

Academic Portfolio Recommendations for the Transformation of the Vermont State Colleges System

May 2021

rpk GROUP
626C Admiral Drive, Suite 511
Annapolis, MD 21401

Table of Contents

- Executive Summary3
- Introduction and Background.....5
- Framing the Analysis6
- Results of the Analysis..... 11
- Engagement Across VSCS 23
- Recommendations: Summary 25
- Recommendations: Detailed 26
 - Agriculture, Plant and Animal Sciences 26
 - Athletic Training, Exercise and Health Sciences 28
 - Business/Accounting 30
 - Communications/Journalism..... 32
 - Computer Information Systems 34
 - Counseling and Psychology 35
 - Education..... 36
 - Engineering Technology 39
 - Fine and Performing Arts..... 41
 - Health Professions..... 43
 - Humanities 45
 - Math and Science 47
 - Professional Programs..... 49
 - Ski Resort Management/Outdoor Education and Adventure 50
 - Social Sciences 51
- Appendix A: Methodology..... 53

Executive Summary

Higher education is living through a moment of history as the recent pandemic accelerates long standing challenges from enrollment declines, reduced funding from governmental sources, price constraints and questions about the value of a college degree. The Vermont State Colleges System (VSCS or System) is not immune to those challenges. While much of higher education longs to return to a pre-pandemic “normal,” VSCS has chosen a bolder path toward service to students and employers, and the creation of a financially sustainable model. This groundbreaking effort is poised to become a national model for system transformation across the industry.

rpk GROUP (rpk) had the privilege of supporting the effort to evaluate the academic offerings across Castleton University (Castleton), Northern Vermont University (NVU), and Vermont Technical College (Vermont Tech). This effort was collaborative, involving the System office, the chief academic officers from Castleton, NVU, Vermont Tech, and Community College of Vermont (CCV), and multiple touch points with faculty. Together, a Program Evaluation Framework was created that imagines the three institutions of Castleton, NVU, and Vermont Tech as a *single institution*: combining the program offerings of each individual institution, rolling up programs where duplication exists, and presenting the analysis as a new path forward.

This vision of a unified institution seeks to solve for several problems facing the current academic portfolio at VSCS. That list includes:

- Declining enrollments – Enrollment declined 2.4% from 2016 to 2020.
- Small programs – Of the 74 rolled-up Bachelor’s programs, 46% have average annual enrollments under 30 students.
- Programs out of alignment with student demand and labor market needs – Seventeen programs scored very low in the labor market analysis, and thirteen have below median enrollment and below median growth.
- Teaching inefficiencies – Total student credit hours (SCH) per full time equivalent (FTE) faculty member declined from 299 in 2016 to 285 in 2020 – far below national benchmarking data. A 25% improvement on this metric would raise average faculty throughput to 356 student credit hours per faculty FTE, or an average class size of 15 students for faculty teaching eight course sections per year. This is still below an ideal average of 400 student credit hours per faculty FTE (average class sizes of 17), but even this modest improvement could result in significant savings for the institution.
- Financial unsustainability – The disconnect from student and employer demand, coupled with teaching inefficiencies, contributes to long term financial unsustainability for VSCS – particularly at a time when students and parents are challenged to support higher tuition prices.

In short, VSCS has spread its most valuable resource, its people, across too many programs, too many courses, too many sections. The Program Evaluation Framework attempts to reset the total academic portfolio to address the needs of all Vermonters within a financially sustainable model. This is accomplished by focusing the program mix on areas of strong student and employer demand, while respecting mission-based decisions of VSCS. In addition, the Framework seeks to create a critical mass of faculty and students within areas of focus, moving from many small programs to fewer but more robust programs. Overall, this approach should best support Vermont’s desire to sustainably move toward its ambitious but critical goal to achieve 70% attainment of a college completion by allowing Vermonters statewide access to the programs and opportunities they need.

The result of this effort to develop the ideal academic portfolio for a unified VSCS is an analysis of 126 rolled-up

degree programs framed around three potential paths forward: invest, optimize, or eliminate. For 83 of those programs (65%), **the recommendation is to optimize**. This should not come as a surprise. Optimization in this process is defined as reaching points of alignment between the program offerings within disciplines, building strong degree paths, and achieving overall better economies of scale as a result of the restructure. The reality of transforming three distinct institutions into a single accredited body will require myriad instances of optimization – both in academic offerings and, likely, administrative services.

The analysis further identifies academic program candidates for investment and for elimination. A total of 10 programs fall into the investment category, based largely upon program size and student and employer demand. Finally, 20 programs were identified for elimination, based on similar criteria. Those programs recommended for elimination enroll 117 students annually, reflecting 2% of average annual enrollments. Thirteen programs were launched within the timeframe of the analysis and were labeled in the analysis as ‘New Programs.’ These new programs did not receive a recommendation.

Three clear recommendations to VSCS emerge from the work:

1. VSCS should **adopt the Program Evaluation Framework** for portfolio evaluation and use this Framework to report on the portfolio’s health to the Board of Trustees annually. This recommendation could include an update to Policy 109 (Annual Enrollment and Cost Effectiveness Review of Existing Academic Programs).
2. VSCS leadership should move forward to **carry out the work of optimizing the academic portfolio** beginning in the Summer of 2021. This will allow VSCS to recruit a new class of students into the unified academic portfolio for Fall 2022. In pursuing optimization, VSCS should target a 25% improvement in student credit hours per faculty FTE.
3. VSCS leadership should review and **make final decisions on the recommendations for program investment and elimination**. That decision making could be further informed by the Summer 2021 optimization work.

VSCS and the State of Vermont have created a bold vision to serve all Vermonters. The path forward for VSCS is one that acknowledges strengths and builds upon them, identifies opportunities based on student/employer demand and invests in them, and moves away from programs that no longer serve students, the economy, or the mission of the newly unified institution.

Introduction and Background

rpk GROUP (rpk) was hired by the Vermont State Colleges System (VSCS) to enhance the academic portfolio and align the System with the transformation goals articulated by the Select Committee on the Future of Public Higher Education in Vermont (Select Committee). rpk began the project in January 2021, working alongside the Chief Academic Officers from CCV, Castleton, NVU, and Vermont Tech to develop a Program Evaluation Framework for the analysis, review analysis output, and engage stakeholders statewide.

The goals of the analysis of the academic portfolio were to:

1. Develop a framework for evaluation of current academic programs within the VSCS portfolio.
2. Identify gaps in the existing academic portfolio relative to Vermont labor market demand.
3. Recommend an ideal portfolio that meets the needs of Vermont students and the work force.
4. Design action plans to help VSCS implement the recommended academic portfolio.

The analysis created in support of these goals intentionally blended the academic portfolios of Castleton, NVU, and Vermont Tech, evaluating the portfolio as if it were for a *single institution*. This required creating units of analysis at the program level that eliminated the duplication of effort occurring across the System. For example, all three institutions offer a Bachelor's degree in Business Administration, so the analysis rolled-up the data from all three programs to represent a single degree in Business Administration. This process was also designed with a goal of replicability. Overall, the approach represents best practice in portfolio evaluation, and is something VSCS should adopt as a standard practice moving forward.

Capturing Castleton, NVU, and Vermont Tech as a single institution was a critical and necessary step to move VSCS toward its transformation goals. By consolidating the institutions in the analysis, rpk was able to determine the opportunities for increased efficiencies. In addition, the consolidated program analysis points toward areas of investment, optimization and elimination, allowing VSCS to streamline its academic portfolio and better align with student and employer demand.

VSCS is well positioned to build upon this Framework and the analysis. This includes a recommendation to engage faculty beginning in Summer 2021 as VSCS creates a more detailed action plan for achieving transformation. The additional engagement period should focus largely on the programs recommended for optimization, and the likely identification of additional opportunities for program consolidation.

Together, VSCS and rpk have achieved the goals established for this analysis, supporting the creation of a strong, healthy portfolio of academic programs. In the pages that follow, details are provided on the analysis approach, methodology, and results. Those program level results begin on page 26, capturing the recommendations for program investment, optimization, or elimination. The resulting academic portfolio should meet student demand, align with state labor market needs, deliver on student success, achieve financial sustainability, and be accessible to all Vermont students.

Framing the Analysis

A key project goal, and one of the critical steps in the analysis, was the creation of a Program Evaluation Framework. That Framework was created in partnership with VSCS senior leadership through the following steps:

1. Establishing a consolidated program list – This step consolidated over 200 separate program offerings across the three institutions into one, System-wide collection of 127 Associate, Bachelor's and Master's degree programs.
2. Grouping programs into areas of focus – This second step captured the 127 programs and allocated them to 15 areas of focus, based on discipline and market orientation.
3. Establishing Metrics for Evaluation – The heart of the Framework approach was the establishment of evaluation metrics, based on industry best practice and available data. The metrics reflect student and labor market demand, as well as student success.

Together, these steps resulted in a Framework allowing for recommendations on program investment, optimization and elimination. These steps are outlined in more detail below.

Establishing the Universe of Programs and a Unit of Analysis

The critical and challenging first step in this process was to establish the unit of analysis. Each of the three institutions in this analysis maintains their own academic catalog, and there are more than 200 Associate, Bachelor's, and Master's programs listed across those three catalogs. In addition, there is duplication of programs across the institutions that is not immediately identifiable by simply looking at the name of the program in the catalog. To streamline these offerings for the purpose of the analysis and to provide a structure to help understand how the three institutions would look if combined into one, rpk began by rolling up academic programs by their Classification of Instructional Programs or CIP¹ code and degree level to create a unique identifier that combined programs across and within institutions. Once this roll up was done, only 127 programs remained.

Creating Areas of Focus

The newly renamed programs were assigned to one of fifteen areas of focus. The goal of assigning programs to areas of focus was similar to that of the program roll up. Areas of focus allow for a larger unit of analysis by which to understand the concentrations of academic offerings when viewed as a single institution. Some of the areas of focus function similarly to a department in that they are good captures of the disciplines of the programs within (e.g. Business/Accounting). Others are more "catch all" and include a diversity of programs that are similar in ways other than discipline (e.g. Professional Programs). This assignment to area of focus was done in collaboration with the CAOs from Castleton, NVU and Vermont Tech.

The fifteen areas of focus are:

1. Agriculture, Plant and Animal Sciences
2. Athletic Training, Exercise and Health Sciences
3. Business/Accounting

¹ The Classification of Instructional Programs (CIP) provides a taxonomic scheme that supports the accurate tracking and reporting of fields of study and program completions activity. CIP was originally developed by the U.S. Department of Education's National Center for Education Statistics (NCES) in 1980, with revisions occurring in 1985, 1990, 2000, 2010 and 2020. Source: NCES

4. Communications/Journalism
5. Computer Information Systems
6. Counseling and Psychology
7. Education
8. Engineering Technology
9. Fine and Performing Arts
10. Health Professions
11. Humanities
12. Math and Science
13. Professional Programs
14. Ski Resort Management/Outdoor Education and Adventure
15. Social Sciences

Table 1 is an example of the program roll up and grouping within the Counseling and Psychology area of focus. This table demonstrates how the programs in the original program column were rolled-up to create the larger unit of analysis of the program roll-up. All of the programs grouped together have the same CIP code. For example, while the Bachelor’s degrees in psychology may seem different or distinct to the faculty at their respective campuses, the programs grouped as Psychology BA/BS share the same CIP code, which represents significant similarity.

Table 1: Sample Grouping by Area of Focus and Program Roll-Up

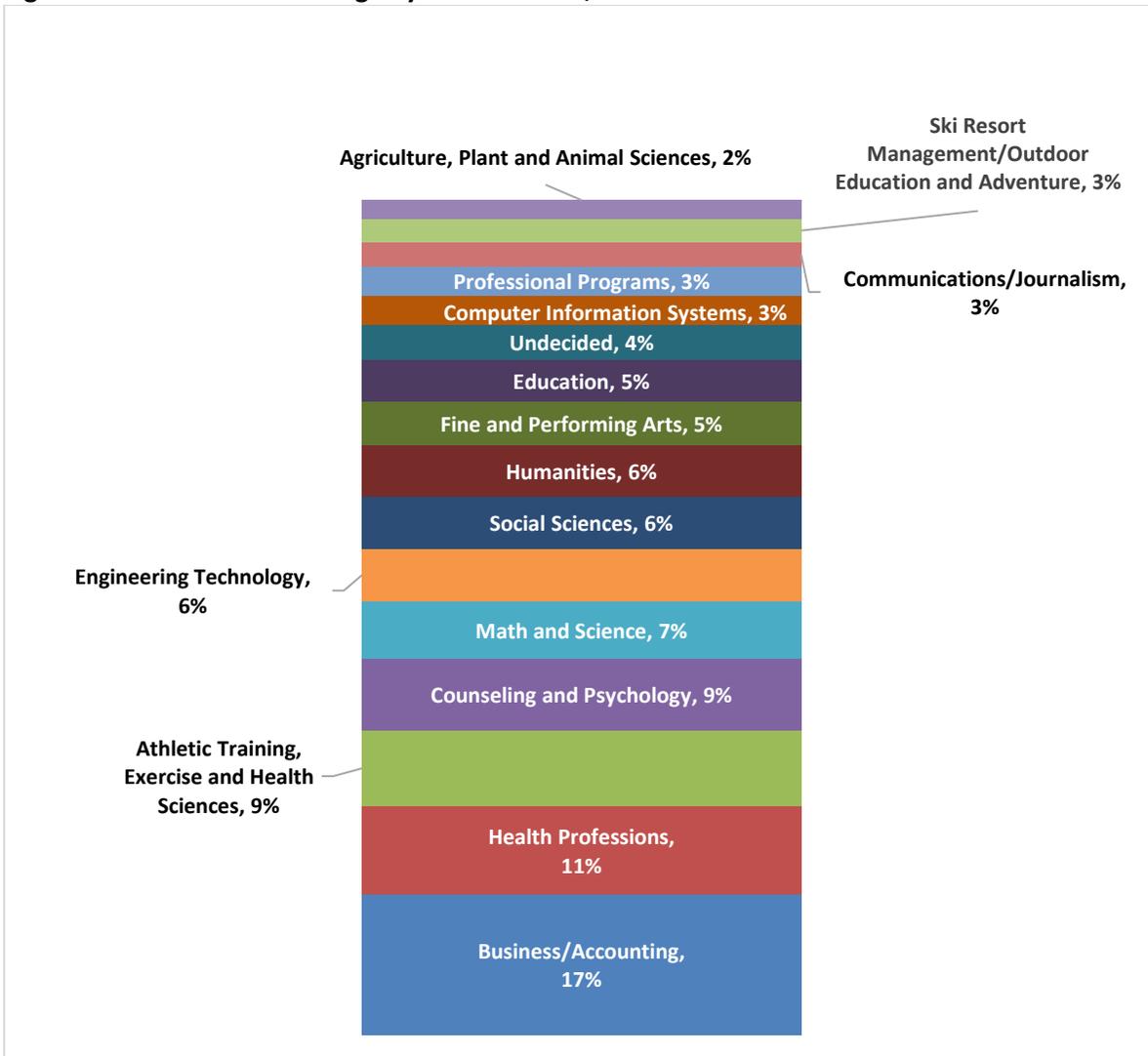
Focus Areas	Program Roll-Up	Original Program
Counseling and Psychology	CounselingMA	CU School Psychology (MA)
		NVU Counseling: Clinical Mental Health - Johnson (MA)
		NVU Counseling: School Counseling - Johnson (MA)
	Forens PsychBS	CU Forensic Psychology (BS)
	Mental HealthMS/ME	NVU Clin Mental Health Counseling: Adults - Johnson (MS)
		NVU Clin Mental Health Counseling: Child - Johnson (MS)
	PsychologyAA	NVU Psychology - Johnson(AA)
	PsychologyBA/BS	CU Psychological Science (BA)
		CU Psychological Science (BS)
		CU Psychology (BA)
		CU Psychology: Agency (BA)
		CU Psychology: Developmental Psychology (BA)
		CU Psychology: Forensic Psychology (BA)
		CU Psychology: Health Psychology (BA)
		CU Psychology: Honors (BA)
NVU Applied Psychology & Human Services - Lyndon (BS)		
NVU Psychology - Johnson (BA)		

