From the Editors

By pushing the boundaries of collaboration, consortia have the opportunity to engage in partnerships that improve their overall mission. This publication emphasizes the high quality of the projects that consortia throughout the country have initiated in an effort to enhance the effectiveness of higher education. In each chapter the authors highlight their projects and institutions working together, and even though unique in structure, these projects can be duplicated in other regions of the United States and beyond. Many of the chapters stress the importance of the collaborative process, leading us to believe that when we share information and knowledge, we have a unified vision of success for all partners associated with the consortium. Many of the projects discussed in this publication clearly demonstrate the ingenuity and entrepreneurship that exists in consortia and how they have had a major impact on higher education. The efforts of these consortia to promote significant cooperation, both internally and externally, are admirable and do give us a sense of what consortia can accomplish. The authors collectively share their expertise and lessons learned to provide a foundation to enrich the future for all consortia.

VIRGINIA TIDEWATER CONSORTIUM FOR HIGHER EDUCATION

ASSOCIATION *for* **COLLABORATIVE LEADERSHIP**
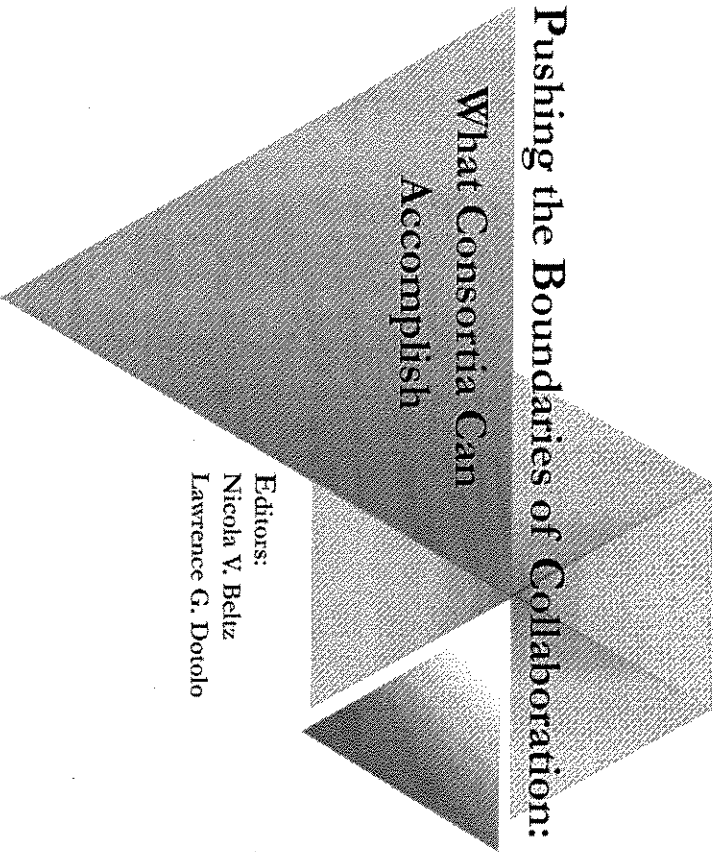
Pushing the Boundaries of Collabor

What Consortia Can Accomplish

Editors:
Nicola V. Bel
Lawrence G.

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Editors' Notes

Consortia throughout the United States are involved in projects which have advanced higher education and pushed the boundaries of cooperation. Many consortia have initiated and developed projects and activities which are truly unique to higher education and provide a distinct impact with their members. This publication discusses in detail what consortia have accomplished and how their activities have affected their members and, in some cases, their communities. The authors represent consortia from all areas of the United States, realizing that the mission of every consortium is very different, the contributions of their programs and experiences reveal that collaborative arrangements among institutions of higher education have significant value. Consortia are agile organizations that can respond to immediate needs and develop model projects that can advance cooperation and enhance efficiencies among the member institutions.

The editors and authors of this volume strongly believe that cooperation in higher education is best achieved through consortia. Consortia offer an infrastructure that is ideal for initiating and implementing programs that require resources or commitments. Working in a cooperative setting, gives institution the ability to meet demands, solve problems, create new activities, and expand on successful model projects. The authors discuss a variety of projects such as promoting public policy, global education, environmental programs, undergraduate research and collaboration, programs for students with disabilities, foreign language study, health care, community outreach and advancing the workforce through registered apprenticeships. Not many colle and universities can devote their institutional resources to focus on one particular project, but by sharing costs and leveraging resources, colleges working through consortia can enhance their programs.

This publication is a joint project between the Virginia Tidewater Consortium for Higher Education (VTC) www.vtc.odu.edu, a consortium of fourteen high education institutions, located in the Tidewater region of Virginia and the Association for Collaborative Leadership (ACL), acl.site-ym.com, the national and international organization of consortia.

Nicola V. Beltz
Lawrence G. Dotolo
Editors

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personnel and campus investments and priorities change regularly. The CIC SROP is an example of a program that has been modified over time to reflect the reality of the campus cultures, while maintaining a focus on positive program impact and outcomes. In analyzing the SROP project, the CIC staff has developed a framework through which to better understand all projects.

