PRACTICE

Credit Where Credit Is Due: A Course-Load Banking System to Support Faculty-Mentored Student Research

Christopher S. Kim, Anna Leahy, Lisa Kendrick,
Chapman University

Abstract

Faculty participation in mentoring undergraduate research can be limited by the time demands involved and the relatively low compensation typically offered at most institutions. The system designed by Chapman University's Office of Undergraduate Research and Creative Activity (OURCA) facilitates independent research by undergraduate students who wish to receive academic credit and awards teaching credit to faculty members who mentor this research. This faculty-student research banking (FSRB) program counts student research credits toward faculty teaching loads, allowing 24 credits to be exchanged for a one-course reduced teaching load in a future academic term. The financial and structural parameters of the FSRB program and data from the first three years of its operation are provided, including guidelines developed and lessons learned, which may assist other institutions in applying and creating similar systems.

Keywords: *undergraduate research, credit, faculty workload, faculty service, mentoring*

doi: 10.18833/spur/1/1/8

Undergraduate student engagement in independent research and creative activity has been well established as one of the most high-impact, potentially transformative learning experiences available in postsecondary education, with corresponding potential benefits on student retention/graduation, faculty members' scholarly productivity, and graduates' persistence in research-related careers (Lopatto 2003; Kuh et al. 2007; Kuh 2008). However, the National Survey of Student Engagement (NSSE) indicates that only a minority of senior undergraduates self-report participation in faculty-mentored research, with percentages relatively stable at 24 ± 1.5 percent from 2013 to 2015 (NSSE 2017).

Insight into this apparent discrepancy at Chapman University, a four-year private master's university located in Southern California, can be gleaned from internal institutional surveys of its faculty members regarding their perspectives and practices on student research. These surveys largely conclude that time and energy limitations—and not, as some might anticipate, financial compensation—restrict broader engagement by faculty in the undergraduate research enterprise (Arredondo and Gordon 2010; Chapman University 2010, 2012, 2014). Viewed through the classic framework of academic tenure and promotion guidelines that emphasize scholarly output, teaching, and service, faculty are unlikely to assume the responsibility of mentoring undergraduate student researchers in addition to existing institutional expectations if the activity is not credited by the academy as teaching and is not perceived as efficiently advancing the scholarly agenda of the faculty member. The limited resource of time is a recurring theme in other studies (e.g., Zydney et al. 2002).

Chapman University has developed a system that directly addresses this issue by awarding teaching credit to faculty members who mentor undergraduate research. In operation since fall 2013, the faculty-student research banking (FSRB) program, developed by Chapman University's Office of Undergraduate Research and Creative Activity (OURCA), allows students to enroll in independent

research/creative activity credits that count toward faculty teaching loads, enabling the accumulation of a set number of credits (24) to be exchanged for a one-course reduced teaching load in a future academic term. This process effectively values the mentorship of undergraduate research as a form of teaching and assigns credit accordingly.

The Rationale for Credit Banking

Although the current operation of the FSRB program primarily involves logistical and organizational oversight by a dedicated staff member within OURCA, its initial approval by the university's upper administration was dependent on detailed and sound projections of the potential financial costs to the institution. Fortunately, Chapman University has a long history (more than 10 years) of allowing students to enroll in independent study credits (which included faculty-mentored independent research and creative activities), with an existing but low compensation structure for faculty who oversaw such independent work. This data provided valuable baseline enrollment and financial information upon which the FSRB program could be developed.

A spreadsheet model to produce relevant financial calculations and projections for the FSRB program is available in Excel format to interested parties upon request to OURCA and can be easily modified to meet individual institutional needs. A basic overview of the approach is provided here. The following data is required to make all relevant calculations (see Table 1 for an example of such calculations using fictionalized sample values):

- Historical (e.g., most recent academic year) tally of independent research/study credits undertaken by students
- Annual full-time undergraduate tuition rate
- Average full-time undergraduate tuition discount rate, representing all financial aid, scholarships, and fellowships
- Average academic credits/year taken by full-time undergraduates
- Prior faculty compensation for mentoring student research (if applicable)
- Adjunct/part-time faculty compensation rate
- Proposed FSRB conversion rate of research credits to teaching credits

With this information in hand, the model can be used to calculate the following:

- Net costs/revenues generated under the prior compensation system
- Predicted net costs/revenues associated with varying conversion rates (e.g., 25 percent, 50 percent, 100 percent) from the prior compensation system to the FSRB program

Model calculations by necessity make a number of assumptions, including (1) faculty course load reductions will be covered entirely by adjunct faculty, (2) benefits are not a part of the calculation for adjunct compensation costs, and (3) students participating in research in general meet the average student discount rate.