		NVU Psychology: Pre-Prof. Counseling - Johnson (BA)
	Sports Studies.BA	NVU Psychology: Health & Sport Psychology - Johnson (BA)

The complete roll-up of programs and assignment to area of focus is available at the VSCS Transformation web page: <https://www.vsc.edu/vscs-academic-portfolio-review/>.

Once programs are rolled-up and assigned to an area of focus, concentrations within the total academic portfolio become more evident, as shown in Figure 1, below. For example, three areas of focus, representing Business and Accounting, Health Professions, and Athletic Training and Exercise Science represent almost 40% of total enrollments.

Figure 1: Enrollment Percentage by Area of Focus, 2016-2020



Populating the Program Evaluation Framework

Every program was assessed across a series of metrics for the years 2016-2020², reflecting size/growth, labor market demand, and student success. The specific metrics used in the evaluation included:

1. Size and Growth (Headcount): Based on the results of this analysis, each program was labeled as A, B1, B2, or C.
 - A: Above median³ size and above median growth
 - B1: Above median size and below median growth
 - B2: Below median size and above median growth
 - C: Below median size and below median growth

2. Labor Market: Based on the results of this analysis, each program was labeled as A, B, C, or Liberal Arts IndexSM.
 - A:
 - Above average new job growth & job openings
 - B:
 - Above average new job growth and below average job openings, OR
 - Below average new job growth and above average job openings
 - C:
 - Below average new job growth and below average job openings
 - Liberal Arts IndexSM:
 - This is a label for programs that fall within the categorization of liberal arts according to rpk's methodology. The purpose of this label is to ensure the market scan does not undervalue liberal arts degrees. Given the nature of these degrees, they do not always produce labor market matches that are reflective of the employment possibilities for graduates.

3. Matriculation Rate: Percentage of admitted students who enroll

4. One-Year Retention Rate at the Institution

5. Student Success:
 - 6-Year Graduation for Bachelor's Degrees
 - 4-Year Graduation Rate plus 4-Year Transfer Rate for Associate Degrees
 - Degree completion: the number of degrees awarded over a five-year time period

Every program was evaluated individually across the metrics listed above and assigned to one of the following categories: invest, optimize, or eliminate. **No one data point carried more or less weight than another when making recommendations.** The three program evaluation categories were defined as follows:

- Invest

² More details for each of these metrics and analyses are provided in subsequent sections of the report

³ Associate: Median Size 7.3, Median Growth -1; Bachelor's: Median Size 32.1, Median Growth -1; Master's: Median Size 10.2, Median Growth 0

- Programs that were:
 - Above median size
 - Above median growth
 - Above 40% for matriculation rate, above 80% on retention, or above 55% for graduation
- Optimize:
 - Programs that were
 - Above median size
 - Above or below median growth
 - 'A' or 'B' indications of labor market demand
 - Above 40% for matriculation rate, above 80% on retention, or above 55% for graduation
 - Programs that were small or shrinking but were nested within other degree programs (such as an Associate that fell short of criteria for optimization, but were attached to a Bachelor's that met criteria for optimization)
- Eliminate:
 - Programs that were:
 - Below median size and above or below median growth, or below median size and growing
 - 'C' for labor market demand
 - Programs that were:
 - Above median size and shrinking
 - Below 40% for matriculation rate, below 80% on retention, or below 55% for graduation

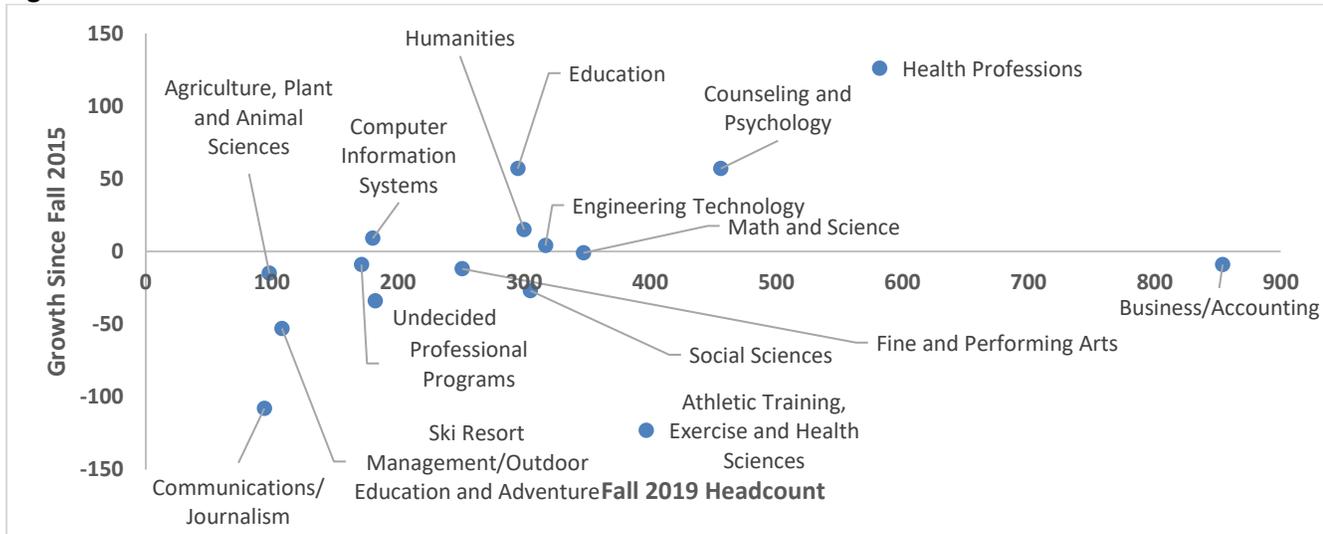
Results of the Analysis

Utilizing the Framework and the established metrics, rpk first evaluated the areas of focus and programs based upon size and growth, and the labor market. An additional lens was applied looking at teaching efficiencies.

Size and Growth Analysis

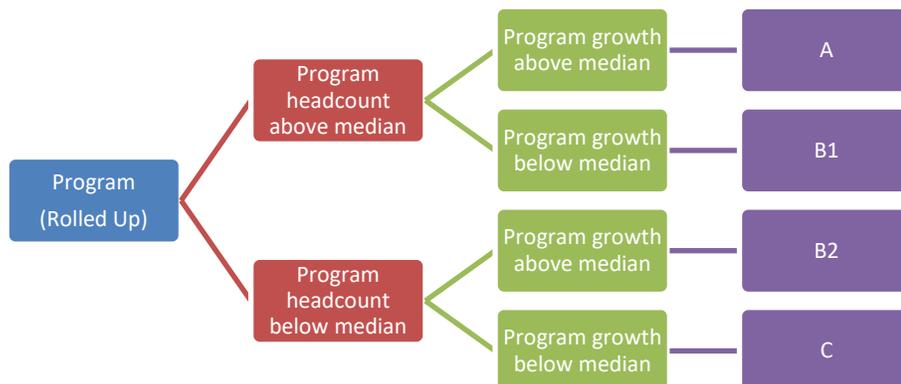
Looking at size and growth trends by area of focus across the years of analysis in Figure 2, the combined academic portfolio has clear areas of concentration and growth, such as in the area of Health Professions. Business and Accounting as well as Athletic Training, Exercise and Health Sciences are also larger areas of concentration, though enrollment has declined in both areas over time.

Figure 2: Fall 2019 Headcount and Headcount Growth Since Fall 2015



In addition to looking at size and growth by area of focus, rpk also looked at these metrics by program. Figure 3 outlines the Framework used to assign each program to a specific category based on the program size and growth trajectory.

Figure 3: Size and Growth Analysis Framework



Program size and growth was determined by unduplicated fall headcount enrollment. Headcount is defined by the number of students who have declared a major in the program. Growth refers to headcount change from 2016 – 2020. The following programs, however, did not have data in 2016, so the growth was adjusted to begin measuring from the first year of data:

- ForestryAAS
- Graph DesignAA

- Studio ArtAA
- Social EntrepAAS
- Climate SciBS
- Intl Relations/AffairsBA
- Radiol SciBS
- Social EntrepBA/BS
- Software EnginMS
- Mental HealthMS/ME

The medians for each program type are as follows:

- Associate – Median size: 7.3; Median growth: -1
- Bachelor’s – Median size: 32.1; Median growth: -1
- Master’s – Median size: 10.2; Median growth: 0

Table 2: ‘A’ Programs – Above median size and growth

A		
Associate Programs	Bachelor's Programs	Master's Programs
Arch Bldg Eng TechAAS Constr MgtAAS DieselAAS Info TechAS LandscapeAAS NursingAS Software EnginAS	BiologyBA/BS Business Admin/Mgmt BA/BS Comp Info SystBS Dental HygBS Early ChildhoodBA/BS Elec Eng TechBS HistoryBA MultidisBA NursingBS PilotBS Software EnginBS Sport MgmtBA/BS	CounselingMA Edu LicensureMA Sport MgmtMS

Table 3: ‘B1’ Programs – Above median size and below median growth

B1		
Associate Programs	Bachelor's Programs	Master's Programs
AutoAAS Business Admin/Mgmt AS/AAS Civil Env Eng TechAE Dairy Mgt TechAAS Elec Eng TechAE Gen StudAA/AAS Mech Eng TechAE Respir TherAS Vet TechAAS	AcctBA/BS AnimationBFA ArtBA/BFA Athletic TrainBS Atmos SciBS Constr MgtBS Crim JusticeBA/BS Digit CommBA/BF/BS Elec Mech Eng TechBS Elementary and Special EducationBA/BS Environ SciBS Health Phys EdBS Health SciBA/BS Holistic HealthBS Info TechBS	Applied BehavMA Edu ProfessionalMA/ME Mental HealthMS/ME Special EdMA/ME

	MathBA/BS Media CommBA/BS Music BusinessBA/BS Outdoor EdBA/BS Polit SciBA PsychologyBA/BS Social WorkBSW Undecl/ECBA/BS	
--	--	--

Table 4: 'B2' Programs – Below median size and above median growth

B2		
Associate Programs	Bachelor's Programs	Master's Programs
Agribus AAS	Arch Bldg Eng TechBS	AcctMS
Comp Eng TechAE	Area StudiesBA	Arts AdminMA
Comp Info SystAS	ChemistryBS	Music EdMUE
Crim JusticeAS	Climate SciBS	Software EnginMS
Digit CommAA/AS	Comp Eng TechBS	Studio ArtMF
ForestryAAS	Creat WritBF	
Gen Engin TechAAS	Ecol StudBA	
Graph DesignAA	EnglishBA	
PhotographyAA/AS	Graph DesignBA	
Social EntrepAAS	Hosp TourismBA/BS	
Special EdAS	InterdisBA/BS	
Studio ArtAA	Intl Relations/AffairsBA	
	Math and StatsBA/BS	
	Mfg Eng techBS	
	Music EdBM/BME	
	MusicBA	
	Radiol SciBS	
	Social EntrepBA/BS	
	Social Sci BA	
	Social StudiesBA	
	Sports Studies.BA	
	Studio ArtBF	
	Sustain/RenewBS	

Table 5: 'C' Programs – Below median size and below median growth

C		
Associate Programs	Bachelor's Programs	Master's Programs
ArtAA/AS Music Ind/ProdAS Tech TheaterAA	Agribus BS AnthropologyBA JournBA LiteratureBA Media ArtsBA Natur Sci PreBS SociolBA Sustain StudBS Theater ArtsBA	InterdisMA

Labor Market Analysis

A critical part of analyzing the academic offerings within the portfolio was evaluating the program against Vermont labor market needs. A gap analysis and a program analysis were both executed. The results of the analysis are detailed below, and further information can be found in the methodology section of this report beginning on page 53.

The gap analysis examined statewide occupational employment projections and identified whether VSCS currently offers programs to prepare students for those jobs. VSCS can use this information to identify opportunities for new VSCS programs (unmet demand). The results of the gap analysis are included in Table 6. There are clear areas in the gap analysis where VSCS could expand existing degree programs to capture additional markets, such as in business and nursing. There are other areas where the state may not choose to invest due to the ability of other institutions in Vermont or the region being able to meet demand, such as in law.