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Collaborative Strategies for Enabling and Enhancing Language Teaching and Learning

Neal Broadus Abraham

When colleges and universities collaborate in faculty hiring, course syllabi and pedagogical strategies, they succeed in offering a wider range of courses and opportunities for their students, particularly for teaching and learning languages.

Setting the Stage

The five campuses of the Five College Consortium in Western Massachusetts (Amherst College, Hampshire College, Mount Holyoke College, Smith College and the University of Massachusetts Amherst) offer seventy-three different languages and major dialects to their students https://www.fivecolleges.edu/languages through a variety of organizational, curricular, staffing and pedagogical strategies. Among these different languages the campuses offer nineteen languages in traditional classroom settings at one or more of the campuses (the number in parentheses is the number of campuses offering at least elementary-level, classroom-based courses): American Sign Language (1), Arabic (5), Catalan (1), Chinese (5), classical Greek (4), Hebrew (3), Italian (3), Japanese (4), Korean (3), Latin (4), Ojibwe (1), Polish (1), Portuguese (3), Quechua (1), Russian (4), Sanskrit (1), Spanish (5) and Swedish (1), and Yiddish (2). Because of the proximity of each campus to the other four of the campuses (less than a half-hour bus ride each way) and a no-charge arrangement for cross-registration for undergraduates of the five campus, these elementary, intermediate and advanced classroom-based language courses are available to many students from all five campuses, though the transportation burden (taking a class time-slot out of the weekly academic schedule for travel in each direction for each class meeting) discourages many students from taking offerings not available on their home campuses (particularly for language classes that meet three, four or five times each week). The campuses generally encourage students to take, and in some cases offer, separate programs (short-term, semester-long and year-long) for study away, study abroad and internships in languages other than English.

The Five College Consortium also has a wide range of language collaborations, which, among other features, more than triple the number of languages offered to the students of the five campuses. Collaborative activities include:

- Teaching fifty-four less commonly taught languages and major dialects at over 250-levels offered on the five different campuses as needed;
- Offering three collaborative language curricular programs with carefully integrated pedagogies and syllabi (in Arabic, Korean and Russian) serving some or all of the five campuses;
- Employing eleven shared full-time faculty members in languages (in Arabic (5), Japanese (1), Korean (2), and Russian (3));
- Collaborating on faculty development and course development projects and seminars, currently in Chinese, Italian, and Russian; and
- Supporting a Five College Language Pedagogy Faculty Seminar that typically draws thirty to forty faculty members from the five campuses to its regular meetings.

However, the Five College Consortium is one of many examples of collaborations in language offerings and language pedagogy. In this chapter the Five College Consortium will be used as a case study for reviewing some options, but other examples of language programs offered through consortia in higher education will be cited, knowing that the list of examples is incomplete.

Why collaborate?

It is always useful to remember the different motivations for collaboration, particularly in language offerings, since the motivations often guide the solutions. In the case of teaching (and providing opportunities for students to study) languages other than English, the primary motivations for encouraging language study are: preparing students to live and work in a 21st Century world broadly multi-cultural and multi-lingual, broadening students' understandings of the role of language in inter-personal communication, and deepening students' understandings of the world's cultural riches in a range of languages through appreciating the differences and nuances of languages and their grammars, structures, vocabularies and modes of discourse.

Why do colleges and universities collaborate to achieve these goals?

- Because enrollments in the courses offered on one campus to students of the same campus are too low (too low to justify the

expense of offering courses, too low to provide learning communities of reasonable size for student learning), whereas collaborating may yield larger enrollments in each course;

- Because the number of courses needed at one campus to meet student enrollment pressures does not justify hiring a full-time language instructor (or even a full-time faculty member with a mix of language and culture instructional responsibilities), whereas collaborating on hiring may allow a full-time and longer term appointment that attracts a more skilled instructor;
- Because a campus may view language enrollments as too variable to make a long-term or full-time commitment to a language instructor, whereas collaborating on hiring may allow offering a full-time and longer-term appointment that attracts a more skilled instructor;
- By offering different language courses the campuses may encourage students to enroll at the offerings at the other campuses; and
- When there are multi-campus opportunities at some levels of language offerings but not others, campuses may choose to collaborate to ensure that students may move more seamlessly from completing a course at one level at one campus to then taking a course at the subsequent level at another campus.

Strategies for Collaboration

Collaboration in teaching and learning languages has some special challenges, particularly because language courses are sequential, and optimal language collaborations would offer students a well-articulated series of courses. But while these aspects are not present in the entire liberal arts curriculum, they do exist in other fields, notably mathematics, physics and chemistry. Hence it is worth pausing to discuss general aspects of curricular collaborations before turning to language-specific collaborations.

a. Recognize courses created at other campuses as deserving of credit. While most campuses have protocols for accepting courses taught elsewhere for transfer credit, collaborations work best when the faculty at each campus accepts fully the curricular value of courses taught at the partner campuses. It may take trials in particular departments and programs, or for particular courses, as confidence building pilots, but when campuses can move to advance approval of course credit transfers, there are more possibilities for developing program and curricular collaborations.

