COMMENTARY

A Pathway to Systemic Reform: VIP Programs and the VIP Consortium

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Abstract

Vertically integrated projects (VIP) compose a large-scale, long-term, team-based, multidisciplinary, for-credit model for undergraduate research, scholarship, and creative inquiry. Vertical integration refers to team composition, which includes undergraduates of different years in school. Adoption of the VIP model continues to increase, driven by the desire to scale up high-impact practices and by evidence of success with equity, leadership growth, job placement gains, and collaboration across disciplinary lines. Since its establishment in 2014, more than 50 institutions have joined the VIP Consortium, with 30 in the United States and 22 in sixteen other countries. This commentary provides an overview of the VIP model, resources for prospective sites, and suggestions for future research.

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Vertically integrated projects (VIP), the focus of this special issue, compose a large-scale, long-term, team-based, for-credit model for undergraduate research, scholarship, and creative inquiry (URSCI). Vertical integration refers to the composition of VIP teams, which include undergraduates of different academic ranks (or years in school) as well as the faculty who mentor them. Teams at institutions with graduate programs also can include graduate and postdoctoral students. Vertically integrated teams occur organically when faculty mentor a large number of students over many semesters, with new students joining the group as others graduate or leave, and with experienced students mentoring new members, coordinating work, and serving as subteam leaders. Peer mentorship augments student–faculty interaction, enabling faculty to mentor many more students than is possible in one-on-one, apprentice-style URSCI models.

Although the term "VIP" can be used to describe a single team, within the VIP Consortium (VIPC) the term "VIP model" refers to a broader set of practices that support institutionalization. Adoption of the VIP model continues to increase, driven by the desire to scale-up high-impact practices and by evidence of success with equity in enrollment, active collaboration across disciplinary lines, measurable leadership growth, and higher odds of job placement prior to graduation (Sonnenberg-Klein 2024; Sonnenberg-Klein, Abler, and Coyle 2018b; Sonnenberg-Klein et al. 2017; Sonnenberg-Klein and Coyle 2024b). More than 50 institutions have joined the nonprofit VIP Consortium to enable collaboration on program adoption, effective practices, and lessons learned. The VIPC includes 30 programs in the United States and 22 programs in sixteen other countries around the world, with every continent represented. This includes five in South America and the Caribbean, two in Africa, one in Australia, four in Asia, two in the Middle East, and eight in Europe. There also are more than 29 institutions in various stages of initiating VIP.

Given the ongoing growth and evidence of the scalability (Figures 1 and 2) and benefits of VIP, this issue provides a timely look at the impact of VIP on higher education around the world. To provide context for the studies presented in this special issue, this commentary provides

an overview of the VIP model, resources for prospective sites, and suggestions for future research.

VIP Model Evolution

Purdue University pioneered the use of large-scale, long-term, vertically integrated teams in the Engineering Projects in Community Service (EPICS) program, which was established in 1995 (Coyle, Jamieson, and Dietz 1996; Coyle, Jamieson, and Oakes 2005). A weakness in prior service-learning programs was the lack of continuity in student projects, often causing significant frustration of the community service organizations involved. EPICS addressed these problems by bringing together students from different disciplines, enabling each student to participate for multiple semesters, and having experienced students mentor new members under faculty guidance. The program received the 2005 Gordon Prize from the National Academy of Engineering, a high honor in engineering and technology education. Similar to the VIPC many years later, an EPICS consortium was established to support dissemination, institutionalization, and effective practices for the EPICS model at institutions around the world, and currently 39 institutions are listed on the EPICS Consortium website ("EPICS University Consortium" 2025).

Faculty recognized the value of large-scale, long-term, vertically integrated teams in EPICS, but the disconnect between faculty reward structures and EPICS mentorship limited program scalability. To overcome this limiting factor, in 2001, a separate Purdue program was established to embed student teams in faculty research (Coyle, Allebach, and Krueger 2006). Instead of being a form of service, VIP teams became integral parts of faculty research portfolios. The VIP teams had the disciplinary depth, multidisciplinary breadth, and continuity necessary to make meaningful contributions to the projects. Furthermore, faculty could include VIP as broader impacts, education, and workforce development sections in proposals. This cultivated long-term faculty engagement, supporting program sustainability.