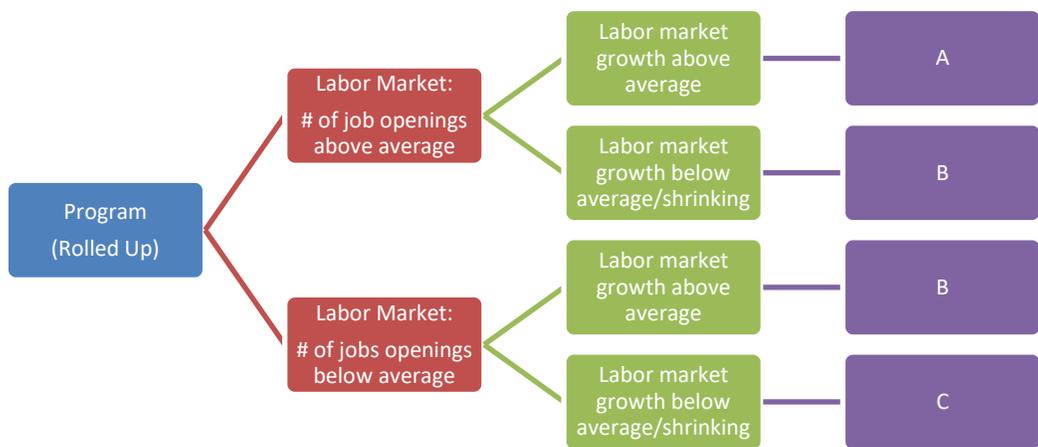
Table 6: Labor Market Gap Analysis

SOC Code	Occupation	Typical Education Level for Occupation Entry	% New Job Growth 2018-2020	Annual Job Openings 2018 - 2028	Accessible to Liberal Arts Graduates?
13-1199	Business Operations Specialists, All Other	Bachelor's degree	5.80%	123	yes
13-1041	Compliance Officers	Bachelor's degree	6.30%	208	yes
15-1151	Computer User Support Specialists	Some College, no degree	12.00%	138	
13-1071	Human Resources Specialists	Bachelor's degree	2.80%	129	yes
23-1011	Lawyers	Professional Degree	2.70%	83	
13-1161	Market Research Analysts and Marketing Specialists	Bachelor's Degree	19.30%	219	yes
31-9011	Massage Therapists	Subbaccalaureate certificate	3.80%	109	
11-9111	Medical and Health Services Managers	Bachelor's degree	11.40%	116	yes
31-9092	Medical Assistants	Subbaccalaureate certificate	10.30%	111	
21-1023	Mental Health and Substance Abuse Social Workers	Master's degree	12.10%	136	

SOC Code	Occupation	Typical Education Level for Occupation Entry	% New Job Growth 2018-2020	Annual Job Openings 2018 - 2028	Accessible to Liberal Arts Graduates?
31-1014	Nursing Assistants	Subbaccalaureate certificate	7.80%	404	
23-2011	Paralegals and Legal Assistants	Associate degree	10.50%	89	yes
21-1018	Substance Abuse, Behavioral Disorder, and Mental Health Counselors	Bachelor's degree	17.70%	116	yes
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	Bachelor's degree	3.90%	135	yes

In addition to the gap analysis, rpK also looked at labor market demand by program. Figure 4 outlines the framework used to assign each program to a specific category based on number of job openings and average labor market growth.

Figure 4: Program Labor Market Analysis Framework



Tables 7-10 below provide details on how the rolled-up programs fell within the program labor market analysis framework. For example, AgribusAAS in Table 7 is an Associate program that had a higher than average number of projected job openings and the growth of the labor market associated with that degree is also above average, resulting in an 'A' label. Table 10 references the Liberal Arts IndexSM, which is described in more detail on page 54.

Table 7: 'A' Programs: Above average new job growth and job openings

A		
Associate Programs	Bachelor's Programs	Master's Programs
Agribus AAS	AcctBA/BS	AcctMS
Business Admin/Mgmt AS/AAS	Agribus BS	Arts AdminMA
Comp Info SystAS	Business Admin/Mgmt BA/BS	Business Admin/Mgmt MBA
Constr MgtAAS	Comp Info SystBS	CounselingMA
Digit CommAA/AS	Constr MgtBS	Leadership MA
Gen StudAA/AAS	Digit CommBA/BF/BS	NursingMSN
Info TechAS	Forens PsychBS	Software EnginMS
LandscapeAAS	Health Phys EdBS	Sport MgmtMS
NursingAS	Hosp TourismBA/BS	
Social EntrepAAS	Info TechBS	
Software EnginAS	Media ArtsBA	
	NursingBS	
	Outdoor EdBA/BS	
	Social EntrepBA/BS	
	Software EnginBS	
	Sport MgmtBA/BS	
	Sports Studies.BA	

Table 8: 'B' Programs: Above average new job growth and below average job openings OR Below average new job growth and above average job openings

B		
Associate Programs	Bachelor's Programs	Master's Programs
Arch Bldg Eng TechAAS	Arch Bldg Eng TechBS	Applied BehavMA
AutoAAS	Athletic TrainBS	Athletic TrainMAT
Civil Env Eng TechAE	BiologyBA/BS	Edu LicensureMA
Gen Engin TechAAS	ChemistryBS	Music EdMUE
MathAS	Data SciBS	Special EdMA/ME
Radiol SciAS	Ecol StudBA	
	Elementary and Special	
Special EdAS	EducationBA/BS	
Vet TechAAS	Environ SciBS	
	Holistic HealthBS	
	Math and StatsBA/BS	
	MathBA/BS	
	Mfg Eng techBS	
	Music EdBM/BME	
	Radiol SciBS	
	Sustain/RenewBS	

Table 9: 'C' Programs: Below average, but positive, new job growth and below average job openings OR declining employment and below average job openings

C		
Associate Programs	Bachelor's Programs	Master's Programs
Comp Eng TechAE	Career TechBAS	Edu ProfessionalMA/ME
Crim JusticeAS	Comp Eng TechBS	InterdisMA
Dairy Mgt TechAAS	Crim JusticeBA/BS	Studio ArtMF
DieselAAS	Dental HygBS	
Elec Eng TechAE	Early ChildhoodBA/BS	
ForestryAAS	Elec Eng TechBS	
Mech Eng TechAE	Wildlife ConservBS	

Table 10: Liberal Arts IndexSM Programs

Liberal Arts		
Associate Programs	Bachelor's Programs	Master's Programs
ArtAA/AS	AnimationBFA	
Graph DesignAA	AnthropologyBA	
Media CommAA/AS	Archeol Geog AnthBS	
Music Ind/ProdAS	Area StudiesBA	
PhotographyAA/AS	ArtBA/BFA	
PsychologyAA	Creat WritBF	
Studio ArtAA	EnglishBA	
Tech TheaterAA	Graph DesignBA	
	HistoryBA	
	InterdisBA/BS	
	Intl Relations/AffairsBA	
	JournBA	
	LiteratureBA	
	Media CommBA/BS	
	MultidisBA	
	Music BusinessBA/BS	
	MusicBA	
	Perform ArtsBA	
	Polit SciBA	
	PsychologyBA/BS	
	Social Sci BA	
	Social StudiesBA	
	Social WorkBSW	
	SociolBA	
	Studio ArtBF	
	Sustain StudBS	
	Theater ArtsBA	
	Undecl/ECBA/BS	

Teaching Efficiencies

In addition to analyzing the programs offered in terms of size, growth, and connection to labor market, it is also important to understand how faculty and course offerings are distributed across the areas of focus. While available data

and the project timeframe did not allow for a net revenue analysis by program, an understanding of course and student credit activity and the total teaching labor pool serve as good proxies for understanding and improving financial sustainability. Based on the data below, it is clear that combining the three institutions into a single institution should naturally enhance teaching efficiencies. Duplication of effort will be reduced as programs and departments are streamlined and combined. Greater utilization of online and hybrid options to enable statewide access should further enhance those efficiencies.

Faculty Analysis

Figure 5 below shows the total full-time equivalent (FTE) faculty count, broken out by full-time, part-time, and overload faculty, as well as the total number of student credit hours taught in the years of the analysis. The total number of student credit hours and faculty FTE are declining, but student credit hours declined more than faculty FTE over this time period.

Figure 5: Full-time Equivalent Faculty and Total Student Credit Hours (three institutions combined)

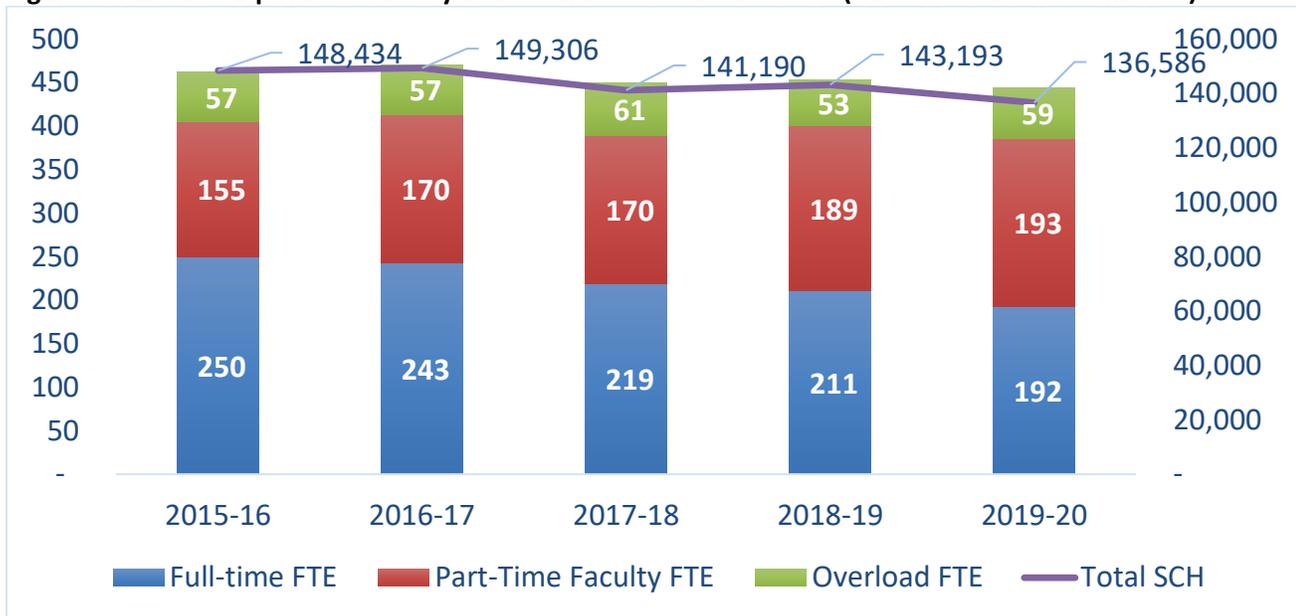
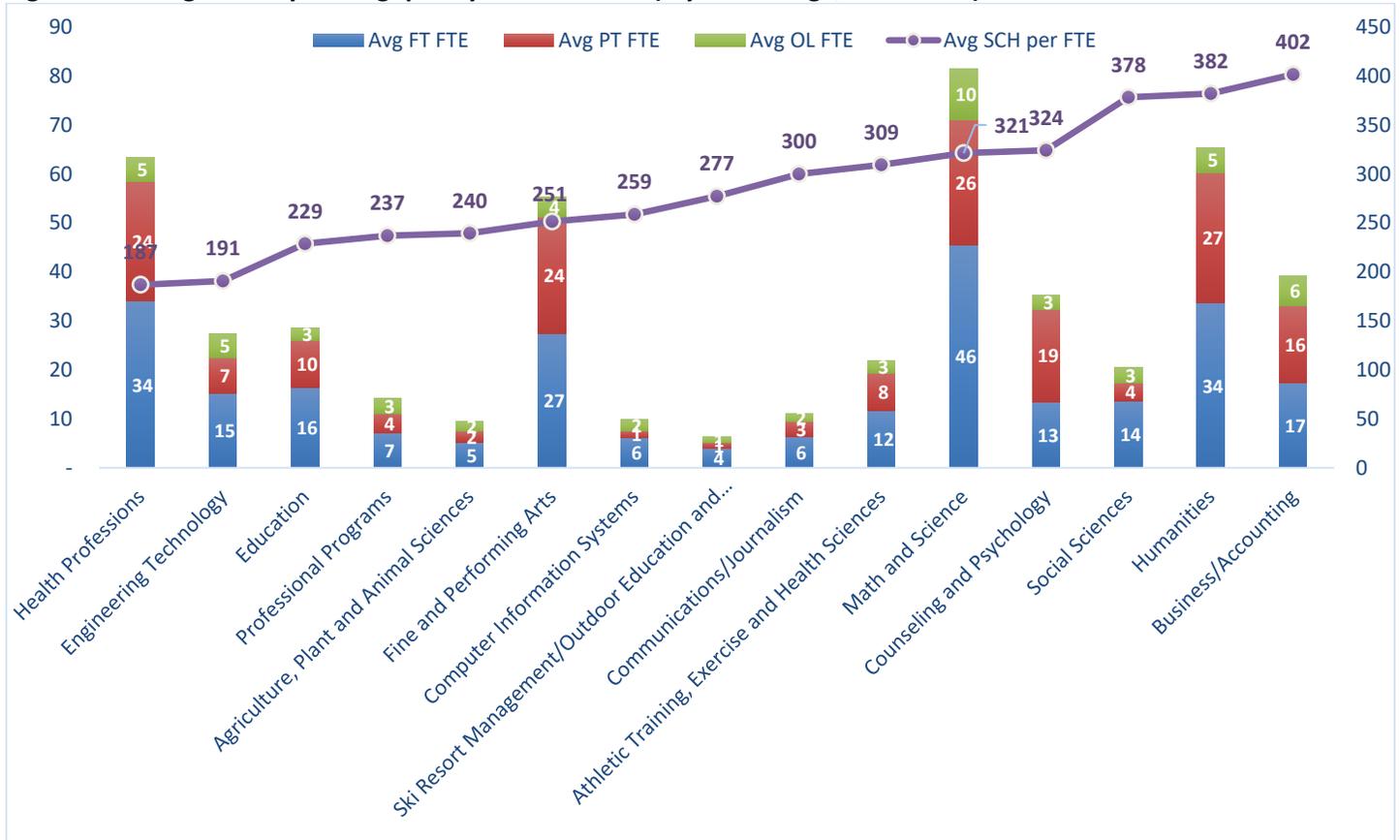


Figure 6 shows the average faculty FTE by faculty type (full-time, part-time, and overload), as well as the number of student credit hours taught per full-time equivalent faculty member, by area of focus. This analysis is often referred to as faculty throughput, and is used to understand the typical teaching workload for faculty across disciplines. The metric helps identify potential areas for efficiency improvements. When faculty throughput is low, or lower than expected, that can be an indication of an institution having very small class sizes or offering too many sections of courses that are under-enrolled. When looking at the three institutions in this analysis as a single institution, the overall faculty throughput appears to be very low. The average throughput is 300 - about 25% lower than the national average for institutions of this size. While throughput overall is low, the variation in throughput across VSCS is common in higher education. For example, the Health Professions have low throughput and Business/Accounting has high throughput.