b. **Align course curricula**, particularly for vertically structured curricula. For curricula in higher education that involve closely articulated series of courses, going beyond "pre-requisites", such as in the first three years of instruction in a language, but also in courses ranging from mathematics and physics to engineering and chemistry, among others, collaboration is enhanced if the faculty members and their departments agree on the expectations for student learning in each course at each level. (Sometimes this is articulated in terms of "coverage" of material or chapters in a text, but clearly it is student learning goals that are most important.) Collaboration may be deepened when there has been consultation and agreement on pedagogical approaches, syllabi, texts, and details of expectations matched to assessment measures.

c. **Support student travel** to where the courses are offered, if they are not offered on the students' home campuses. This might be walking from one campus to another (as at the Colleges of the Fenway and the Claremont Colleges), special inter-campus shuttle transportation, or subsidies to enhance regional public transportation (as at the Five College Consortium), making buses on the routes among the campuses more frequent and encouraging direct, and often non-stop, routes as well.

d. **Support Cross Registration and Credit Transfer.** There are critical aspects to effectuating the registration to take a course at another campus.

- A critical aspect of encouraged and supported collaborations is that cross-campus registration is encouraged and credit for courses taken elsewhere transfers to the students' home campuses.
- To participate fully in a course, students must be registered at the campus offering the course so they are entered into the course management system, particularly for entry on the class roster, access for the syllabus and assignments, full access to the course materials and resources, and appearance on the grade list.
- Sometimes the registration is handled by the students' home campuses, with students requesting through their own Registrars permission to take courses at other campuses and the Registrars of each pair of campuses working out the details expeditiously.
- In some cases the courses are cross-listed for registration and catalog purposes as being offered at each campus, though each offering is taught at a particular campus.
- For course credit transfer, strategies range from course-by-course

approvals (as is often done for summer school courses) to automatic transfer of courses from the partner schools to the students' home campuses.

e. **Minimize Fees.**
- No extra charge to the students or the campuses. This works for many collaborations when the cross-registrations take advantage of spaces available in courses offered at each campus. This provides the maximum opportunity for collaborations without the impediment of cost.
- Charge each campus for the net number of registrations gained elsewhere (at a certain fee/course). This is often viewed as a fair way for each campus to be paid proportionately for the services it provides to other campuses. If students continue to pay tuition to their home campuses, the argument is that when they take courses at other campuses, their campuses should pay for those courses.
- Students pay extra to take courses at other campuses. This sets a higher barrier to collaboration than the transportation barrier, but may be necessary in some cases. Some campuses treat options at other campuses as supplements to their on-campus programs and courses. Cross registrations during the academic year are treated like summer school courses.

f. **Support faculty travel among various campuses** so that one faculty member can offer courses at more than one campus. Although the cost per course of sharing a full-time position is usually two to three times more expensive than the compensation of an adjunct teaching one course, sharing a full-time position may be the only way to attract a faculty member in a field for which it is difficult to find an adjunct. At the same time, a full-time position and associated appointment tenure and fringe benefits may attract a higher caliber faculty member, and one who is able and willing to hold convenient office hours and provide some departmental service as well.

g. **Support hybrid courses with video-conference connected classrooms** so that a course offered at one campus which may be taken synchronously by students who remain at other campuses. An option to consider is to include support for a conversation partner (proficient speaker) in the secondary classroom(s). When there are distances between participating campuses, consider alternating the location of the faculty member, and correspondingly alternating the location of the

conversation partner. In Sunoikisis (the virtual classics department pioneered by the Associated Colleges of the South), since many of the participating campuses have small classics departments (few faculty members and few majors), many courses are offered by one campus with audio or video connections for students from the other campuses, but with support available to students from the classics faculty members on their home campuses.

h. Offer on-line courses for asynchronous learning. Increasingly excellent on-line learning opportunities can work effectively if materials are available or easily posted by faculty members. In some cases these resources are accompanied by on-line teaching assistance. Students may make great strides in developing language mastery using these materials. Campuses looking for ways to offer credit for the language mastery students develop using on-line resources may use the national ACTFL exams or choose to recruit on-line examiners to ascertain the levels of student mastery.

i. Adopt strategies for providing Less Commonly Taught Languages (LCTLs). By the literal meaning of the term, LCTL applies to a language less frequently offered by classroom instruction. The Big Ten Consortium (Committee for Institutional Cooperation) has coordinated arrangements under which students at each campus have a wider range of LCTLs from which to choose (students have access to 100 LCTLs even though no campus offers more than 53). For details see: https://www.cic.net/students/language-study/home.

This challenge is greater for smaller colleges which serve smaller numbers of students. For them LCTL is a term usually applied to Less Commonly Studied Languages" (LCSL), often meaning that enrollments are too low to justify normal arrangements for classroom-based teaching. Most colleges and universities simply decide not to hire faculty members to teach low-enrollment courses and hence do not offer languages of interest to only a few students. When institutions are collaborating on methods of offering courses from one campus to students at a group of campuses, there may be enough students interested in a language (or level of a language) to justify offering the course.

Five College Collaboration

The Five College Consortium currently has forty full-time faculty members in shared positions, and over the last fifty years we have had a total of over one hundred colleagues in such positions. In addition, the Consortium sponsors the offering of over 50 less commonly taught languages. In addressing collaborative strategies for languages, Five Colleges has several variants and hybrids of these features for enhancing collaborations.