To enable more students to benefit from the VIP model, and to give faculty access to students from a wider range of majors, Georgia Institute of Technology established the first campus-wide, broadly multidisciplinary VIP Program in 2009 (Abler et al. 2011; Baxter et al. 2011). VIP projects are now found in every college and the majority of departments at Georgia Tech, and every VIP team is multidisciplinary (Sonnenberg-Klein and Coyle 2024a). There are more than 100 VIP projects at Georgia Tech ("Vertically Integrated Projects" n.d.); 2600 students were registered for VIP credit in spring 2025, and the average team size is approximately 25 students.

Essential Elements

In 2014, at the first convening of what would become the VIPC, representatives from 14 institutions identified seven key elements of the VIP model (Aazhang et al. 2017). These elements relate to the projects, the curriculum, and the logistics of administering a VIP Program.

Projects

A cornerstone of the VIP model is that projects are based in faculty mentors' scholarly and exploratory work. VIP is meant to enhance faculty portfolios, but faculty motivations for team establishment vary. Some instructors need access to students from other majors; some want to try new ideas in low-stakes settings; still others are interested in service learning, which harkens back to the model's development with EPICS. Whether projects are embedded in faculty research, design, service, or other creative endeavors, when faculty benefit from their teams' work, it cultivates long-term engagement and the scalability of the program.

The VIP model originated in engineering, in which most programs of study require capstone or culminating design projects. VIP differs from the standard courses because VIP projects are long-term and large-scale, continuing for many years, even decades. VIP is similar to an internship. Students join and get up to speed on a project as they would in the workplace, collaborate with teammates, document their contributions so others can build upon their work, and the work continues long after they leave the team. The large-scale aspect relates to the size of the team, with an average team size of 25 at Georgia Tech.

Within the team-based context of VIP, learning outcomes include both disciplinary and professional skills, because professional skills are necessities for large teams. Without effective communication, collaboration, and peer mentoring, teams would take on hub-and-spoke structures with the instructor at the center, an ineffective use of instructor time and a lost opportunity for student growth. Instead, VIP teams with subteams and peer mentoring enable students to learn and create in community. This leverages the social interaction essential to project-based learning (Krajcik and Blumenfeld 2005). Multiple studies have shown measurable gains in professional skills. Analysis of institutional exit surveys show that, compared to nonparticipants, VIP participants more strongly agreed that their Georgia Tech educations contributed to their ability to work in multidisciplinary teams, ability to work with people from diverse backgrounds, and understanding of technologies related to their fields (Ludlum 2015). Supporting these findings, social network analysis of peer evaluations showed that, within VIP, students interacted more often with students from other majors and of other races or ethnicities (Sonnenberg-Klein et al. 2017). It is important to note that professional skills develop over time. When students participate multiple semesters, they take on greater leadership

responsibilities each semester. Longitudinal analysis of peer evaluations showed growth in student leadership roles in both the second and third semesters, representing cumulative gains over time (Figures 3 and 4; Sonnenberg-Klein and Coyle 2024b). Student growth may continue through the fourth and later semesters, as subteam leaders work more closely with faculty and graduate students, but these interactions may be less visible to teammates and not reflected in peer evaluations.

Directly related to student professional development, among students seeking employment after graduation, VIP was associated with triple the odds of having found a job prior to graduation (Sonnenberg-Klein 2024). The gains were comparable to gains associated with having done an internship (Figure 4).

Although multidisciplinarity is a hallmark of programs across the VIPC, members have agreed and reaffirmed that multidisciplinary teams are encouraged but not required. The VIPC recognizes that VIP Programs can be established at the departmental level, and that multidisciplinarity may not be possible in early stages. However, large-scale projects tend to be multidisciplinary by nature, leading to multidisciplinary teams and programs (Figure 5).