Figure 6: Average Faculty Throughput by Area of Focus (5-year average, 2016-2020)



Course Analysis

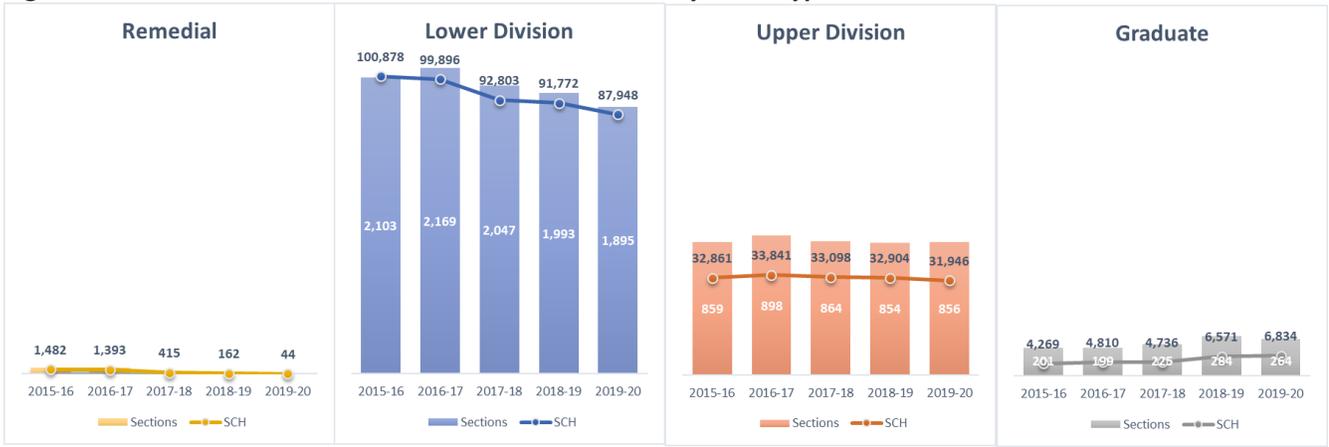
For the course analysis, rpk also examined the three institutions as one to measure average class size, number of sections, and total student credit hours.

Figure 7 shows the average class size by class type. The four class types, using VSCS’s existing structure, are remedial, lower division, upper division, and graduate. Figure 8 shows the same breakdown using the number of sections offered and the total number of student credit hours. In general, the average class sizes across courses and sections are low, indicating room for improvement. That improvement should be supported naturally, in part, as duplication of effort is eliminated. A bright spot to celebrate is the increase in graduate student credit hours over the time period.

Figure 7: Average Class Size by Class Type



Figure 8: Number of Sections and Student Credit Hours by Class Type



As class sizes increase, average student credit hours per faculty FTE increase as well. If VSCS chooses to target an initial 25% increase in faculty student credit hour production, that would bring the average student credit hours per faculty FTE up to 356. This throughput is equivalent to average class sizes of 15, based on a 4:4 load of 24 credits of teaching per year. As is evident in Table 6, student credit hours per faculty FTE production varies by area of focus, which is appropriate. Some disciplines can support larger class sizes while others cannot, so holding all areas of focus, departments, or disciplines to the same standard would risk pedagogical misalignment. Instead, focusing on a 25% minimum initial improvement across the board will allow for appropriate differentiation.

The example provided in Table 11 shows how relatively minor changes in average class size can result in significant gains in student credit hours delivered per faculty FTE – gains which maintain academic quality while moving VSCS toward its goal of financial sustainability.

Table 11: Example of Student Credit Hour Productions as a Result of Average Class Size Increases

Number of Students (Average Class Size)	Number of Students Multiplied by 24 Credits
16	384
17	408
18	432
19	456
20	480

Geographic Analysis

The final piece of the analysis examined each institution and the areas of focus using a geographic analysis. This analysis aims to understand where students are coming from to attend their academic program. Figure 9 shows in-state vs. out-of-state enrollment percentages by area of focus, and Figure 10 shows how far student’s home addresses are relative to the address of their academic program. Seventy-seven percent of undergraduate students from the three institutions over the five years of analysis were in-state students, and 54% enrolled in programs within 49 miles of their home address.

Figure 9: In-State vs. Out-of-State Enrollment, 2016-2020 Combined Headcount

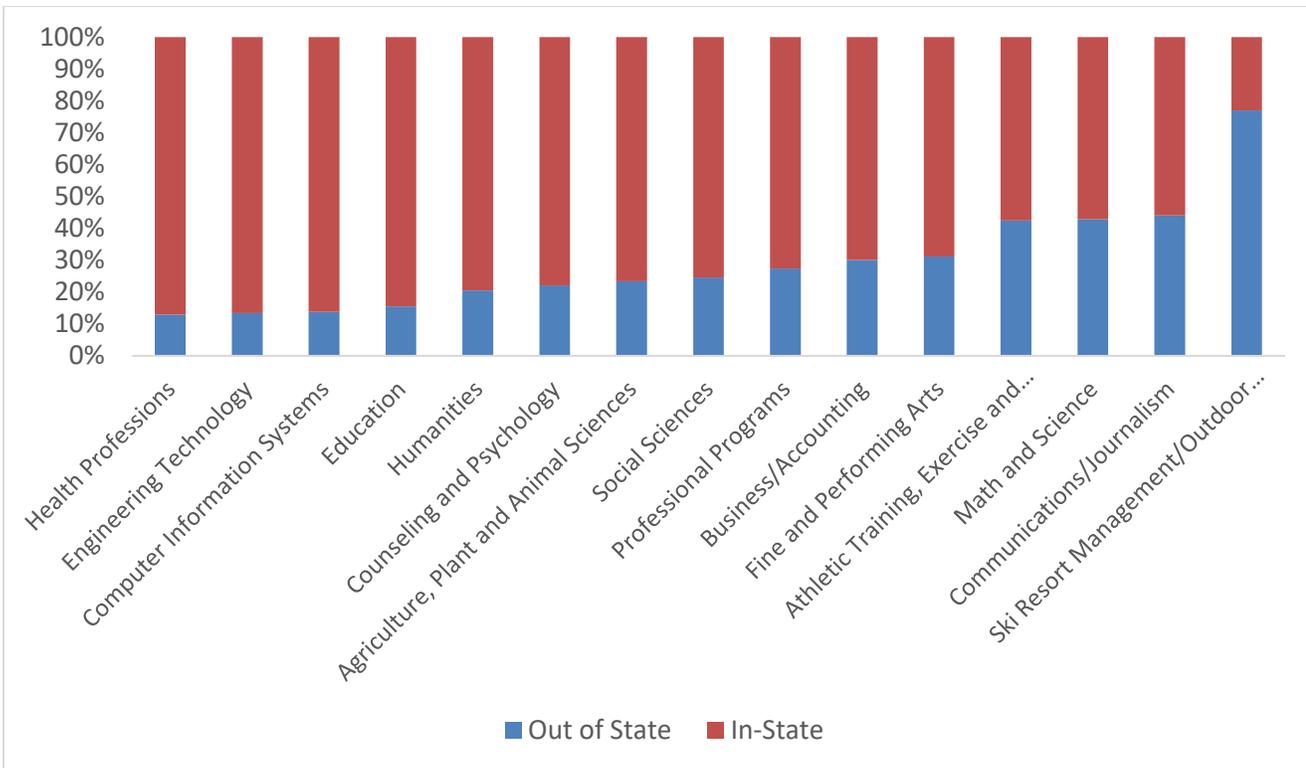
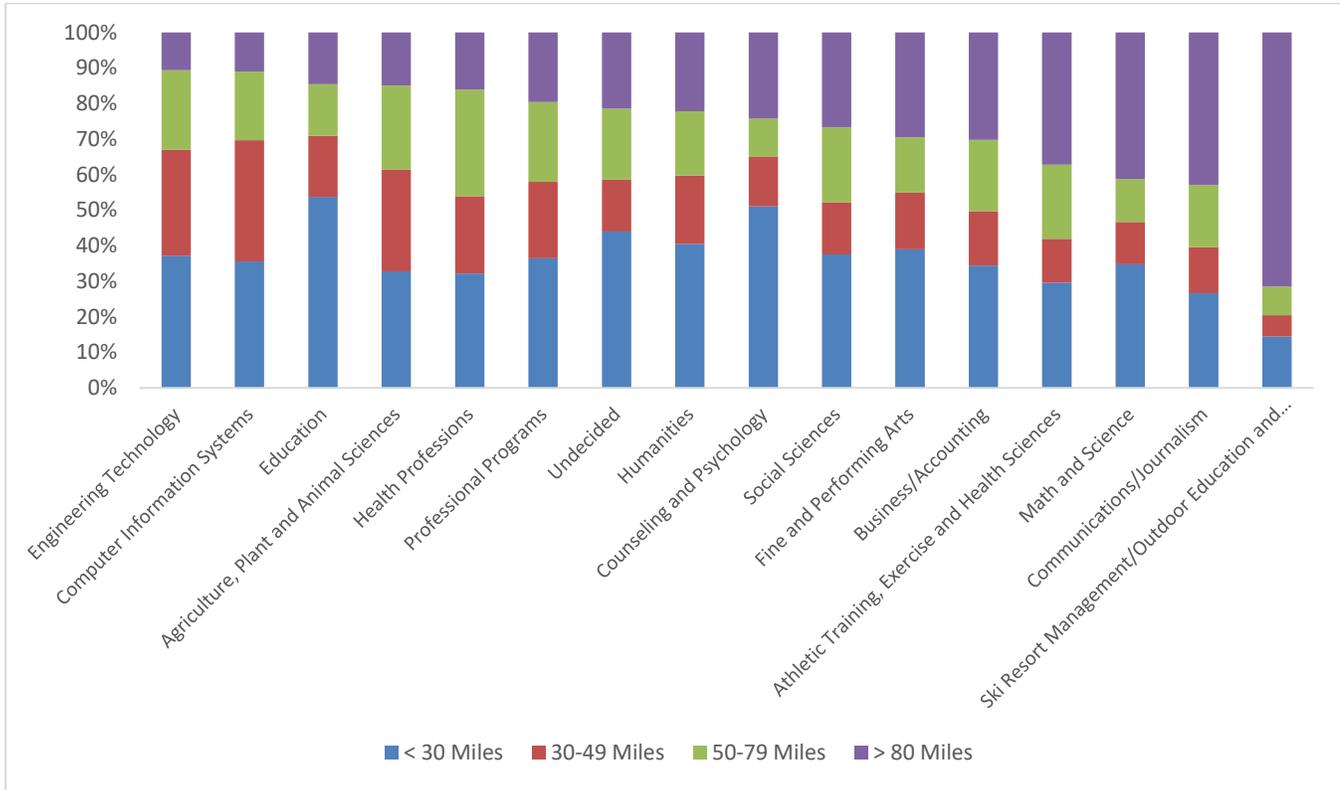


Figure 10: Miles Program is Located from Student Home Address, 2016-2020 Combined Headcount



It is evident from this analysis that the three institutions serve primarily Vermont students. However, some programs have significant out-of-state enrollment or serve students who are traveling upwards of 80 miles from their home address to attend the institution.

Starting on page 26, the Program Evaluation Framework captures the metrics for each area of focus, and provides recommendations by program for investment, optimization or elimination.

Engagement Across VSCS

During the period of analysis, rpk engaged with faculty, academic leadership and senior leadership across the System. That engagement reflected biweekly meetings with the chief academic officers from Castleton, NVU, Vermont Tech, and CCV, two meetings with the Council of Presidents, and two meetings with an academic Advisory Group created by VSCS leadership. Critical touch points in the process are identified in Table 12 below:

Table 12: Stakeholder Engagement

Date	Description	Audience Engaged
March 15, 2021	Introduction to the framing of the analysis	Advisory Group
April 7, 2021	Review of initial analyses	Advisory Group
April 21, 2021	Draft analysis and findings	Academic Leadership: Chairs, Program Directors
April 30, 2021	Draft analysis and findings	All Faculty

Beginning on April 21, 2021, a Google Form was also made available to collect feedback from any stakeholder who wished to comment or ask questions. In addition to the Google Form, stakeholders were encouraged to reach out to Katie Hagan, the rpk project lead, directly via email, or share their feedback with their institutional leadership who could then pass it on to rpk. The form remained open until May 10, 2021, and all feedback received is reflected in this report. In addition, an April 30, 2021 meeting with faculty was recorded and is available [here](#), along with the comments and questions that were submitted via chat during the meeting. rpk also received a written feedback report on behalf of faculty at Vermont Tech. The primary themes of the feedback are described below, and more details are provided as appropriate within the area of focus sections of the report.

Key themes that emerged from the feedback included the following:

1. Questions on program groupings or placements within areas of focus.

Many individuals inquired as to why particular programs were grouped together and suggested alternative groupings or assignments to areas of focus that they felt better captured or represented programs alignment. In some cases, programs were being assigned an incorrect CIP code by VSCS, which was immediately remedied in the analysis. In other cases, feedback was provided that programs were similar but were being reported as two separate programs in the analysis, such as Art and Studio Art, or Digital Communications and Media Communications. In those instances, programs were kept distinct. As part of the recommended optimization work for Summer 2021, opportunities can be captured to align curriculum and ultimately assign the same codes to the newly aligned offerings as a single degree.

2. Efforts to improve and streamline administrative services.

Faculty members suggested savings opportunities may be available through streamlining administrative services and expressed a desire for VSCS to focus attention there as soon as possible, utilizing a process as robust as the academic portfolio review.

3. Opportunities to iterate on the analysis going forward.

Individuals pointed out other data points that could be included going forward in an evaluation of the academic portfolio, such as financial health, earnings and outcomes of program graduates, and research and service contributions of faculty. While the current analysis was based upon the available data, VSCS should view this as a “living” approach and seek to enhance the Framework as additional data becomes available. In effect, the Framework can become a new, ever more robust lens with which VSCS can view itself.