Designate some language programs as "consortial." Several of the Five College language programs are designated as "Five College X" (where X currently is Arabic, Korean, or Russian) with carefully structured syllabi and expectations for courses at the same level and careful articulation of courses at successive levels, regardless of where they are taught, maximizing the ease at which students can navigate changing from one level at one campus to the next level at another campus. This mode of collaboration may proceed informally, but collaboration is enhanced when there are regular meetings to renew the commitment to alignment of courses in these programs. When there are substantial budgets or faculty positions involved in the shared programs, collaboration is enhanced by having a steering committee and a coordinator or director of the program.

Appoint faculty members into "joint positions." Though not essential or necessarily linked to the category above of "Five College language programs," there are arrangements under which some or all of our campuses have agreed to share the cost of the total compensation (and teaching) of a faculty member who is then called a Five College faculty member (e.g., Five college Lecturer in Arabic or Five College Assistant Professor of History). Specifically for the consortial language programs, those agreements are applied in one or more of the following ways.

1. Costs are shared based on the fraction of the teaching that a joint faculty member does at the various campuses.
2. Total compensation costs for a group of joint faculty members teaching in the same consortial language program are shared among the participating campuses based on a formula adjusted to account for both enrollments from the campuses and the campuses on which the various courses are offered (usually those which have the highest enrollment pressure).
3. If the student registration from other campuses induces a need to hire additional faculty member to offer an additional section of the course at the campus receiving the enrollments (that is, exceeding

the "space available" in the sections that the receiving campus would offer anyway), then the "sending campuses" are expected to contribute to the staffing costs of the extra section(s). Often this last variant induces campuses to reverse their staffing plans and course offerings; those previously unwilling to offer certain languages at certain levels, decide to offer those sections with shared faculty members (optimizing the enrollment possibilities without travel difficulties).

4. The participating chief academic officers appoint a director or coordinator of each shared language program to convene regular meetings of the faculty members, guide curriculum and pedagogy discussions, and recommend course offerings and the schedules of classes and corresponding teaching assignments.

Among other effective practices adopted in the Five College Consortium to support shared faculty members more generally are the following.

• The Five Colleges (FC) have formalized a clear understanding, among the campuses (enshrined in policies endorsed by the chief academic officers) that each joint faculty member is employed by a particular campus with compensation, benefits, appointment and review processes, number of courses to teach, service expectations, annual reporting and overall expectations for reappointment set primarily by the employing campus based on its practices for full-time faculty members of equivalent rank at that campus. One modification is the procedure for contributions from the other campuses (at both the departmental level and at the level of chief academic officers) to the annual performance reviews to include input on tenure and promotion processes. However, by basing the reviews on the practices of the employing campus, Five Colleges avoids the dangers and complications of double or triple jeopardy arising from independent reviews on the separate campuses.

• Most commonly, each full-time joint faculty teaches at least half of her courses at the employing campus.

• Each full-time joint faculty member has voting privileges in faculty meetings at the employing campus and is assigned for mentoring and administrative support to an academic unit (department or program) that has other faculty members at the employing campus.

• Each full-time joint faculty member is given an office at the employing campus equivalent to what would be provided to a full-time faculty member at that campus and one which is close to the offices of other faculty members in the assigned academic unit.

• Each full-time joint faculty member is assigned to an academic

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program or department at each of the other campuses participating in the sharing agreements and receiving courses from the shared faculty member.

• Each full-time joint faculty member is assigned office space which may be shared, as is typical for part-time faculty members at the participating campuses to use in those semesters when teaching courses.

• FC creates a support committee for each joint full-time faculty member made up of the department chair or an assigned senior colleague from each department sharing the faculty member's courses and a member of the academic programs staff of the consortium.

• FC provides a consortium staff member to explore and share with all of the joint faculty members the links to academic regulations and services (from course management systems and academic integrity policies to grading and course evaluation practices). The staff member also helps shared faculty member obtain parking passes, when needed, and arranges reimbursement of excess travel caused by having to teach at more than one campus.

• Since each position has its own costs and commitments, ranging from short term to tenure-track, FC completes reviews by the chief academic officers of financial commitments to a term position or to refilling a vacant tenure-track position (pursuant to extending those commitments) before launching the performance review of person holding that position or a search to fill the position.

Collaborate on strategies for offering Less Commonly Taught Languages (LCTLs). Formed initially in the early 1990's as a shared Center for Teaching Languages with Technology, the Five College Center for the Study of World Languages (FCCSWL) now coordinates the offering of fifty four less commonly studied languages at over two hundred and fifty different levels. For details visit the FCCSWL website at https://www.fivecolleges.edu/fclang.

Learning opportunities come in two forms, both tailored for individual instruction offered at each of the campuses by traveling facilitators.

Mentored Instruction uses specified texts, on-line materials, defined lesson plans. Trained mentors (including both full-time employees and part-time post-baccalaureate teaching assistants, some of whom are Fulbright Foreign Language Teaching Assistants and others of whom are graduate students at the University) guide students through

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structured learning. The work is overseen by a language pedagogue with faculty status, who also offers a course on American Language Pedagogy for beginning mentors. Mentored learning offerings may be two-skill or four-skill, and may be taken for one-course or half-course credit. These programs are offered in half-semester units for flexible scheduling.