Curriculum

A key component of program success and institutionalization is the incorporation of VIP into the curriculum. VIP is offered as a graded, credit-bearing course, with students receiving letter grades instead of pass/fail or satisfactory/unsatisfactory. This is important because it holds students accountable for their performance on the team. Although not voted on by the VIPC, VIP is usually offered for one-third to one-half the number of credits of a typical 3- or 4-credit course. In the US semester system, this means 1 or 2 credits, enabling students to participate for multiple semesters before using up the free or technical electives available in their curriculum.

Curriculum is also an important part of student engagement in VIP. The VIPC maintains that, to support long-term student engagement, students need to be able to participate and earn credits toward their degrees for at least two years. This represents roughly 6 VIP credits (1 the first two semesters and 2 the second two) that would need to be able to count toward degree requirements in meaningful ways, potentially as free electives, technical or within-major electives, or as a pathway for an existing requirement. Beyond creating space in the curriculum for VIP, analysis of student enrollment showed a strong correlation between institutional policies and student persistence in the program (Sonnenberg-Klein, Abler, and Coyle 2018a). A policy that offered VIP as one of multiple pathways in a multisemester design sequence yielded the highest persistence and participation rate. Policies with the second highest persistence allowed VIP credits to count as within-major electives when a minimum number of credits were earned, incentivizing multiple semesters of participation.

FIGURE 1. Scalability

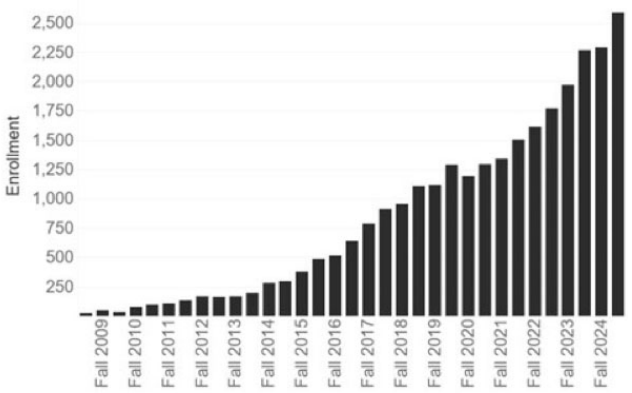
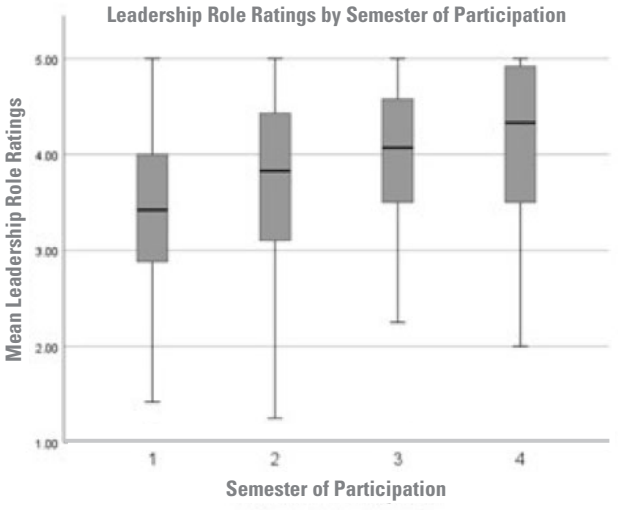


FIGURE 2. Team Picture

FIGURE 3. Leadership Growth Over Time



Note: Originally appeared in (Sonnenberg-Klein and Coyle 2024b). Reused with permission.