4. **Optimization timeframe.**

Recognizing the critical milestones established by the legislature and the importance of making decisions to support the needs of Vermont’s students and employers, faculty noted the need to begin the optimization (Summer 2021) phase of this project as soon as possible.

5. **Future consideration of labor market needs beyond VT.**

The portfolio analysis, by design, analyzed labor market demand exclusively in the State of Vermont. Faculty noted that VSCS institutions do serve out-of-state students, especially in select programs, and that graduates will go on to work outside of the state. The goal and scope of this project, however, was to understand how well the state college System met the needs of employers in the state, which is why the focus remained exclusively on Vermont.

More specific feedback by area of focus is provided in the subsequent sections.

Recommendations: Summary

rpK recommends that VSCS adopt the Program Evaluation Framework for annual evaluations, begin work to optimize the academic portfolio, and consider programs for elimination and investment as noted in the program-by-program recommendations.

Recommendation 1: Adopt the Program Evaluation Framework

VSCS should adopt the Program Evaluation Framework for portfolio evaluation and use this Framework to report on the portfolio's health to the Board of Trustees annually. This recommendation could include an update to Policy 109 (Annual Enrollment and Cost Effectiveness Review of Existing Academic Programs).

The Program Evaluation Framework provides a more nuanced approach to assessing academic programs and is a solid foundation upon which VSCS can build going forward. VSCS should develop a dashboard of Framework metrics that is updated regularly, supporting enhanced transparency across all stakeholder groups.

Recommendation 2: Optimize the Academic Portfolio

VSCS leadership should move forward to carry out the work of optimizing the academic portfolio beginning in the Summer of 2021. This will allow VSCS to recruit a new class of students into the unified academic portfolio for Fall 2022.

Convening the work groups during Summer 2021 to consider programs identified for optimization will provide continued input from VSCS faculty, and allow VSCS to benefit from their curricular expertise. That work should be framed by a careful set of charges to the work groups. rpK's analysis suggests that the optimization work is likely to result in additional opportunities for program consolidation, as noted in the detailed recommendations below.

Recommendation 3: Invest in and Eliminate Identified Programs

VSCS leadership should review and make final decisions on the recommendations for program investment and elimination. That decision making could be further informed by the optimization work noted in Recommendation 2.

Recommendations: Detailed

The following pages contain narrative reports for each area of focus, as well as recommendations to invest, optimize, or eliminate programs within each area of focus. There are two tables for each area of focus – the program level variables and the area of focus level variables.

Agriculture, Plant and Animal Sciences

The Agriculture, Plant and Animal Sciences area of focus includes programs that are clear strengths within the VSCS portfolio, as well as opportunities for overall improvement. Total faculty FTE over five years is unchanged but student credit hours have declined resulting in lower student credit hour production per full-time equivalent faculty. Therefore, in addition to critically evaluating the future state of remaining programs, effort should be made to improve teaching efficiency within this area of focus.

Optimize

- The AgribusAAS and BS are small, but the Vermont labor market indicates demand for graduates. Effort should be made to optimize those programs, including improving the matriculation and completion rates.
- Dairy Mgt TechAAS is large but has poor labor market demand. For the students that do enroll, most are retained and complete or transfer within four years. This high level of student success makes this a successful program, but the lack of labor market demand indicates that it should not be a candidate for investment.
- LandscapeAAS is larger (for an Associate degree), growing, and has strong student success indicators.
- VetTechAAS is a large and growing program with strong student success metrics.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Agribus AAS	B2	A	5.8	32%	64%	50%		12	Optimize
Agribus BS	C	A	14.6	28%	63%		26%	18	Optimize
Dairy Mgt TechAAS	B1	C	18.6	53%	77%	78%		47	Optimize
LandscapeAAS	A	A	11.0	48%	68%	62%		14	Optimize
Vet TechAAS	B1	B	63.4	47%	83%	87%		16	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Agriculture, Plant and Animal Sciences	Average	Change over Time
Full-Time Faculty FTE	5.3	-1.0
Overload Faculty FTE	2.0	-0.4
Part-Time Faculty FTE	2.2	1.4
Total Faculty FTE	9.5	0.0
Average Student Credit Hours	2,274	-146
Student Credit Hours per Faculty FTE	239.6	-15.1

Feedback:

During the course of this analysis, Vermont Tech completed an analysis of all agriculture programs in an attempt to identify a path forward for these programs that is sustainable and aligned to labor market needs. Vermont Tech suggested that program enrollment in LandscapeAAS has declined since Fall of 2019 (the most recent term for this analysis) and therefore the recommendation to optimize should be re-visited with more recent data.

Athletic Training, Exercise and Health Sciences

The Athletic Training, Exercise and Health Sciences area of focus is a strong area for VSCS. Approximately 9% of students enroll in programs in this area of focus, and every program is recommended for optimization. The programs are spread out across Castleton and NVU, so the work of optimization in this area will require alignment of curriculum and streamlining of degree offerings. On average, a full-time equivalent faculty member in this area produces 309 student credit hours annually, which is low for the disciplines represented in this area of focus and has declined over time as faculty full-time equivalents increased and student credit hours decreased. Optimization efforts should support increased faculty student credit hour production.

Invest

- No recommendation to invest.

Optimize

- As stated above, all programs in this area of focus are candidates for optimization.

Eliminate

- No recommendation to eliminate.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Athletic TrainBS	B1	B	42.0	15%	72%		58%	46	Optimize
Athletic TrainMAT	(blank)	B	New Program	0%					New Program
Exerc Sport SciBS	(blank)	(blank)	New Program	80%	75%				New Program
Health Phys EdBS	B1	A	189.0	23%	68%		49%	174	Optimize
Health SciBA/BS	B1	(blank)	181.8	23%	65%		57%	167	Optimize
Holistic HealthBS	B1	B	40.6	41%	73%		40%	88	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Athletic Training, Exercise and Health Sciences	Average	Change over Time
Full-Time Faculty FTE	11.7	1.1
Overload Faculty FTE	2.6	-0.6
Part-Time Faculty FTE	7.7	-0.2
Total Faculty FTE	22.0	0.3
Average Student Credit Hours	6,788	-776
Student Credit Hours per Faculty FTE	309.3	-39.4

Feedback:

rpk received a suggestion from one faculty member to combine Exerc Sport SciBS and Health Sci/Phys TherBA/BS. rpk did not make this change due to the differing CIP codes, but suggests the optimization work consider this possibility when aligning program offerings and curriculum. rpk also received feedback from one faculty member that the labor market analysis could look at out of state demand. As noted above, the goal and scope of this analysis was, by design, to look only at labor market demand within Vermont. Future iterations on the analysis could consider demand outside of Vermont.

rpk was informed that the Athletic TrainBS at Castleton is being phased out and replaced with the Athletic TrainMAT, responding to the requirement for students to obtain an MA degree to sit for the national licensure exam. Faculty at Castleton asked that Athletic Training be considered for movement to the Health Professions area of focus as they consider athletic trainers to be “licensed health professionals”, and the national accreditor promotes program linkages with other health profession degrees. rpk did not make this change, but the faculty work groups can explore this shift during the Summer 2021 optimization work.

Business/Accounting

Business/Accounting is a strong area of focus for the Vermont State Colleges System. Efforts need to be made across institutions to align offerings and curriculum, and some degrees should be eliminated so that attention can be focused on the healthiest remaining degree programs. The Vermont labor market clearly indicates demand for graduates in these fields, and historically business programs provide a high return on investment to institutions and systems. VSCS should consider several programs in this area of focus for investment. However, while this area of focus produces the highest student credit hours per faculty full-time equivalent, the average is low relative to national standards for the discipline. Faculty teaching productivity is declining in this area as reductions in full-time equivalent faculty have not kept pace with the reduction in student credit hour delivery. The effort to align similar but currently competing programs within this area of focus should ultimately reduce the need for part-time faculty and faculty overloads.

Invest

- Business Admin/Mgmt(BA/BS) is a large, growing program with clear labor market demand.
- Sport Mgmt(BA/BS, MS) is an area of clear demand in the labor market. The BA/BS has strong retention. Investment efforts should focus on increasing matriculation and completion.

Optimize

- AcctBA/BS is an area of clear demand in the labor market. Optimization efforts should focus on increasing matriculation and completion.
- AcctMS is an area of clear demand in the labor market. The robust AcctBA/BS provides a strong pipeline to the MS.
- Hosp TourismBA/BS and Music BusinessBA/BS are two specialty programs within this area. Both have room for improvement in terms of program size and/or student success.

Eliminate

- Social Entrep(AAS, BA/BS) are too small to support continuation. Courses can be absorbed by other programs within the area of focus.
- Music Ind/ProdAS is a small program with poor labor market demand, low retention, and low completion or transfer rates.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
AcctBA/BS	B1	A	229.8	22%	71%		52%	206	Optimize
AcctMS	B2	A	6.0	66%	20%		94%	23	Optimize
Business Admin/Mgmt AS/AAS	B1	A	36.4	21%	53%	72%		83	Optimize
Business Admin/Mgmt BA/BS	A	A	288.6	23%	65%		44%	486	Invest
Business Admin/Mgmt MBA	(blank)	A	New Program	82%	26%			6	New program
Hosp TourismBA/BS	B2	A	20.2	38%	80%		53%	34	Optimize

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Music BusinessBA/BS	B1	Liberal Arts Index	94.8	26%	66%		38%	69	Optimize
Music Ind/ProdAS	C	Liberal Arts Index	3.6	11%	40%	14%		10	Eliminate
Social EntrepAAS	B2	A	3.0	62%	33%			3	Eliminate
Social EntrepBA/BS	B2	A	7.0	36%	22%			6	Eliminate
Sport MgmtBA/BS	A	A	111.8	22%	66%		51%	130	Invest
Sport MgmtMS	A	A	33.0	68%	46%			75	Invest

Area of Focus Data from Academic Departments (2016-2020)

Business/Accounting	Average	Change over Time
Full-Time Faculty FTE	17.3	-4.7
Overload Faculty FTE	6.2	-2.5
Part-Time Faculty FTE	15.8	5.7
Total Faculty FTE	39.3	-1.5
Average Student Credit Hours	15,780	-1,567
Student Credit Hours per Faculty FTE	401.7	-24.9

Feedback:

Castleton closed the Accounting MS degree due to low enrollment and created an accounting certificate and an accounting concentration within the MBA degree. Feedback indicated that any consideration of reopening the AcctMS should be preceded by a careful market analysis of student interest and perhaps partnership with large accounting firms.

Communications/Journalism

The Communications/Journalism area of focus presents a clear opportunity for curriculum and degree offering alignment between what are currently competing and similar programs at Castleton and NVU. As faculty work to align these programs, attention should be paid to increasing the number of student credit hours delivered by full-time equivalent faculty. The number of faculty in this area has declined, but not at the same level as student credit hours, resulting in faculty teaching fewer credit hours over the period studied.

Invest

- No programs in this area are identified for investment.

Optimize

- Streamline DigitComm(AA/AS, BA/BF/BS) and MediaComm(AA/AS, BA/BS) into a single offering (one at the Associate level, one at the Bachelor's).

Eliminate

- JournBA is too small and the student success metrics are too low to support continuation.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Digit CommAA/AS	B2	A	1.6	9%	33%	86%		16	Optimize
Digit CommBA/BF/BS	B1	A	80.4	21%	62%		52%	80	Optimize
JournBA	C	Liberal Arts Index	6.2	9%	67%		28%	2	Eliminate
Media CommAA/AS	(blank)	Liberal Arts Index	1.0	31%	67%	100%		0	Optimize
Media CommBA/BS	B1	Liberal Arts Index	60.2	19%	62%		61%	72	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Communications/Journalism	Average	Change over Time
Full-Time Faculty FTE	6.3	-1.9
Overload Faculty FTE	1.6	-1.0
Part-Time Faculty FTE	3.1	-1.5
Total Faculty FTE	11.1	-4.4
Average Student Credit Hours	3,317	-1,944
Student Credit Hours per Faculty FTE	299.8	-61.6

Feedback:

rpk heard from one faculty member who shared that Digit Comm and Media Comm are very similar programs. One is taught at NVU and the other is taught at Castleton. rpk chose not to combine these two programs because they currently operate under two different CIP codes, but this feedback further supports the opportunity for streamlining those degree offerings into one program of study and expanding access statewide.

Computer Information Systems

The Computer Information Systems area of focus is strong for VSCS, particularly at the Bachelor's level. Effort should be made to invest in and optimize those programs. This focus area is one of the few across the institutions that has increased faculty productivity over the time period. Student credit hours declined, but full-time equivalent faculty declined more, resulting in more teaching activity for the remaining faculty.

Invest

- Comp Info SystBS and Software Engin(AS, BS) all are above median size and growth and have strong labor market demand. Investments should be made in continuing to grow these programs while also improving matriculation and student success.

Optimize

- InfoTech(AS, BS) has strong labor market demand and high retention and completion/transfer rates.

Eliminate

- Software Engin(MS) is a very small program that has produced few degrees over the five year period studied.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Comp Info SystAS	B2	A	0.8	13%	100%	0%		4	Optimize
Comp Info SystBS	A	A	55.8	22%	76%		41%	40	Invest
Data SciBS	(blank)	B							New Program
Info TechAS	A	A	7.6	64%	67%	74%		9	Optimize
Info TechBS	B1	A	37.0	38%	75%		60%	36	Optimize
Software EnginAS	A	A	10.0	38%	62%	73%		18	Invest
Software EnginBS	A	A	58.0	42%	71%		56%	48	Invest
Software EnginMS	B2	A	6.8	69%	56%			3	Eliminate

Area of Focus Data from Academic Departments (2016-2020)

Computer Information Systems	Average	Change over Time
Full-Time Faculty FTE	6.1	-0.7
Overload Faculty FTE	2.2	-0.6
Part-Time Faculty FTE	1.4	-0.7
Total Faculty FTE	9.8	-2.0
Average Student Credit Hours	2,535	-246
Student Credit Hours per Faculty FTE	258.6	25.8

Feedback:

rpk did not receive any feedback related to this area of focus.