TABLE 1. An Example of Financial Calculations and Cost Projections for the Faculty-Student Research Banking Program (FSRB)

Institutional data	
Student research credits/year (from historical data)	1200
Annual tuition	$40,000
Discount rate	40%
Average credits/student/year	32
Prior faculty compensation/credit for mentoring student research	$100
Adjunct faculty compensation/teaching credit	$1,500

Revenues generated under the prior system	
Annual total revenues generated	$900,000
Annual faculty compensation cost	$120,000
Annual net revenues generated	*$780,000*

Revenues generated under the FSRB program	
Ratio of research credits to teaching credits	8:1
Total teaching credits accrued/year	150
Total number of 3-credit classes accrued/year	50
Maximum annual adjunct compensation cost	$225,000
Minimum annual net revenues generated	$675,000

Revenue projections for the FSRB program	
Net revenue under current system	$780,000
Net revenue given 25 percent transfer to FSRB	$753,750
Net revenue given 50 percent transfer to FSRB	$727,500
Net revenue given 100 percent transfer to FSRB	$675,000

Cost projections for the FSRB program	
Cost @ 25 percent credit transfer to FSRB	$26,250
Cost @ 50 percent credit transfer to FSRB	$52,500
Cost @ 100 percent credit transfer to FSRB	$105,000

Note: Figures for illustration purposes only (not actual)

Model projections conducted for Chapman University indicate that the additional cost to the university to initiate the FSRB program, based on historical data, would not exceed approximately $140,000 per year, assuming a highly conservative 100-percent conversion rate of historical independent study/research credits to the FSRB program. This calculation was sufficient grounds for the university's chancellor and chief operating officer to approve the launch of the program on a trial basis starting fall 2013, with a planned review after its first 1–2 years of operation to determine whether any adjustments were needed.

The Faculty-Student Research Banking Program (FSRB)

Definitions

For the purposes of academic credit, Chapman University's undergraduate catalog definition of student-faculty research and creative activity resembles that of the Council on Undergraduate Research: "independent, faculty-mentored scholarly research/creative activity in their discipline which develops fundamentally novel knowledge, content, and/or data" (Chapman University 2015). This description emphasizes the following requirements:

1. The student will work both independently and under the mentorship of a faculty member.
2. The final outcome of the work is to be novel—original or innovative—within the discipline in which the research or creative activity is conducted.

The emphasis on these two aspects distinguishes this credit option from regular coursework for major and general education requirements as well as from other types of independent study such as reading courses.

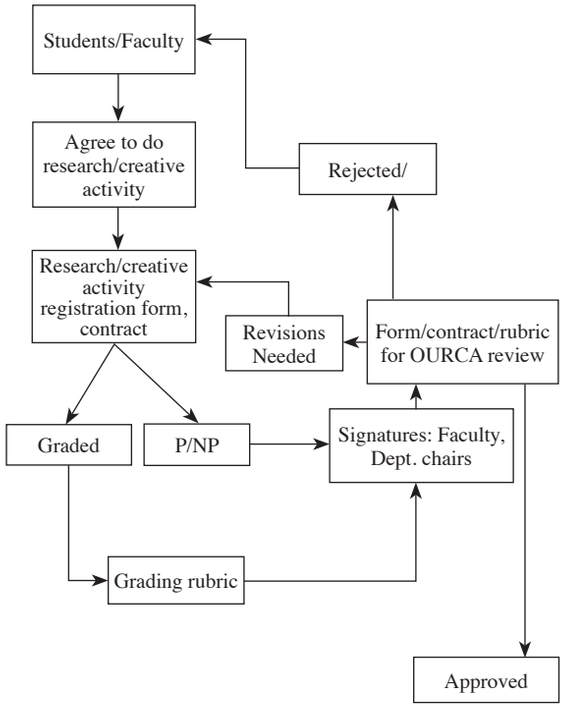
In practice, participation in independent research and creative activity for academic credit can be initiated by either the student or the faculty mentor. For example, a research-based, scholarly, or creative project could be one originated by the student based on his or her interests, expertise, and program of study; the student would then seek a faculty mentor to supervise work on this project as part of the course. Alternatively and more commonly, a project could originate with a faculty mentor as part of a larger area of study under exploration by the professor; the faculty member then would seek/recruit a student to mentor. In some fields or for some projects, research or creative activity is conducted in a team format; in such cases, each student is responsible for distinct tasks and makes an individual contribution to a larger project to fulfill the requirements for the research credits.

