college, colleges, and universities industry group from the Bureau of Labor Statistics (*Employer Costs*, 2021). I estimated the benefit value using the following calculations:

$x = \text{total compensation}$

$$\$50,000 + 0.34 \times x = x$$

$$\$50,000 = 0.66 \times x$$

$$x = \$75,758 \rightarrow \text{Benefit value: } \$75,758 \times 0.34 = \$25,758$$

To estimate the total annual benefit value, I multiply this value by the number of new advisors to determine a value of \$9,788,040.

I also calculate the approximate value of office space for the new advisors. The size of a cubicle for each person is about 60 square feet (*Office Space*, n.d.). The average cost of office space in Virginia is \$36.62 per square foot (*Virginia Beach Office*, n.d.). Therefore, the total annual cost of office space is: $(60 \times \$36.62) \times 380 = \$834,936$

To calculate overhead costs for the new advisors, I assume that there are 15 additional hours of human resources/administrative work associated with each new advisor per year.

Based on salary information from Ziprecruiter.com, the average salary for a human resource associate in Virginia is about \$19 per hour (*Human Resources*, n.d.).

Therefore, the total annual overhead cost is: $(15 \times \$19) \times 380 = \$108,300$

These new advisors will also need laptops. Based on current market prices from (*Dell*, n.d.), I assume that the price of a laptop is approximately \$500. I also assume that laptops will need to be replaced about every three years. This results in a total technology cost of \$760,000 spread out over four increments.

$$\rightarrow (\$500 \text{ per laptop} \times 380 \text{ advisors}) \times 4 = 760,000$$

There are also costs associated with a virtual advising platform. Cost estimates from Laramie County Community College for the EAB advising platform indicate that the implementation cost for the platform is about \$67,000 (one-time cost in the first year), and the annual subscription fee is about \$146,000 (*Student Success*, n.d.). Since there are 15 public colleges and universities in Virginia, I scale up these costs by a factor of 15 to find the cost for Virginia.

$$\rightarrow \text{Implementation (one-time cost in first year): } \$67,000 \times 15 = \$1,005,000$$

$$\rightarrow \text{Annual subscription: } \$146,000 \times 15 = \$3,195,000$$

Cost-Effectiveness Analysis

The cost-effectiveness analysis for data-driven advising is provided in Table A10 below.

Table A10: Data-Driven Advising Cost-Effectiveness Analysis

Year	Cost	Number of Low-Income Graduates
2022	\$ 910,832,541	6,536
2023	\$ 961,230,871	6,792
2024	\$ 1,014,603,985	7,055
2025	\$ 1,070,768,504	7,556
2026	\$ 1,129,265,651	7,840
2027	\$ 1,190,780,935	8,132
2028	\$ 1,255,434,305	8,430
2029	\$ 1,322,780,310	8,737
2030	\$ 1,393,518,260	9,050
2031	\$ 1,467,782,393	9,372
NPV	\$ 9,866,782,430	67,152
Cost-Effectiveness Ratio	\$ 146,932	

Appendix C: Alternative Ranking Calculations

Alternatives Ranking Formula

$(\text{Cost-Effectiveness Ratio} \times 0.4) + (\text{Political Feasibility Score} \times 0.3) + (\text{Equity Score} \times 0.1) + (\text{Ability to Implement Score} \times 0.2) = \text{Overall Score}$

Status Quo

$(146,216 \times 0.4) + (1 \times 0.3) + (3 \times 0.1) + (1 \times 0.2) = 58,487.2$

Completion Grant Program

$(143,051 \times 0.4) + (2 \times 0.3) + (2 \times 0.1) + (1 \times 0.2) = 57,221.4$

Outcomes-Based Funding Model

$(145,295 \times 0.4) + (2 \times 0.3) + (1 \times 0.1) + (2 \times 0.2) = 58,119.1$

Data-Driven Advising

$(146,932 \times 0.4) + (2 \times 0.3) + (1 \times 0.1) + (3 \times 0.2) = 58,774.1$

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[tassels/?wpdmdl=6472357&refresh=604367f4b7f9d1615030260](https://success.gsu.edu/download/turning-more-tassels/?wpdmdl=6472357&refresh=604367f4b7f9d1615030260)

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