Counseling and Psychology

VSCS has a few strong programs within the Counseling and Psychology area of focus, particularly at the graduate level. VSCS should continue to invest in those programs while optimizing the PsychologyBA/BS. Castleton and NVU both offer a Bachelor's degree in Psychology and those should be streamlined into a single curriculum. While overall student credit hours per faculty full-time equivalent have decreased over this time period, it may be due to the growth in the graduate programs. The streamlining of programs across Castleton and NVU should create efficiencies.

Invest

- CounselingMA is a large graduate program with a high graduation rate and high matriculation rates.

Optimize

- PsychologyBA/BS should be optimized as a single offering (currently offered at both Castleton and NVU).

Eliminate

- Sports StudiesBA has a low matriculation rate and is too small to support continuation.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
CounselingMA	A	A	96.6	69%	63%		85%	126	Invest
Forens PsychBS	(blank)	A	New Program	19%	58%			6	New program
Mental HealthMS/ME	B1	(blank)	119.0	71%	52%			16	Optimize
PsychologyAA	(blank)	Liberal Arts Index						1	Optimize
PsychologyBA/BS	B1	Liberal Arts Index	275.2	20%	66%		50%	405	Optimize
Sports Studies.BA	B2	A	3.2	5%	75%			2	Eliminate

Area of Focus Data from Academic Departments (2016-2020)

Counseling and Psychology	Average	Change over Time
Full-Time Faculty FTE	13.5	-7.4
Overload Faculty FTE	3.0	-1.1
Part-Time Faculty FTE	18.9	15.0
Total Faculty FTE	35.3	6.5
Average Student Credit Hours	11,456	363
Student Credit Hours per Faculty FTE	324.2	-52.9

Feedback:

rpk was asked to note that the school psychology program at Castleton University is an MA+CAGS degree as opposed to MA only, requiring students to complete 72 hours of graduate education.

Education

VSCS offers a number of education-related degrees, and many specializations within these programs, across Castleton and NVU. This is diluting the overall System investment in faculty and resulting in low student credit hours per full-time equivalent faculty. The education area of focus saw a slight increase in student credit hours over the timeframe of the analysis, resulting in an increase of student credit hours per full-time equivalent faculty. However, at 229 students credit hours per faculty FTE, opportunity clearly exists for faculty to deliver more student credit hours by coordinating across campuses and running larger classes.

Invest

- No recommendation to invest.

Optimize

- Elementary and Special EducationBA/BS and Early ChildhoodEdBA/BS should be the primary focus at the Bachelor's level, as each are large in size and have strong retention rates.
- EducationMA is a strong offering at the graduate level based on program size and student success.

Eliminate

- Career TechBAS is small in size and few number of degrees produced since 2016.
- Music EdMUE has low enrollment, low retention, and has delivered few degrees over five years.
- Special EdAS is a very small program with no degrees delivered. If it is not a feeder program for a BA/BS or an off ramp for BA/BS students, it should be eliminated.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Applied BehavMA	B1	B	16.4	73%	39%		85%	96	Optimize
Career TechBAS	(blank)	C	2.3	100%				3	Eliminate
Early ChildhoodBA/BS	A	C	41.4	33%	76%		42%	35	Optimize
Edu LicensureMA	A	B	52.6	59%	41%		81%	86	Optimize
Edu ProfessionalMA/ME	B1	C	19.2	70%	45%		69%	49	Optimize
Elementary and Special EducationBA/BS	B1	B	83.0	22%	69%		54%	73	Optimize
Music EdBM/BME	B2	B	16.8	40%	83%		67%	7	Optimize
Music EdMUE	B2	B	4.4	74%	18%			7	Eliminate
Social StudiesBA	B2	Liberal Arts Index	1.8	4%	67%		33%	3	Optimize*
Special EdAS	B2	B	1.8	10%	67%	0%			Eliminate
Special EdMA/ME	B1	B	10.2	65%	49%		83%	19	Optimize

*The optimize recommendation here is related to the feedback area below explaining licensure programs, which indicates that some students pursuing secondary education in specific fields are not captured in this education area of focus. Effort will need to be made throughout all secondary education areas to optimize offerings for statewide access.

Area of Focus Data from Academic Departments (2016-2020)

Education	Average	Change over Time
Full-Time Faculty FTE	16.4	-4.1
Overload Faculty FTE	2.6	0.6
Part-Time Faculty FTE	9.6	3.1
Total Faculty FTE	28.6	-0.4
Average Student Credit Hours	6,543	327
Student Credit Hours per Faculty FTE	228.8	14.8

Feedback:

Education is a unique area of focus in that students who are pursuing careers in education will not always be counted in an education program area. Some students earn degrees in their area of study, such as music or art, while also taking education coursework and earning the licensure needed to become teachers. Below is a table that captures that average annual activity of student pursuing licensure in programs that are outside of the education area of focus during the period studied⁴:

Area of Focus	Program Title	Average Annual Enrollment
Athletic Training, Exercise and Health Sciences	CU Health Education: Licensure Option (BS)	2
	CU Physical Education: Teaching Option (BS)	20
	CU Practice of Physical Education: Teaching Option (BS)	41
	Health Sciences w/Elem & Sec Licensure - Johnson (BS)	2
	NVU Health Sciences with Elem & Sec Licensure -Johnson (BS)	2
Athletic Training, Exercise and Health Sciences Total		53
Fine and Performing Arts	CU Art: Art Education (BA)	6
	NVU Art w/Elem & Sec Licensure - Johnson (BA)	2
	NVU Art With Elem & Sec Licensure - Johnson (BA)	9
	NVU Music Ed/Classical with K-12 Licensure - Johnson (BA)	9
	NVU Music Ed/Jazz with K-12 Licensure - Johnson (BA)	1
	NVU Studio Art w/Elem & Sec Licensure - Johnson (BFA)	1
Fine and Performing Arts Total		27
Humanities	CU Multidisciplinary Studies (BA) ⁵	100
	NVU Creative Writing w/Sec Licensure - Johnson (BFA)	3
	NVU English w/Sec Licensure - Johnson (BA)	5
	NVU History w/Sec Licensure - Johnson (BA)	7
Humanities Total		115
Math and Science	CU Mathematics: Secondary Education (BA)	11
	NVU Biology with Secondary Licensure - Johnson (BS)	1
	NVU Environ. Science with Secondary Licensure - Johnson (BS)	
	NVU Mathematics w/Sec Licensure - Johnson (BS)	5

⁴ In addition to the degrees listed in the table, Castleton students majoring in Biology, Chemistry, English, Environmental Science, and History can complete a course of study leading to secondary licensure.

⁵ This program includes the students at Castleton who are pursuing elementary education licensure.

Area of Focus	Program Title	Average Annual Enrollment
Math and Science		17
Social Sciences	NVU Political Science w/Sec Licensure - Johnson (BA)	2
Social Sciences Total		2

Engineering Technology

Engineering Technology is a unique area of focus within VSCS given higher matriculation and student success rates. However, most programs are small. This area deserves serious attention from faculty and curriculum subject-matter experts to determine optimization opportunities. In addition, the student credit hour production of faculty is low and declining over time. Any optimization efforts should be focused on increasing student credit hour delivery and/or eliminating faculty overload.

Invest

- No recommendation to invest.

Optimize

- All programs in this area are identified for optimization

Eliminate

- No recommendation to eliminate.

Program-Level Data (2016-2020)

Program	Size/Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Graduation	Degrees Produced (5 Years)	Recommendation
Arch Bldg Eng TechAAS	A	B	8.4	33%	80%	70%		19	Optimize
Arch Bldg Eng TechBS	B2	B	30.6	38%	75%		59%	37	Optimize
Civil Env Eng TechAE	B1	B	33.4	48%	82%	81%		64	Optimize
Comp Eng TechAE	B2	C	7.0	44%	63%	73%		12	Optimize
Comp Eng TechBS	B2	C	29.4	30%	81%		63%	23	Optimize
Elec Eng TechAE	B1	C	27.4	55%	86%	67%		65	Optimize
Elec Eng TechBS	A	C	36.2	40%	72%		40%	35	Optimize
Elec Mech Eng TechBS	B1	(blank)	65.0	53%	75%		56%	101	Optimize
Gen Engin TechAAS	B2	B	2.2	46%		0%		20	Optimize
Mech Eng TechAE	B1	C	37.6	40%	70%	67%		95	Optimize
Mfg Eng techBS	B2	B	22.6	35%	86%				Optimize
Sustain/RenewBS	B2	B	16.6	53%	81%			4	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Engineering Technology	Average	Change over Time
Full-Time Faculty FTE	15.2	0.2
Overload Faculty FTE	4.8	0.5
Part-Time Faculty FTE	7.4	1.7
Total Faculty FTE	27.3	2.5
Average Student Credit Hours	5,210	-128
Student Credit Hours per Faculty FTE	190.8	-21.2

Feedback:

rpk received feedback related to two programs in this area of focus (Mfg Eng TechBS and Sustain/Renew BS) that resulted in changes in CIP codes to better align to labor market categories.

Fine and Performing Arts

While Fine and Performing Arts may serve a critical mission component within VSCS, few programs on their own achieve the necessary size, labor market connection, or student success rates to justify investment or optimization. This area needs to be critically considered against VSCS mission, and mission-critical programs should receive support while other programs should be eliminated. Both full-time equivalent faculty numbers and student credit hours declined over the time period of the analysis, resulting in the area of focus having a higher student credit hours per faculty FTE metric at 252. However, the programs within this area of focus are quite different and faculty teaching efficiency should be evaluated depending on the discipline.

Invest

- No recommendation to invest.

Optimize

- ArtBA/BFA is the strongest program in this area in terms of program size and degree production. Faculty should attempt to streamline ArtBA/BFA and Studio ArtBF into a single offering.
- AnimationBFA is above median size and has high retention.
- MusicBA is a small program but growing and has high retention.
- Theater ArtsBA is both below median size and growth, but it has strong graduation rates.

Eliminate

- ArtsAdminMA is too small to support continuation.
- PhotographyAA/AS is a small program with few degrees awarded over the time period.
- Studio ArtMF is a small program with few degrees awarded over the time period.
- TechTheaterAA is below median size and growth. The small size will make it difficult for the program to achieve the level of efficiency needed to continue operating.

Program-Level Data (2016-2020)

Program	Size/Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
AnimationBFA	B1	Liberal Arts Index	37.4	29%	79%		51%	18	Optimize
ArtAA/AS	C	Liberal Arts Index	4.6	6%	75%	63%		6	Optimize
ArtBA/BFA	B1	Liberal Arts Index	78.6	25%	73%		47%	65	Optimize
Arts AdminMA	B2	A	3.0	73%	7%			12	Eliminate
Graph DesignAA	B2	Liberal Arts Index	0.5	0%					Optimize
Graph DesignBA	B2	Liberal Arts Index	27.0	28%	68%		39%	14	Optimize
Media ArtsBA	C	A	23.0	26%	68%		43%	27	Optimize

Program	Size/Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
MusicBA	B2	Liberal Arts Index	22.6	26%	78%		44%	27	Optimize
Perform ArtsBA	(blank)	Liberal Arts Index							New Program
PhotographyAA/AS	B2	Liberal Arts Index	2.2	10%	75%			6	Eliminate
Studio ArtAA	B2	Liberal Arts Index	0.5	14%	0%				Optimize
Studio ArtBF	B2	Liberal Arts Index	31.2	31%	61%		47%	38	Optimize
Studio ArtMF	B2	C	6.2	32%	55%		75%	12	Eliminate
Tech TheaterAA	C	Liberal Arts Index	5.2	32%	73%	60%		25	Eliminate
Theater ArtsBA	C	Liberal Arts Index	23.4	28%	69%		71%	25	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Fine and Performing Arts	Average	Change over Time
Full-Time Faculty FTE	27.4	-11.2
Overload Faculty FTE	4.1	-0.1
Part-Time Faculty FTE	23.9	-1.6
Total Faculty FTE	55.3	-12.8
Average Student Credit Hours	13,910	-1,724
Student Credit Hours per Faculty FTE	251.5	29.5

Feedback:

Two faculty members expressed that ArtBA/BFA and Studio ArtBF are similar programs and could be combined. rpk chose not to combine the two programs because they currently operate under two different CIP codes, but this feedback further supports the opportunity for streamlining those degree offerings into one program of study and expanding access statewide. rpk was also asked to note that the Vermont Arts Council completed a [three-year study](#) at the same time this analysis of academic programs was finishing, which may be of use as the System moves forward with portfolio optimization.

Health Professions

All programs in this area are strong. All programs in this area should work on providing statewide access while increasing the number of student credit hours produced by full-time equivalent faculty as the current metric of 187 is low even for health professions.

Invest

- Nursing (AS and BS) is a clear area of demand from both students and the labor market and should therefore be an area of investment for VSCS.

Optimize

- Dental HygBS is a large program and growing. Efforts to ensure access statewide should be pursued in order to optimize this program.
- Respir TherAS has excellent student success outcomes and student matriculation.

Eliminate

- No recommendation to eliminate.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institutional Retention Rate	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Dental HygBS	A	C	74.4	56%	76%		71%	51	Optimize
NursingAS	A	A	142.2	77%	93%	97%		689	Invest
NursingBS	A	A	276.4	35%	80%		80%	298	Invest
NursingMSN	(blank)	A	New Program						New Program
Radiol SciAS	(blank)	B	New Program	73%	75%				New Program
Radiol SciBS	B2	B	New Program	74%	86%			5	New Program
Respir TherAS	B1	(blank)	28.8	71%	72%	89%		54	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Health Professions	Average	Change over Time
Full-Time Faculty FTE	34.0	-2.8
Overload Faculty FTE	5.0	8.0
Part-Time Faculty FTE	24.4	9.3
Total Faculty FTE	63.4	14.5
Average Student Credit Hours	11,843	1,363
Student Credit Hours per Faculty FTE	186.8	-22.4

Feedback:

The nursing programs at Castleton and Vermont Tech have already begun efforts to create alignment across campuses. This is a clear bright spot for VSCS.

Humanities

The Humanities area of focus produces a lot of student credit hours across the three institutions, and relative to other areas, faculty student credit production is on the higher end at 382 and has not changed over time. However, the programs themselves are smaller. VSCS should consider how the programs in this area of focus contribute to mission, eliminating programs that are not strong or not aligned, and strategically investing in programs that are most mission critical.

Invest

- HistoryBA is large, growing, and has a high retention rate. Efforts should be made to understand why the matriculation rate is low and how the graduation rate could be improved.