Supervised Independent Learning Program (SILP). For courses offered in this format, Five Colleges relies on texts and on-line materials, but the facilitator is a trained native language speaker who serves as a conversation partner. Native speakers recruited to facilitate these offerings include international students and local community members. The Center has also received over $4 million in grants to develop instructional resources for these two modes of LCTL learning. Among the recently developed resources posted on the FCCSWL website are "video grammars" which use recordings of authentic language to illustrate grammar as well as vocabulary for students to study. Though the instruction is completely staffed by employees of the Five College Consortium, all of the course offerings are approved for course credit through the University; the link is that both modes of instruction are overseen by a University faculty member.

Summary

Collaboration among colleges and universities opens opportunities for expanded curricular opportunities for students, particularly for a greater diversity of languages and levels for each language. So many different strategies have been developed and implemented for different geographical, pedagogical and enrollment circumstances that any campus considering such collaborations has many models and a multitude of experiences upon which to draw.

In Memoriam

I am honored to have this opportunity to honor the memory of Elizabeth Mazzocco, pioneering and visionary innovator in language teaching and learning, particularly for less commonly studied languages, who died in Fall 2014. Elizabeth was Professor of Italian at the University of Massachusetts Amherst and the founding Director of the Five College Language Resource Center (FCLRC) in 1991, soon thereafter, with a change of purpose from being a facility for teaching languages with advanced technologies, more aptly renamed the Five College Center for the Study of World Languages. She designed and supervised the

growth of two major initiatives, both supervised independent learning with on-line curricula for student use with native-speaking conversation partners and faculty-supervised instruction by trained teaching mentors. After investing over twenty years of her energy and imagination to these efforts, she left the Five College Center with capacity to support over fifty languages in one or both of these formats at over two hundred and fifty equivalent levels of semester-long curricula. Details of her life and work on language pedagogy may be found at https://www.fivecolleges.edu/fclang/about/people/mazzocco. If she were alive today, she would be a co-author on this contributed chapter.

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and resources. Another major observation is that these kinds of projects not only broaden CRC's reach into the community but they provide ways to get personnel from a wide variety of campus areas together, groups which have not traditionally met within CRC. While keeping CRC's traditional programs active, the consortium has expanded to meet and share ideas among non-traditional groups such as the security officers, IT leaders and residence hall directors. It is surprising to report, that as varied as CRC campuses are in size and type, they interact very well with one another. The large schools do not dominate and the smaller schools do not feel intimidated. Faculty and staff from a team of specialists at North Carolina State add value and commonalities with small college leaders who are juggling three different administrative hats. The CRC is searching to find ways in which they can expand the emphasis on community connections and find ways to communicate about opportunities for the future. This is encouraging to CRC, realizing they will need to do more with public relations to spread the word. CRC will participate in more community-wide events and make contact with all forms of media from internal and external groups. CRC must monitor not only issues in higher education but issues and concerns in our community.

Moving Forward

The CRC is adopting a two-pronged approach to our consortium, both inside and outside agendas. CRC has been creative in our way of thinking about how to get people across our colleges and universities to connect and collaborate. To cultivate appropriate community partners is equally important to make our community appreciate and benefit from our institutions. The CRC is a support system to the government leaders, public schools, business leaders and community non-profits by tapping into its resources and expertise and vice versa. CRC can better serve its students, faculty and staff because they are more integrated into the broader community. It is always about collaboration, finding the scope of services within the consortium, and being prepared to meet the changes of the surrounding environment.

*For details about the economic impact studies go to http:// crcraleighcolleges.org/serving/economic_impact/

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Three examples highlight the relative roles of faculty, institutional leaders and consortium staff in advancing faculty development through collaborative research. Discussion includes the value of drawing from the learning sciences and theories of change. Professional learning communities are a powerful capacity building vehicle in which to strengthen shared learning and support among multiple stakeholders.

Strengthening Capacity Through Collaborative Research

Elizabeth A. Moy, David A. Dunbar

Collaborating to Improve Teaching and Learning

The Southeastern Pennsylvania Consortium for Higher Education (SEPCHE) is a collaborative of eight independent colleges and universities in the Philadelphia region: Arcadia University (Glenside), Cabrini College (Radnor), Chestnut Hill College (Northwest Philadelphia), Gwynedd Mercy University (Gwynedd Valley), Holy Family University (Northeast Philadelphia), Immaculata University (Malvern), Neumann University (Aston), and Rosemont College (Rosemont). Founded in 1993, these small to mid-sized institutions educate over 20,000 students and share a commitment to educate lifelong learners who will make meaningful contributions to society and who act from a foundation of values.

The mission of SEPCHE is to enhance the quality and efficiency of academic programming, student access, institutional operations and community outreach at the members' colleges through interinstitutional cooperation and technological linkages. Collaborative activities span academic and administrative functions and range from faculty and staff professional development, a host of student conferences and symposia, cross registration and interlibrary loan, shared library e-collections and group purchasing to year-round collaborative career development activities.