Structural Components

Figure 1 shows a workflow model that demonstrates the development, submittal, and approval process for student-faculty collaborative research or creative activity. Proposals are encouraged during regular course enrollment periods in the prior academic term (e.g., midway through fall semester for participation in the spring semester), and the deadline for proposals is the university add/drop deadline, which in a regular semester occurs at the end of the second week of classes; this represents a minimum 12-week window for enrollment in independent research credits. Proposals are usually reviewed by OURCA within a few days of submission. Sometimes, more information is requested from the student; the most common omission is the grading rubric required for research credits in which the student has enrolled for a letter grade (versus the "pass" or "no pass" option). The proposal serves as an agreement among the student, faculty mentor, and the university, and OURCA review works to ensure compliance with the program's guidelines and a match between the proposal and the student's work tracked through the semester. The registrar's office is notified of approved proposals and establishes each course section.

Students may enroll in 1–3 independent research or creative activity credits per academic term in nearly all academic disciplines under the 291 (lower class), 491 (upper class), and 682 (graduate) course number designations, allowing for intermediate and advanced work at the undergraduate level as well as graduate-level work. Enrollment can be repeated for credit so it can be used

FIGURE 1. Flowchart Showing the Approval and Enrollment Process in Independent Student-Faculty Research/Creative Activity Credits Under the Faculty-Student Research Banking Program (FSRB)



for an independent project that spans multiple semesters. These designations were added to the university catalogs across departments at the same time, so that the credit option is available to students regardless of major or area of interest. For example, a BFA student in creative writing could enroll in ENG 491 to draft a novel—a creative project that is not supported directly by the curriculum—whereas a BS student in chemistry could enroll in CHEM 491 to conduct innovative experimental research as part of a larger research team.

The main exception to the across-the-board inclusion of the 291/491/682 designations in all academic units is Chapman University's business school, which chose to include this option with the BUS designation and not in its various major designations for accounting, finance, marketing, and so forth. This exception suggests that some academic programs have different uses in the curriculum for this course option and banking system than others. In addition, some department chairs expressed concerns about course coverage and class scheduling as faculty began to redeem credits for reduced course loads, which in some cases prompted chairs to develop additional departmental guidelines/restrictions on the ways in which their faculty participate in the FSRB program. Although the opportunity to register for independent research/creative activity credits ideally should be available widely across and within disciplines, it remains a challenge to ensure consistent participation in the FSRB program by all academic units. OURCA maintains ongoing conversations with chairs to address their concerns, assure them of their discretion to approve credit enrollments and teaching reductions, and expand the reach of the FSRB program where feasible. The reasons behind varied levels of participation from unit to unit are often multiple and institutionally based, and a given institution will likely need to adapt and implement its version of the FSRB program accordingly.

In practice, the 491 courses are used for research far more frequently than the 291 courses, with the former representing 90 percent of all student participants since the program's inception. Some faculty have suggested that upper-class undergraduates have the most expertise to conduct independent research or creative activity and produce novel knowledge. The significantly lower registration numbers at the 291 level may reflect the institutional culture and an opportunity in the future to build ongoing or deeper research experiences for undergraduates across their college years.

Notably, restrictions were created to ensure that independent research/creative activity credits would complement rather than compete with the existing curriculum and to avoid exploitation of the FSRB program to achieve internal departmental goals. This option, therefore, may not replace existing capstone courses or fill required curricular gaps in a major or degree program. Students cannot earn independent research/creative activity credit for classroom-based assignments. In other words, students and faculty cannot "double-dip" by using the same work for a classroom-based course as well as independent research. Another logical restriction is that a student cannot be paid as a research assistant for the same work—the same hours—that is counted toward research credits. Students paid as lab assistants for data collection, for instance, cannot enroll in academic credit for that same research task.

So as not to put undue burden on the banking system and to maintain a reasonable faculty workload, no major can require participation of all students in independent research/creative activity. The experience is designed to complement rather than substitute for degree requirements, and administrators expressed reasonable demands that faculty not bank credits that are required of students to complete a particular major. Independent research/creative activity credits have been allowed, however, as one among several options that include a summer research fellowship or a research internship for majors that already had in place a restricted research requirement for the capstone. It is likely that each academic institution will need to adjust FSRB policies according to its curricula and resources.