Optimize

- Creat WritBF, EnglishBA, and LiteratureBA, while not identical programs, do share some commonalities. VSCS should offer an English Bachelor's degree that optimizes the strengths across these different degree programs.
- InterdisBA/BS is small but has historically produced a lot of degrees. MultidiscBS is large and similarly successful in degree production. Efforts should be made to streamline these programs into a single offering.

Eliminate

- Area StudiesBA is too small to support continuation. It could potentially be absorbed by another degree offering in this area.
- InterdisMA is too small to support continuation. It could potentially be absorbed by another degree offering in this area.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Area StudiesBA	B2	Liberal Arts Index	10.2	28%	54%		80%	9	Eliminate
Creat WritBF	B2	Liberal Arts Index	26.8	28%	75%		36%	22	Optimize
EnglishBA	B2	Liberal Arts Index	25.2	21%	68%		41%	25	Optimize
Gen StudAA/AAS	B1	A	29.0	20%	42%	66%			Optimize
HistoryBA	A	Liberal Arts Index	56.2	20%	73%		49%	60	Optimize
InterdisBA/BS	B2	Liberal Arts Index	19.0	17%	56%		41%	91	Optimize
InterdisMA	C	C	4.6	58%	48%		33%	5	Eliminate
Leadership MA	(blank)	A	New Program	75%	67%				New Program

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
LiteratureBA	C	Liberal Arts Index	31.0	13%	62%		53%	26	Optimize
MultidisBA	A	Liberal Arts Index	100.4	37%	77%		51%	99	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Humanities	Average	Change over Time
Full-Time Faculty FTE	33.6	-9.7
Overload Faculty FTE	5.1	1.0
Part-Time Faculty FTE	26.7	-0.1
Total Faculty FTE	65.4	-8.8
Average Student Credit Hours	25,005	-3,457
Student Credit Hours per Faculty FTE	382.1	-1.8

Feedback:

rpk heard from one faculty member who felt that Interdisciplinary studies programs, including NVU's Interdisciplinary Studies program, do not belong under the focus area Humanities. They suggested that there should be a separate Interdisciplinary focus area. rpk has elected to retain interdisciplinary studies within the Humanities area of focus.

Math and Science

The Math and Science area of focus provides numerous opportunities for optimization. This is an area with overlap across the three institutions. The area has a significant number of faculty and utilizes a high level of faculty overload, despite a decline in student credit hours. Streamlining degree offerings and eliminating duplication should lead to large reductions in faculty overload.

Invest

- No recommendation to invest.

Optimize

- Atmos SciBS is large but growth is declining, and matriculation rates could be higher given the specificity of the program. Optimization efforts should focus on improving matriculation to support program growth.
- Biology BA/BS and MathBA/BS are areas with significant duplication of effort across the three institutions.
- Ecol StudBA and Environ SciBS both perform well enough on a few indicators, but neither are strong enough to be candidates for investment. Optimization efforts should focus on improving student matriculation and completion.

Eliminate

- All programs for elimination in this area have low enrollment, low degree production, and low or average labor market demand.
- ChemistryBS is recommended for elimination as a program. Even within a program elimination, however, VSCS would continue to offer needed chemistry courses.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Atmos SciBS	B1	(blank)	68.4	23%	80%		56%	39	Optimize
BiologyBA/BS	A	B	102.8	17%	70%		44%	89	Optimize
ChemistryBS	B2	B	10.4	24%	64%			7	Eliminate
Climate SciBS	B2	(blank)	2.3	6%	100%				New program
Ecol StudBA	B2	B	16.8	44%	71%			28	Optimize
Environ SciBS	B1	B	64.4	15%	68%		50%	51	Optimize
ForestryAAS	B2	C	6.0	45%	71%			3	Eliminate
Math and StatsBA/BS	B2	B	3.8	27%	67%		40%	5	Optimize
MathAS	(blank)	B		0%					Optimize
MathBA/BS	B1	B	48.4	16%	73%		57%	52	Optimize
Natur Sci PreBS	C	(blank)	15.6	25%	52%		32%	7	Eliminate
Sustain StudBS	C	Liberal Arts Index	8.2	11%	50%		67%	6	Eliminate
Wildlife ConservBS	(blank)	C	New Program	71%	80%				New program

Area of Focus Data from Academic Departments (2016-2020)

Math and Science	Average	Change over Time
Full-Time Faculty FTE	45.5	-6.9
Overload Faculty FTE	10.4	0.1
Part-Time Faculty FTE	25.6	2.6
Total Faculty FTE	81.6	-4.2
Average Student Credit Hours	26,204	-1,744
Student Credit Hours per Faculty FTE	321.3	-5.0

Feedback:

The Geology program at Castleton was excluded from this analysis because it has already been eliminated and no other geology programs remain at NVU or Vermont Tech. rpk was asked to note that there is an opportunity to consider Geology as an offering in relation to the Climate SciBS.

Professional Programs

The programs in this area are clear strengths for VSCS. While organized into an area of focus, the programs within this area do not share connection based on discipline. For this reason, looking at faculty student credit hour production as an 'area' is less helpful than in other areas. Moving forward, VSCS should evaluate the hiring needs of these programs individually, ensuring faculty are appropriately structuring and sequencing their curriculum in ways that result in full classes and improved rates of student completion.

Invest

- ConstrMgt (AAS and BS) are both larger than the median and have strong labor market demand. Student retention is also strong.

Optimize

- AutoAAS, DieselAAS, and PilotBS are all above median size and growth. All also have high student retention rates. Labor market demand does not suggest these are areas for investment, but efforts should be made to continue the success these programs have achieved to date.

Eliminate

- No recommendation to eliminate.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institutional Retention Rate	4-Yr Grad + Transfer (AA/AS)	6-Yr Graduation	Degrees Produced (5 Years)	Recommendation
AutoAAS	B1	B	37.6	58%	71%	62%		60	Optimize
Constr MgtAAS	A	A	19.6	51%	77%	64%		33	Invest
Constr MgtBS	B1	A	39.4	48%	64%		56%	56	Optimize
DieselAAS	A	C	31.4	54%	78%	73%		63	Optimize
PilotBS	A	(blank)	44	46%	70%		52%	36	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Professional Programs	Average	Change over Time
Full-Time Faculty FTE	7.1	-3.7
Overload Faculty FTE	3.1	-1.9
Part-Time Faculty FTE	4.0	2.7
Total Faculty FTE	14.2	-2.9
Average Student Credit Hours	3,370	-254
Student Credit Hours per Faculty FTE	237.0	28.7

Feedback:

rpk did not receive feedback for any programs in this area of focus.

Ski Resort Management/Outdoor Education and Adventure

This area of focus contains only one key program, the Outdoor EdBA/BS, which is a strong program for VSCS. The program should continue and be optimized for greater access where possible. The Associate degree is offered only as an 'off-ramp' for students who do not complete the Bachelor's. Despite the program being large, growth is declining and the overall student credit hours taught by full-time equivalent faculty have declined. Optimization efforts should consider current course offerings, sequencing, and faculty assignments.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institutional Retention Rate	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced (5 Years)	Recommendation
Outdoor EdAS	(blank)	(blank)	0	0%					Optimize
Outdoor EdBA/BS	B1	A	137.4	20%	76%		42%	93	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Ski Resort Management/Outdoor Education and Adventure	Average	Change over Time
Full-Time Faculty FTE	3.9	-1.4
Overload Faculty FTE	1.2	-0.4
Part-Time Faculty FTE	1.2	-1.5
Total Faculty FTE	6.4	-3.3
Average Student Credit Hours	1,770	-1,178
Student Credit Hours per Faculty FTE	277.4	-48.2

Feedback:

rpk did not receive feedback for any programs in this area of focus.

Social Sciences

The Social Sciences area of focus includes many core subject areas. Faculty student credit hour production is high relative to the other areas of focus, but most of the programs in this area of focus have low enrollment. Where programs are eliminated or streamlined, courses could still be offered to support student interest and general education requirements.

Invest

- No recommendation to invest.

Optimize

- Criminal Justice (AS and BA/BS) is an area that is offered at both Castleton and NVU. Optimization efforts include the need to align curriculum and streamline degree offerings.
- PoliticalSciBA is larger than the median, but only slightly. The program also has a low 6-year graduation rate. Optimization efforts should focus on improving completion.
- The Social WorkBSW has high student success rates and is large.
- Social Sci BA and AnthropologyBA both have low annual enrollment, but have collectively produced 57 degrees over five years. This area of focus may not be able to maintain so many low-enrolled programs. VSCS must determine which programs are mission-critical or evaluate how programs could be modified and/or combined into a different degree offering that will be more aligned to student demand.

Eliminate

- Intl Relations/AffairsBA both has low annual enrollment and only awarded two degrees over the time period.

Program-Level Data (2016-2020)

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced	Recommendation
AnthropologyBA	C	Liberal Arts Index	26.4	16%	67%		40%	24	Optimize
Archeol Geog AnthBS	(blank)	Liberal Arts Index	New Program	50%	100%				New program
Crim JusticeAS	B2	C	4.8	16%	100%	100%		10	Optimize
Crim JusticeBA/BS	B1	C	150.4	19%	66%		49%	95	Optimize
Intl Relations/AffairsBA	B2	Liberal Arts Index	6.5	24%	70%		0%	2	Eliminate
Polit SciBA	B1	Liberal Arts Index	33.0	19%	74%		30%	44	Optimize
Social Sci BA	B2	Liberal Arts Index	8.0	20%	89%		67%	33	Optimize
Social WorkBSW	B1	Liberal Arts Index	60.0	35%	74%		54%	76	Optimize

Program	Size/ Growth	Market Scan	Average Annual Enrollment	Matriculation Rate	Institution Retention %	4-Yr Grad + Transfer (AA/AS)	6-Yr Grad	Degrees Produced	Recommendation
SociolBA	C	Liberal Arts Index	26.2	18%	74%		43%	48	Optimize

Area of Focus Data from Academic Departments (2016-2020)

Social Sciences	Average	Change over Time
Full-Time Faculty FTE	13.7	-3.0
Overload Faculty FTE	3.2	0.2
Part-Time Faculty FTE	3.6	2.0
Total Faculty FTE	20.5	-0.8
Average Student Credit Hours	7,735	-737
Student Credit Hours per Faculty FTE	378.2	-20.6

Feedback:

The Crim JusticeBA/BS program is reflective of degree offerings are both Castleton and NVU (both at Lyndon and Johnson). rpk was asked to note that Criminal/Restorative Justice (RJ) at NVU Lyndon is a partner with the Vermont Corrections Academy (located in Lyndon) and the largest RJ center in New England located in St. Johnsbury. In addition, NVU Lyndon is the only university in the country offering RJ to students in the fashion and breadth that it is being offered by campus faculty. This focus on RJ is not reflected in the coding or naming of the programs, which is why it was felt a notation was necessary.

Both Castleton and NVU offer programs in Sociology. However, at NVU, Anthropology and Sociology are grouped together and the CIP codes used for NVU's degree programs resulted in the NVU students being captured as enrolling in AnthropologyBA, Intl Relations/AffairsBA, and Crim JusticeBA/BS. rpk was asked to clarify that these three programs are related to Sociology. rpk also received feedback that the ANS (Anthropology and Sociology) curriculum at NVU has been recently revised and new feeder programs are in place: an ILASS (Integrated Liberal Arts and Social Sciences) degree has been submitted for approval, a new department has been created combining Anthropology, Sociology, History, and Politics, and the NVU ANS program is merging with Castleton's AAGA/Sociology programs to enhance enrollment and retention as well as expand course offerings.

rpk's count of majors is unduplicated, meaning double majors were not counted twice in this analysis. rpk received feedback from faculty in the SociolBA program that this unduplicated count results in an under-count of majors due to students choosing to enroll in SociolBA as a second major.

Appendix A: Methodology

Establishing the Program List and Areas of Focus

The original list of all programs across all three institutions for the years of analysis resulted in a total of 741 programs that were active at one point from 2016-2020. Those 741 programs were rolled-up by combining the CIP code and degree type (Associate, Bachelor's, and Master's), resulting in a total of 127 rolled-up programs.

Some programs were excluded. The reason for those exclusions included:

- Online
- Highschool/early college
- No headcount during the analysis
- Pre-program, minor, non-academic program
- Non-degree programs, certificate programs, or anything outside of Associate, Bachelor's and Master's degrees
- Closed/discontinued programs that have no program at any of the other institutions with that same CIP code

The goal behind reorganizing existing programs into larger units - first aligning degrees similar in name, content and/or CIP code and then grouping those into 15 areas of focus - was to: (1) provide a more accurate capture of degree programs across the three institutions from 2016-2020, and: (2) avoid diluting the analysis by treating every unique program offering across the institutions as a single point of analysis.

The rolled-up programs were organized into fifteen areas of focus. The fifteen areas of focus are:

1. Agriculture, Plant and Animal Sciences
2. Athletic Training, Exercise and Health Sciences
3. Business/Accounting
4. Communications/Journalism
5. Computer Information Systems
6. Counseling and Psychology
7. Education
8. Engineering Technology
9. Fine and Performing Arts
10. Health Professions
11. Humanities
12. Math and Science
13. Professional Programs
14. Ski Resort Management/Outdoor Education and Adventure
15. Social Sciences

Labor Market Analysis

The labor market (LM) analysis seeks to connect the program offerings at VSCS to labor market demand in the State of Vermont through 2028. The analysis includes two approaches: 1) a 'LM gap analysis' that examines statewide occupational employment projections and identifies whether VSCS currently offers programs preparing students for those jobs, and; 2) a 'LM program analysis' that examines projected labor market demand for existing VSCS academic programs, to inform decisions about which programs VSCS should continue to offer.

The LM gap analysis reflects a ‘top down’ approach to identify growing occupations; determine if VSCS has ‘gaps’ in its academic program offerings; and consider whether VSCS should establish new programs to prepare workers for these new jobs.

The LM program analysis reflects a ‘bottom up’ approach that examines all academic programs VSCS currently offers and their associated employment outlook. This approach links academic pathways with the types of jobs that are typically aligned with those programs, and accessible to students with those credentials.

The information from the labor market analysis is used in conjunction with the broader program analysis (previously described) to inform academic program recommendations. The recommendation options include investing in current or new programs, consolidating programs, or eliminating programs.