Recent faculty led initiatives highlight the value of faculty learning communities in advancing both professional development and innovative collaborations. Senior leadership, faculty, external partners and consortium staff play interdependent roles that enable both.

Recognizing the changing pace of knowledge creation, new knowledge in the learning sciences, and the realities of teaching and faculty work, SEPCHE faculty recently led a multi-year faculty development effort that expanded evidence-based teaching. The initiative Building Faculty Capacity for 21st Century Teaching made possible through the generosity of The Teagle Foundation, strengthened faculty knowledge of neuroscience principles, translated these to teaching, and provided new assessment techniques through participation in a learning community (Moy, et al, 2014). Dr. Christian Jernstedt, a neuroscientist with over forty-five years of research experience, director emeritus of the Center for Teaching and Student Learning Outcomes and professor emeritus with Dartmouth College, provided regular infusions of professional development in the learning sciences and coaching support as faculty applied learning concepts to their teaching practice.

At the start of the project, chief academic officers identified two faculty "conveners" from each institution to coordinate faculty efforts within their institutions. Faculty conveners communicated project progress to faculty within faculty channels and often led faculty workshops involving full and part-time faculty. Chief academic officers hosted a consortium-wide workshop at the beginning of each semester that acquainted faculty with the science of learning, generated research ideas applying these ideas to teaching, and invited faculty proposals to an innovation fund to support semester-long research of teaching.

Consortium staff coordinated the proposal and review process, distributed award letters, scheduled faculty sessions with Dr. Jernstedt, and managed institution reimbursements and faculty reporting. In addition, consortium staff facilitated annual check-in meetings with senior leadership and Dr. Jernstedt to review project progress and plan process improvements. Faculty conveners and consortium staff provided proposal and Institutional Review Board (IRB) application assistance.

At the end of each year, a cross-institutional faculty development conference involving faculty, deans and chief academic officers enabled learning community members to share their research work. Presidents at host campuses provided welcoming remarks at the end-of-year conference and requested period updates within their institutions.

The model successfully engaged two-thirds of full time faculty in fifty faculty research projects and eighteen faculty-led learning

communities. For many faculty members, the effort reinvigorated their passion for teaching. Many noted that the support found in the learning community enabled them to make critical changes they will sustain.

Development of the SEPCHE STEM Working Group

The SEPCHE Science, Technology, Engineering and Math (STEM) Working Group formed as an outgrowth of the Building Faculty Capacity Initiative when several professors suggested meeting to learn each other's research interests and explore the potential for funded research collaborations. With the help of chief academic officers, consortium staff invited science, math and computer science faculty to quarterly meetings led by respected biology professor Ken Soprano, who was appointed by chief academic officers to chair the STEM Faculty Workgroup. Collegial workgroup conversations provided a space for mutual support and exchange of ideas. Two innovative collaborations emerged over several semesters expanding undergraduate research through a Summer course-based Undergraduate Research Experience (SURE) and developing a cross-institutional, community-based course-based undergraduate research project.

Collaborative Course-based Undergraduate Research (SEPCHE S-CURE)

Drawing from both Summer Undergraduate Research Experiences (SUREs) and Course-based Undergraduate Research Experience models (CUREs), the SEPCHE STEM Working Group developed a hybrid model (called S-CURE). Rather than teaching the CURE over ten weeks during the academic year, the CURE was taught during the summer for several reasons.

The S-CURE model combines the intensity of the traditional summer apprenticeship (SURE) with the collaborative parallel learning and engagement in discovery research found in CUREs. The S-CURE model enables student mentoring from both faculty and undergraduate peer mentors. Earlier research at Cabrini College demonstrates the value of utilizing undergraduate peer mentors for the SEA-PHAGES course (Dunbar et al., 2012; Harrison et al., 2010), as they facilitate student contribution to a common research goal (Shaffer et al., 2014).

The S-CURE responds to several challenges: unmet demand for undergraduate research experiences, increasing expectations for research scholarship in tenure and promotion, heavy teaching loads, and

limited equipment and lab space across institutions that may be geographically close. It also provides an opportunity to learn how the quality of student learning and engagement in the S-CURE model differs from that in SUREs or CUREs.

The Howard Hughes Medical Institute's Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Sciences (HHMI SEA-PHAGES) CURE is a nationally recognized, widely assessed CURE. The research agenda involving over seventy-five colleges and universities is to identify phages (viruses that infect bacteria) as a means to understand phage functions in their interactions with bacteria. Phage therapies are helping to address antibiotic resistant bacterial infections in developing countries and are involved extensively in environmental remediation. The CURE involves ecology, math, biology and bioinformatics and is a model program advancing both science and science education.

SEPCHE STEM Faculty Workgroup members proposed to chief academic officers in fall 2013 a S-CURE affiliated with the HHMI SEA-PHAGES CURE. Cabrini College science professor David Dunbar, a member of the HHMI SEA-PHAGES community, welcomed the opportunity to expand enrollment to include SEPCHE students. Workgroup colleagues appreciated both the discovery aspects of the CURE as well as its pedagogical approach enabling students to move from concrete, observable elements (soil collection and enrichment plating) to very abstract conceptual thinking (DNA restriction digests and bioinformatics). Chief academic officers, who supported the proposed S-CURE, spoke individually with their presidents who then discussed the S-CURE as a first pilot in which to test coordination aspects of a shared course.