All regular university academic calendar deadlines—add/drop, change in number of credits, change in grading option, withdrawal, and so forth—apply to independent research/creative activity credits. Because of the extra registration paperwork required by OURCA and the registrar, students are encouraged to complete their registration forms during the regular registration period in the prior academic term; however, as previously mentioned, students may technically register for independent research/creative activity credits (as they can with any other course) up until the second week of classes.

The default and recommended grading option for independent research/creative activity credits is pass/no pass. However, the student, with approval of the faculty mentor, can also opt for a letter grade; in this case, a grading rubric must be submitted and approved by OURCA as part of the registration paperwork.

Student Requirements

Consistent with university-wide policies for all coursework, a student enrolled in independent research/creative activity credits must accomplish the following:

1. Meet with the faculty mentor for a minimum of five contact hours cumulatively over the course of the academic term.
2. Complete an average of three hours of research/creative activity per week per credit for the duration of the academic term.

Three credits of independent research/creative activity, then, requires an average of 9 hours commitment per week or 126 hours over the standard 15-week semester (excepting the one-week Thanksgiving break in the fall and spring break in the spring semester). To document this work, a student completes a weekly progress report within the Blackboard course management system that records the tasks and hours committed for each day of the prior week. The faculty mentor checks these reports on a regular basis, then transfers approved hour totals for each week to the course Grade Center in Blackboard. Although some faculty have bristled at this requirement for documentation, the university benefits from accurate, timely tracking to ensure compliance with credit requirements. Credit management is greatly aided by the fact that all course registrations (including independent research/creative activity credits) approved by the registrar automatically initiate the creation of a distinct Blackboard course website into which OURCA can transfer the weekly progress report and Grade Center settings. Failure to complete the required hours results in the recommendation of a NP or F grade, although circumstances allow for faculty discretion, including the possibility of assigning an "incomplete" grade as governed by the catalog policy on grading.

In addition to documented progress through the weekly progress reports, a student is required to upload an "end-of-semester deliverable," a culminating documentation of research/creative activity conducted during that academic term. OURCA requires that the deliverable be uploaded and all hours be transferred to the Grade Center in Blackboard by the end of the last week of classes to allow OURCA to verify the completion of credit requirements during final exam week. Often, if the student presents the research or creative activity as a poster at the university's Student Research Day (also coordinated by OURCA), the poster is submitted by the student as the end-of-semester deliverable. The faculty mentor, however, determines the form taken by the deliverable, as appropriate to the discipline in which the work is done. For example, a creative writing student might upload a draft of the novel she wrote, whereas a dance student might upload a video of a performance he choreographed.

Because OURCA initiated and developed the FSRB program, it oversees the logistics and tracking for all registered credits. Although the program continues to serve mainly undergraduates, OURCA also tracks the graduate-level credits instead of splitting the process and documentation with the Office of Graduate Education. All OURCA efforts in this program are closely coordinated with the registrar's office (for student credit) and the provost's office (for faculty-banked credit) with the assistance of the Office of Academic Technology. The communication and cooperation among these campus units is important for establishing and maintaining a successful, smoothly run program.

Faculty Requirements

To participate in the FSRB program, a faculty mentor must be on full-time status and not taking a sabbatical or another form of academic/medical leave. Although it is not a stated requirement, the program assumes that faculty will have expertise in the general area of research or creative activity in which they mentor.

When mentoring a student for independent research/creative activity credits, a faculty mentor must complete the following tasks:

- Review the student's hours as reported in the weekly progress reports and transfer the approved number of hours to the Blackboard Grade Center on a regular (ideally weekly) basis.
- Hold a minimum of five individual (not group) contact hours with the student.
- Review the end-of-semester deliverable prior to submission.
- Submit the final grade as part of the regular grade submission process.

Failure to complete these tasks will result in the faculty member forfeiting, instead of banking, the research credits.