FIGURE 4. Job Placement

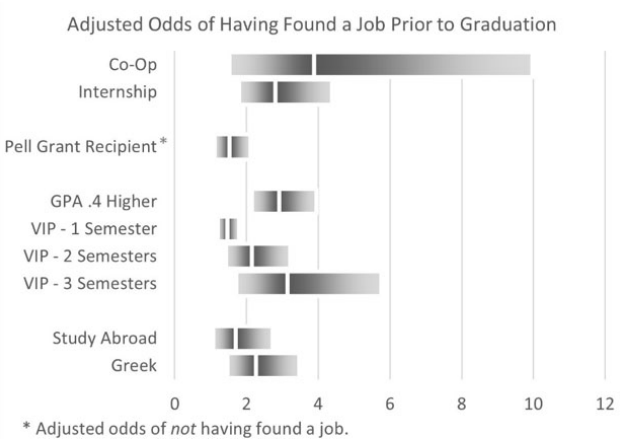


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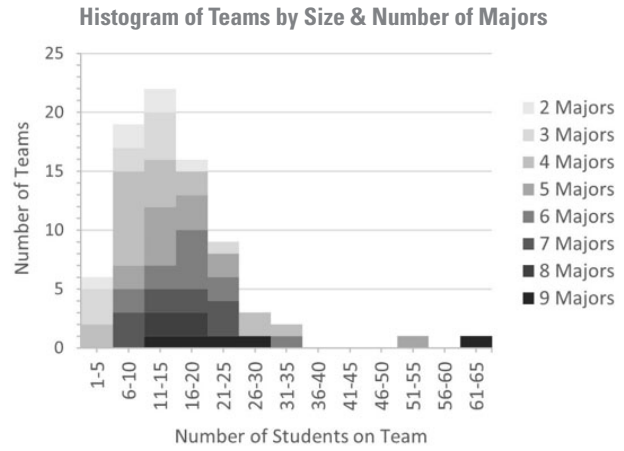
FIGURE 5. Multidisciplinarity



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Logistics

VIPC members agree that VIP programs require dedicated classroom and meeting spaces. This enables instructors to have consistent meetings from semester to semester (without jockeying with centralized course scheduling systems), and to provide space for VIP subteams to meet outside of scheduled team meetings.

The final element identified by the VIPC is that participation be based on mutual interest. Faculty should not be required to establish teams, and students should not be required to participate. Students and faculty come together in VIP with a different mindset than in a regular course: they are interested in the project, and they want to work on it together. This creates common ground among people who have not met, and it supports meaningful relationships between faculty and students. Kuh (2008) attributes much of the benefit of undergraduate research to student–faculty interaction, and student–faculty interaction is prominent in theories of student development and success (Astin 1999; Kim and Sax 2017; Weidman 1989). The value of faculty mentorship enabled by VIP should not be underestimated.

Access

A key aspect of VIP that is widely discussed but has not been voted on by the VIPC is student access. The model was initially developed to enable all students and researchers to work together. To this end, many sites do not screen students by GPA, résumés, interviews, or letters of recommendation. At Georgia Tech, student selection is based on a short explanation of student interest (350 characters with spaces), major, number of credits (1 or 2), and academic rank. (The non-résumé framing for the short answer question was borrowed from Boise State University.) This has yielded equity in enrollment across multiple sites (Sonnenberg-Klein et al. 2023) and comparatively higher participation in VIP among Pell grant recipients and transfer students than other programs (Sonnenberg-Klein 2024; Sonnenberg-Klein, Abler, and Coyle 2018b).

A very important aspect of VIP is that everyone who participates does so because they choose to. Faculty benefit by requesting VIP teams to work with them and mentoring them as they contribute to the team's research efforts. The students choose projects to join that are of interest to them. Each VIP team is therefore a long-term community of people who share a common interest and collaborate to advance the project. This is perhaps the most important contributor to the scalable nature of VIP within an institution. This has, in turn, led other universities to create VIP programs, of which there are now more than 50.

VIP Consortium

The five initial VIP sites—Purdue University, Georgia Tech, the University of Strathclyde, the University of Michigan, and Texas A&M—formed the initial, informal VIPC to develop VIP within their institutions and explore opportunities for further dissemination. This resulted in a proposal in 2015 to the Leona M. and Harry B. Helmsley Charitable Trust that provided funds for research on VIP, an annual meeting of the consortium, and expansion of the VIPC. The VIPC expanded by 2018 to 18 institutions.