A First Test of Shared Coursework

Presidents appointed six months prior a subcommittee comprised of presidents and chief academic officers to research other consortia operating shared coursework and to develop recommendations and proposed guidelines. Presidents agreed to pilot shared coursework for three years without exchange of fees for shared coursework running during the academic year and cost coverage for summer research experiences.

Because the proposed S-CURE occurred outside the academic year, Presidents agreed to fund course costs and to provide summer tuition grants so that students could take the course for free and receive credits.

Additionally, Cabrini President Donald Taylor made available to students free housing for students who might not otherwise take the course due to transportation barriers. This generous contribution enabled a third of students to enroll in the course.

Following chief academic officers and president approval to offer the S-CURE as a shared course, science faculty and department chairs at sending institutions nominated students needing a research experience or students who could substantially benefit from the experience. Students submitted an application and registration form. Students were notified of their acceptance into the course and the registrar of the host institution followed up with each student to provide institutional policies, assistance with obtaining identification cards and entry into the learning management system.

S-CURE Pilot Results

During the pilot in summer 2014, seven students participated from four institutions: Arcadia University, Cabrini College, where the S-CURE was hosted; Immaculata University and Neumann University. Student engagement was unprecedented. While the S-CURE was scheduled for ten weeks Monday through Thursday evenings from 5 to 9 pm, most students spent seven or more hours in the lab per day; more than half came in on weekends, and most asked if they could stay beyond the length of the CURE to keep researching. Students developed during the CURE a novel phage isolation technique that enabled them to isolate twenty-five (17 novel) arthrobacteriophages. At time of discovery, only eighty-six arthrobacteriophages had ever been isolated. Students co-authored a publication in the Journal of Visualized Experiments (JoVE) (Cross, et al., 2015) and have presented posters at the Pennsylvania Research at the Capitol, University of Maryland Baltimore campus Undergraduate Research Symposium, the Pennsylvania Academy of Science Conference and the HHMI SEA-PHAGES Symposium. (Forthcoming student publications include GenBank and peer reviewed Genome Announcements.)

Students developed a fluency in wet lab techniques that enabled some to become peer mentors in other science courses. Students' excitement and competence prompted faculty to consider sending additional students if the S-CURE would be offered in future and to consider developing the CURE at their own institutions to expand undergraduate research opportunities.

Presidents and chief academic officers generously agreed to support

the S-CURE during a second summer in 2015. The course enrolled eighteen students from five institutions, more than doubling the enrollment of the first year.

One of the strengths of the CURE model is the contribution of data by undergraduate researchers to the research question. For early career scientists in geographic proximity, CUREs can provide an option to expand undergraduate research experience in a supportive learning community where an experienced faculty member may already be engaged in a CURE network. Recognizing this, faculty at two SEPCHE institutions are collaborating with Dr. Dunbar to be mentored as future instructors of the SEA-PHAGES CURE so that they can propagate the model at their own institutions.

Community Based, Course-based Undergraduate Research Experience

Another collaboration of the STEM workgroup is a CURE focused on research of macroinvertebrates as a measure of stream health. Macroinvertebrates are larval aquatic insects that form the base of the aquatic food chain and have been studied as way to measure stream health.

Discussions between the SEPCHE STEM working group, regional community partners from the Valley Creek Partnership (VCRP) and Stroud Water Research Center entomologist John Jackson, emerged from prior National Science Foundation (NSF) funded collaborations between Cabrini professor David Dunbar and VCRP chair Owen Owens connecting molecular biology techniques to ecology research. A brief history shows how formal and informal relationships can build sustainable collaborations and suggests how model collaborations can be brought to scale through consortium networks.

Many VCRP members are avid fly fisherman who regularly fish Valley Creek, an Environmental Protection Agency (EPA) protected stream running through Valley Forge National Historical Park. They have observed over time changes in resident stream macroinvertebrate populations and have wondered if there is a connection with their observations and changing weather patterns.

STEM Workgroup members immediately recognized the multi-disciplinary student learning that could be achieved in studying such a question. Collectively their expertise included ecology, soil chemistry, biology, taxonomy and entomology. Recognizing the interest of faculty in advancing a collaborative research project, the potential of working with a world class scientist on a question of significance, and

collaborating with an active community based organization; the workgroup asked how they might scale up earlier efforts with Drs. Dunbar and Jackson to develop and advance a research question of significance that would necessarily require the input of many undergraduates.

Knowing that faculty would need a molecular biology technique called DNA barcoding to advance the research, Dr. Dunbar and consortium staff worked with Cold Spring Harbor Laboratories DNA Learning Center, which generously provided a DNA Barcoding workshop for twenty-three college and high school faculty and student peer mentors in the Philadelphia region. Since then, variations of the DNA Barcoding CURE have been tested in multiple classes in Biology, Genetics and Ecology at three institutions to understand how it can be adapted as a module to engage undergraduates in this research.