Data Sources

Conducting a labor market analysis first requires linking together academic programs, academic awards (certificates and degrees), and the employment outlook for occupations. Multiple data sources were employed to construct a crosswalk between these different types of information and conduct the LM analysis, including:

- **VSCS Academic Program List** (custom; 2021) by CIP code and type of certificate/degree
- [CIP-SOC Crosswalk](#) (2010) created by the U.S. Department of Education (National Center for Education Statistics)
- **Occupational Education and Experience Requirements** (2018)⁶ produced by the U.S. Department of Labor, Bureau of Labor Statistics (BLS)
- [American Community Survey \(2019 PUMS\)](#) produced by the U.S. Department of Commerce (Bureau of Census)
- [Vermont Occupational Employment Projections](#), 2018-2028 produced by the Vermont Department of Labor

Liberal Arts IndexSM

One longstanding difficulty in linking academic programs and occupational opportunities occurs when examining the types of jobs accessible to graduates with ‘liberal arts’ degrees. Because the linkages between liberal arts programs and the labor market are not as clearly identifiable as occupational-oriented programs, rpk GROUP created a labor market index to ensure the broad labor market opportunities associated with these programs are reflected in both the LM gap and LM program analyses.⁷

Academic programs that deliver occupation-specific knowledge and skills, such as engineering and many STEM fields, often have solid demonstrated matches in the enhanced crosswalk. For example, a bachelor’s degree in nursing practice (CIP 51.3818) is easily matched to jobs in Registered Nursing (SOC 29-1171). Matching for liberal arts degrees is more difficult. The preparation provided in liberal arts fields is broadly valued in the labor market, but it’s more difficult to make direct labor market connection, or the connections in the standard crosswalk are too narrow.⁸ Many liberal arts programs in the standard CIP-SOC crosswalk match only to doctoral-level teaching opportunities. For example, Philosophy (CIP 38.0101) maps to only to ‘Philosophy and Religion Teachers’ (SOC 25-1126) which requires a doctoral

⁶ This file was sent directly to rpk GROUP from the U.S. Department of Labor. If you would like access, please email rpk GROUP at info@rpkgroup.com.

⁷ Liberal arts degrees are clearly shown to have labor market value even though it its more difficult to make direct connections between these program and occupations. <https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/Liberal-Arts-ROI.pdf>

⁸ For example, in standard crosswalk a Philosophy degree links only links to an occupation as a philosophy profession. While this may be accurate for students pursuing a PhD in philosophy, students earning a bachelor’s degree in philosophy access many different types of careers.

degree. But certainly, many students earn bachelor's degrees in philosophy and other liberal arts fields which prepare them to become gainfully employed in a variety of occupations.

rpk GROUP created a liberal arts index to account for the varied employment opportunities available to liberal arts graduates and incorporated it into the custom CIP-SOC crosswalk. The method identifies 'liberal arts' programs, identifies jobs (SOC codes) accessible to students with liberal arts degrees, and applies the index to all identified liberal arts programs at the associate and bachelor's degree award level.⁹

Analysis Groups & Methods. The labor market analysis begins by organizing the employment outlook into three analysis groups. This organizational methodology includes; 1) projected growth in new jobs (percent change), and; 2) projected number of job openings (annual average). By capturing both directional job growth and the magnitude of employment opportunities, impact of small, but fast-growing occupations is moderated while ensuring slow-growing occupations with providing ample job openings are considered. This approach reflects a modified version of the methodology used by the Vermont Department of Labor to identify high growth and declining occupations.¹⁰

Analysis Groups: The threshold for above/below average new job growth is 1.8% and for above/below average annual job openings is 79.5.

- *Group A:* Above average new job growth & job openings
- *Group B:*
 - Above average new job growth & below average job openings
 - Below average new job growth & above average job openings
- *Group C:*
 - Below average new job growth and below average job openings

Gap Analysis. The gap analysis is conducted by assigning each occupation to one of the three analysis groups. Group A includes occupations with a strong employment outlook for Vermont. Within this group, the academic program(s) (CIP code and award level) associated with each occupation are identified and then examined to determine whether VSCS already offers such a program. Occupations without a VSCS program are potential candidates for new program creation.

Program Analysis. The program analysis is conducted by evaluating the employment outlook associated with existing VSCS programs. The occupational employment projections associated with each VSCS program are first aggregated into one record per program.¹¹ The employment growth outlook is then calculated and each VSCS program is assigned into one of the three analysis groups. Programs in Group A have a strong economic basis for continuation; Groups B and C require additional review in the context of other program information, such as student demand.

Geographic Analysis

rpk evaluated the distribution of student geographic location across programs and groupings for students enrolled in programs operating at a college or university location, excluding programs that operate virtually. The intent with this analysis is to provide decision makers with a sense of how proximate currently enrolled students are to existing programs, and by extension, coursework and faculty. Proximity was measured for both in-state and out-of-state students, albeit using different metrics. The data and methods used to calculate these metrics are described below.

⁹ Separate indexes were created for bachelor's degrees and associate degrees. The liberal arts programs and methodology are the same, but the accessible occupations identified for each degree type were different.

¹⁰ <http://www.vtmi.info/decliningandhighdemandocc.pdf>

¹¹ Program that are linked both to an independent occupation and the liberal arts index are further examined to ensure that occupation is not duplicated when aggregating the employment projections data.

Data & Methods

The geographic analysis uses information contained in the fall student headcount files provided by VSC. These files included a census of matriculated students to NVU (Lyndon & Johnson locations), Vermont Technical College, and Castleton University, and information on the primary program assignment and contact information, including state of residence and Zip Code for this residence.

Student-level location information were merged with a national database that includes an assigned latitude and longitude for each US-based Zip Code. This merge assigned a latitude/longitude location for each student's location.¹² A latitude/longitude location was also assigned to programs that have a physical location (programs that do not operate entirely as virtual or distance education programs) based on the Zip Code of location of program assignment (college or university location, or satellite program site).

For in-state students (i.e., students with a state of residence designated as Vermont), the number of miles between a student's home location *and* program location was calculated. This was accomplished using the STATA statistical program's "GEODIST" routine. Specifically, this routine calculates the number of miles – "as the crow flies" – between the latitude and longitude for student and program location.

Metrics

In-state students

An in-state student's geographic proximity is reported according to four categories, which group student distance from their primary program assignment into four categories:

- 1) Less than 30 miles
- 2) 30 to less than 50 miles
- 3) 50 to less than 80 miles
- 4) Equal or more than 80 miles.

Frequency percentages are reported for each category, broken out by: a) institution and institution location; b) program groupings, and; c) program assignment within groupings.

Area of Focus Analysis of Course and Faculty Data

Course and faculty data were provided for five academic years (2015-16 through 2019-20) for each of the three institutions and include all terms.

Both data sources were reviewed and cleaned to make sure the organizational structure was consistent. Where departments did not cleanly align between the course data and faculty data, the departments were either revised or excluded from the analysis if not material or relevant to this analysis. Table 13 contains these department level revisions and exclusions.

¹² The latitude and longitude provided for each Zip Code is assigned based on the basis of the geographic centroid of the Zip Code. Implicit in this assignment, however, is some general error in precision, particularly when Zip Codes cover large geographic areas.

Table 13: Course and Faculty Analyses Revisions and Exclusions

School	Department	Revision
Castleton University	CREG - Registrar	Excluded from course & faculty analyses
Northern Vermont University - Johnson	JIGP - Interdisciplinary Grad Programs	Combined with JINT - Interdisciplinary Studies
	JFPA - Fine & Performing Arts	Combined with JPAR - Performing Arts
	JEDP - External Degree Program - Jsc	Excluded from course & faculty analyses
	JREG - Registrar	Excluded from course & faculty analyses
Northern Vermont University - Lyndon	LEDS - Secondary Education	Combined with LEDU - Education
	LGRE - Graduate Education	Combined with LEDU - Education
	LDGA - Digital & Graphic Arts	Combined with LVIS - Visual Arts
	LFLG - Obsolete Foreign Languages	Excluded from course & faculty analyses
	LREG - Registrar	Excluded from course & faculty analyses
Vermont Technical College	TIST - Info Science Tech	Combined with TCIS - Computer Information Systems
	TGEN - General Education	Combined with TENG - English
	TFRS - Forestry	Combined with TAGR - Agricultural
	TELM - Electormechnical Eng Techn	Combined with TECT - Electrical & Computer Tech
	TFSC - Fire Science	Combined with TPMD - Paramedicine
	TDSL - Diesel Power Technology	Combined with TATT - Ground Transportation Services
	TGTS - Grnd Transportation Services	Combined with TATT - Ground Transportation Services
	TAGI - Agricultural Institute	Excluded from course & faculty analyses
	TCEU – VTC Community Education	Excluded from course & faculty analyses
	TCTE - VTC Career Tech Ed	Excluded from course & faculty analyses
	TREG - Registrar	Excluded from course & faculty analyses
	TSDT - Sustainable Design	Excluded from course & faculty analyses
	TTED - Technical Education	Excluded from course & faculty analyses
TTEX - Technology Extention	Excluded from course & faculty analyses	

Next, the revised set of departments were assigned to one of fifteen areas of focus. Table 14 shows how the departments of each school were classified.

Table 14: Assignment of Departments to Areas of Focus

School	Department	Area of Focus
Castleton University	CART - Art	Fine and Performing Arts
	CBUS - Business Admin.	Business/Accounting
	CCOM - Media & Communication	Communications/Journalism
	CEDU - Education	Education
	CENG - English	Humanities
	CHGP - History Geography Econ Pol Sci	Humanities
	CILA - Introduction to Liberal Arts	Humanities
	CMAT - Mathematics	Math and Science
	CMUS - Music	Fine and Performing Arts
	CNAS - Natural Sciences	Math and Science
	CNUR - Nursing	Health Professions
	CPED - Hlth, Human Movement & Sport	Athletic Training, Exercise and Health Sciences
	CPSY - Psychology	Counseling and Psychology
	CSSC - Sociology Social Work & CRJ	Social Sciences
CTHA - Theatre Arts	Fine and Performing Arts	
Northern Vermont University - Johnson	JART - Art	Fine and Performing Arts
	JBEH - Behavioral Sciences	Counseling and Psychology
	JBUS - Business	Business/Accounting
	JCMH - Johnson Clinical Mental Health	Counseling and Psychology
	JEDU - Education	Education
	JEHS - Environmental & Health Science	Math and Science
	JHUM - Humanities	Humanities
	JINT - Interdisciplinary Studies	Humanities
	JMAT - Mathematics	Math and Science
	JPAR - Performing Arts	Fine and Performing Arts
	JW&L - Writing & Literature	Humanities
Northern Vermont University - Lyndon	LATM - Atmospheric Sciences	Math and Science
	LBUS - Business Administration Edu	Business/Accounting
	LEDU - Education	Education
	LEJA - Electronic Journalism Arts	Communications/Journalism
	LENG - Eng, Phil and Film	Humanities
	LGEN - General Studies	Humanities
	LLIB - Liberal Studies	Humanities
	LMAT - Mathematics & Computer Science	Math and Science

School	Department	Area of Focus
	LMPA - Music and Performing Arts	Fine and Performing Arts
	LMRM - Mountain Recreation Management	Ski Resort Management/Outdoor Education and Adventure
	LPSY - Psychology and Human Services	Counseling and Psychology
	LSCI - Natural Sciences	Math and Science
	LSSC - Social Science	Social Sciences
	LVIS - Visual Arts	Fine and Performing Arts
	LXSC - Exercise Science	Athletic Training, Exercise and Health Sciences
Vermont Technical College	TAER - Aeronautical	Professional Programs
	TAGR - Agricultural	Agriculture, Plant and Animal Sciences
	TARE - Architectural Engineering	Engineering Technology
	TATT - Ground Transportation Services	Professional Programs
	TBUS - Business	Business/Accounting
	TCET - Civil & Environmental Eng Tech	Engineering Technology
	TCIS - Computer Information Systems	Computer Information Systems
	TCPM - Construction & Management	Professional Programs
	TDHY - Dental Hygiene	Health Professions
	TECT - Electrical & Computer Eng Tech	Engineering Technology
	TENG - English	Humanities
	TLAH - Lndscape Design & Sustain Hort	Agriculture, Plant and Animal Sciences
	TMAT - Mathematics	Math and Science
	TMEC - Mechanical Eng Technology	Engineering Technology
	TNUR - Nursing	Health Professions
	TPMD - Paramedicine and Fire Science	Health Professions
	TRAD - Radiologic Science	Health Professions
	TRSP - Respiratory Therapy	Health Professions
	TSCI - Science	Math and Science
TVET - Veterinary Technology	Agriculture, Plant and Animal Sciences	

Course Analysis

The course analysis shows how efficiently an institution manages their course offerings at various levels within their organization – by institution, department and by course level (lower, upper and graduate). The course analysis helps institutions identify sections with very low enrollment.

Courses that do not have regular group instruction (independent study, internship, thesis, dissertation, study abroad, field experience, etc.) are excluded from this analysis. These courses involve independent student work as the primary mode of instruction supplemented by required interactions with a faculty member acting as an advisor or mentor. Table 15 shows the course analysis exclusions.

Table 15: Course Analysis Exclusions

Section Location	CCFS - Castleton Center for Schools
	CCON - Castleton Consortium
Instructional Method	EVT - Event
	INS - Independent Study
	PRA - Practicum
	CLN - Clinical
	IDV - Individualized
	INT - Internship (Externship/Co-Op)
	TRV - Travel
TUT - Tutorial/Modular	

Note: Cross-listed courses (a course that has multiple sections but is delivered at the same time by the same instructor) were included in the analysis except in the average class size and fill rate calculations.

Table 16: Course Analysis Metrics

Average Class Size	Total number of students enrolled divided by total course sections
Total Student Credit Hours & Sections	Trend analysis of total student credit hours generated as of census date and the total number of sections

Faculty Analysis

The faculty analysis shows how faculty resources are being used relative to student credit hour production by institution and department. The analysis includes all full-time and part-time faculty as well as overload assignments for full-time faculty. Graduate teaching assistants, however, are not included. Also, the courses that were excluded in the course analysis are added back in for the faculty analysis except for those at Castleton Center for Schools and the Castleton Consortium.

Table 17: Faculty Analysis Metrics

Student Credit Hours per Faculty FTE	Total number of student credit hours generated as of census date divided by the total faculty FTE (full-time equivalent) 1 FTE = 24 credits
--------------------------------------	--