The nonprofit VIP Consortium, a US 501(c)(3) entity that is incorporated in the State of Georgia, was launched in 2019 to assist in raising resources to continue the annual consortium meeting, to foster research on the VIP program, and to coordinate with all VIP institutions to determine the essential elements of VIP that enable success in a wide variety of contexts. This effort has included trademarking the phrase "Vertically Integrated Projects" and developing a website (Vertically Integrated Projects Consortium, n.d.) that keeps a list of VIP sites that have

successfully adopted the program or are working toward implementing the essential elements of VIP.

The goal of the VIP Consortium is to raise resources to assist current VIP sites and foster the development of new programs. Recent successes include grants from the Lumina Foundation, the Silicon Valley Community Foundation, and the Kern Foundation. With support from Lumina, the VIPC is developing grading and assessment software tools that will be available to all VIP sites. There was also support for the 2025 consortium meeting at Georgia Tech, where members reviewed progress and provided input on tool development.

Beyond establishing and conducting research on their own programs, program directors and faculty from across the VIPC have worked to build community and support each other. Their contributions include guidance for the development of the essential elements of the VIP program, hosting and participating in VIP innovation showcases and competitions, identifying and mentoring new VIP sites, developing special interest groups such as VIP for Sustainable Development (VIP4SD), and offering monthly office hours for institutions interested in VIP. The many successful VIP sites and their commitment to the development of the program are one of the most significant resources of the VIP Consortium.

Future Directions

A strength of VIP has been its grassroots structure, developed and implemented by faculty in response to student and faculty needs. Programs have been established as resources allowed, with a focus on operations and institutionalization. As a result, program establishment has outpaced education research, and there is much to study!

The first and most pressing need is broad examination of the benefits of VIP participation. Although many instruments have been developed to assess URSCI, none have been developed for VIP. The largest studies to date have relied on secondary data: peer evaluations and institutional exit surveys. Qualitative methods are needed to explore and identify the ways in which students and faculty benefit from participation. Through the VIPC, instruments developed at a single institution can be tested across multiple institutions, and multiple institutions can collaborate on instrument development.

The multidisciplinary context of VIP also is worth examining. A study by Kolmos et al. (2024) outside of the VIP context showed differences in student team experiences based on how disciplinarily narrow or broadly interdisciplinary they were. At the same time, on student teams the degree of coupling between majors varies by program and team (Kolmos et al. 2024; Sonnenberg-Klein et al. 2017). A metric was developed to quantify team multidisciplinary, but it was based on a single institution (Sonnenberg-Klein and Coyle 2024a). A more generalized metric and a method that accounts for the degree of coupling between majors would be of use.

The findings of higher job placement among VIP students have been of particular interest (Sonnenberg-Klein 2024). The study made use of institutional exit surveys, and there is interest in replicating it at other institutions. On the qualitative side, researchers also may draw on signaling theory to examine how (or if) VIP participation affects the ways in which students present themselves to employers (Anderson and Tomlinson 2020; Tomlinson and Anderson 2021).

There also is a need for more extensive research on the equity of the VIP model. Analysis across five institutions showed equity across the pooled sample, but results varied by site (Sonnenberg-Klein et al. 2023). Because contexts, populations, and implementations vary by institution, VIP programs may not all achieve the same degree of equity. Further, substantial research could be done on the mechanisms underlying equity and inequity, knowledge of which has only been speculative to date.

Conclusion

VIP benefits both faculty and students. Its ability to work in many types of institutions and across many disciplines, its scalability, and the collaboration of sites through the VIPC offer a unique opportunity to achieve systemic reform of higher education. Perhaps the most significant impact systemic reform of this scale may have is that undergraduates participate as full partners alongside faculty and researchers. As a VIP alumnus described, "These interactions have a different dynamic than the typical student–teacher relationship, as students are more like collaborators than pupils. The ability to work directly with researchers and graduate students was fantastic" (Reece 2014). Every student deserves this kind of experience, and scaling across the VIPC implies that this is possible.

Institutional Review Board

Not required

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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