Discussion

These examples illustrate how faculty learning communities and workgroups can strengthen scholarship of teaching and learning while building institutional capacity for collaborative research and providing students access to current research questions to which they can contribute new knowledge. With consistent leadership support from senior leaders, guidance from an external specialist and coordination support from consortium staff, faculty find energy and renewed commitment in shared learning and problem solving with colleagues. All of these elements can fuel the creation of innovative collaborations.

Faculty are motivated by the same drivers of complex problem solving, i.e. autonomy, mastery and purpose (Pink, 2013). The social aspects of collaborative learning strengthen engagement. When they experience firsthand the impact of collaborative efforts, that sense of being part of a larger, purposeful collaboration is just as compelling as it is for students.

A pervasive ethic of contribution, trust and the presence of "safe space" for experimentation are all important ingredients in scaling change (Kezar, 2015). Presidents and chief academic officers can provide efficient "just in time" professional development to advance efforts. At the same time, when stakeholder groups are oriented toward learning – in both the collaborative project and in the processes that support it, they build their own capacities for learning, risk taking and continuous improvement (Bauman, 2005).

This more organic "just in time" approach responds to specific

faculty development needs and suggests a potential, cost effective incentive for faculty workgroups. Equipping faculty with the skills needed to advance development of the macroinvertebrate CURE supported their desire for learning and kept the initiative advancing. In many respects, this form of professional development reflects a similar process used to expand evidence-based practice that drew from the learning sciences — smaller infusions of professional development, ample opportunities to apply learning, alongside feedback in a supportive learning community (Moy, et al, 2014).

Taking more time at the beginning of projects to engage collaboratively enables workgroup members to strengthen ownership of shared goals through sense making (Kezar, 2015; 2008). This shared knowledge allows the group to move more quickly when opportunities arise.

For example, with broad understanding and support for collaborative efforts and knowing which professors were interested in getting involved, professor David Dunbar was able to confirm quickly the involvement and support of colleague professors and their institutions to develop a collaborative National Science Foundation (NSF) proposal when the call for proposals was announced. Likewise, STEM Workgroup Chair Ken Soprano spent significant time building shared understanding about the role of the workgroup and identifying initiatives for which there exists broader support. As a result, workgroup members have led efforts at their own institutions to advance these projects.

Senior leadership support comes in many forms: feedback to improve faculty research projects, helpful internal coordination of institutional supports and communicating widely ongoing efforts, to name a few. Support also comes in allowing faculty time, resources and space to experiment with and to contextualize potential interventions, such as testing the DNA barcoding CURE in various course settings. Recognizing that "one size does not fit all" means that more time may be needed to test variations of an approach to fit an institution's environment. This additional time strengthens the likelihood of faculty "buy in" when they can be given the autonomy to adjust a proposed intervention to suit their institutional context.

Faculty members possess individually and collectively the creative ideas and relationships with other experts that can spawn innovative research collaborations. Building an environment in which to cultivate and test new ideas is the job of senior leaders and consortium staff, both of whom depend on each other to recognize and advance ideas, as well as to nurture a system-wide orientation toward experimentation and

learning.

External partners, such as lead scientists, faculty development specialists and external consultants, play a vital role in strengthening initiatives. Periodic review of initiatives with external partners enables accountability and opportunities for learning. External partners can question underlying assumptions and biases, and can bring new ideas that provide new learning and capacity building for stakeholders.

Conclusion

Multiple frameworks and theories of change provide important resources from which stakeholders can build scalable faculty professional development and innovative research collaborations that benefit all stakeholders. In highlighting the various roles of key stakeholders in the development of learning communities and collaborative research, we hope to contribute evidence for recasting faculty development as an important capacity builder for systems learning and improvement.

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This chapter shares the experiences of the Virginia Tidewater Consortium for Higher Education's relationship with the U.S. Department of Labor and the promotion of Registered Apprenticeships as a pathway to postsecondary education.

10

Registered Apprenticeships and Higher Education:
A Pathway to Postsecondary Education

Laurence G. Dotolo

VTC History

In the summer of 2012, the Virginia Tidewater Consortium for Higher Education (VTC), a consortium of fifteen colleges both public and private located in the Tidewater region of Virginia, attempted to expand its access program to attract under-served populations into higher education by offering a Registered Apprenticeship Career Expo. The first Registered Apprenticeship Career Expo was held in Norfolk, Virginia at the Workforce Development Center in partnership with the City of Norfolk's Development Office and the Virginia Department of Labor and Industry, Division of Registered Apprenticeship. The VTC registered thirty "Vendors" or companies offering Virginia Registered Apprenticeships to the general public at the Expo. The Expo was held in late July, and the expectation was that it would be considered a success if two or three hundred people attended who would be seeking more information about apprenticeships. Even though apprenticeships have been around for many years in the United States, members of the general public and many colleagues in higher education have little knowledge of or experience with apprenticeship programs. Thus, the expectations were modest as to the number of individuals who would attend because of the low name recognition. The Virginia Tidewater Consortium advertised the program directly to the clients of the EOC, who were primarily low-income potentially first-generation postsecondary students. The companies registered as "Vendors," were looking for qualified apprentices from a variety of occupations and skill sets, such as plumbers, electricians, sheet metal workers, heating and air conditioning specialist, mass transit bus drivers, ship repair workers, pipe fitters,