Faculty Usage of Banked Credits

Once a faculty member has accrued the minimum number of banked credits (24), he or she is eligible to request a course load reduction in an upcoming semester. The process was designed with considerable lead time (i.e., the request must be placed in the fall semester for the *following* academic year) to accommodate both the faculty member and the department chair in arranging a replacement instructor for the course. The basic steps and associated deadlines for requesting and verifying course load reduction are as follows:

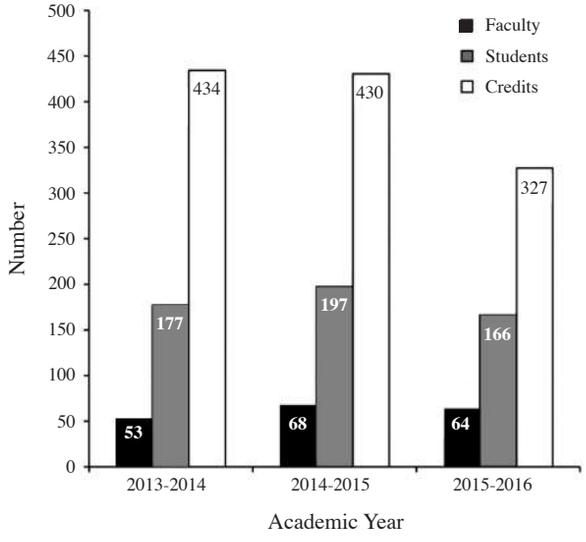
- Nov. 1: The faculty member completes and submits the FSRB Course Load Reduction Request Form via email to OURCA and the department chair to request course load reduction for a specific term in the forthcoming academic year.
- Nov. 15: OURCA verifies that the faculty member has accrued sufficient credits and forwards the request form with verification to the department chair (copying the faculty member and the vice provost of academic administration).
- Dec. 15: The department chair approves the course load reduction request, forwards it to the vice provost (copying the faculty member and OURCA), and makes an appropriate adjustment in scheduling for the forthcoming academic year, *or*
  The department chair declines the course load request, indicates an alternate semester when the course load reduction will be accommodated (ideally within the subsequent academic year), and forwards the request to the vice provost (copying the faculty member and OURCA).

- Jan. 15: The vice provost approves plans for the course load reduction and sends the form back to the faculty member for final signature indicating confirmation of plans (copying the department chair and OURCA).
- Jan. 30: The faculty member forwards the completed form with all required signatures to OURCA for final recordkeeping.
- Academic term: OURCA subtracts the appropriate number of credits from the faculty member's account at the start of the term in which the course load reduction is provided and updates the current balance for the faculty member.

Participation Rates and Analysis: 2013–2016

Participation rates in the FSRB program were relatively strong upon its launch in academic year (AY) 2013–2014 (see Figure 2), with a substantial increase in participation during the spring semester (not shown) as awareness increased among faculty and students. On a credit comparison basis, the degree of participation in the program's first year (434 credits) translated to a 30 percent conversion rate from the historical compensation program (approximately 1400 credits in the prior AY), corresponding to $42,000 in associated costs based on model projections. However, these costs were not actually realized during that academic year, as most faculty had not yet accrued the threshold number of 24 credits to allow such a request after only one year; accordingly, no course load reductions were actually requested. This level of participation persisted in AY 2014–2015, with nearly identical rates of credits accrued over the course of the year and moderate increases in the numbers of individual faculty and students participating (see Figure 2).

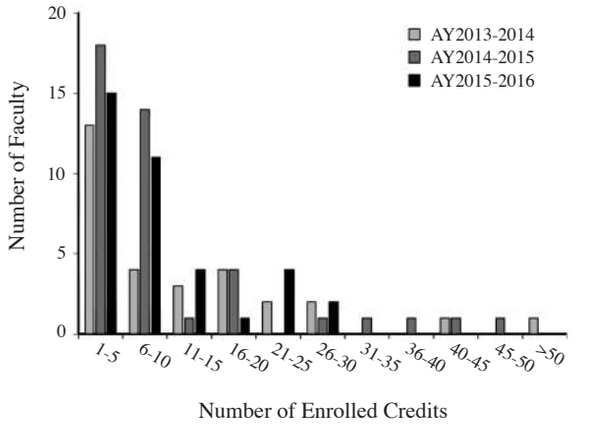
FIGURE 2. Numbers of Faculty Participants, Student Participants, and Credits Accrued in the Faculty-Student Research Banking Program (FSRB) Annually from 2013 to 2016



The FSRB program was initially launched without restrictions on faculty participation to observe how faculty would engage in the program and how many students/credits they would mentor in the absence of any restrictions. After the first two years of the FSRB program's operations, analysis showed that the number of banked credits per faculty member averaged 7.1 per year, with a median of 3. However, a few outlying faculty members were able to accrue high numbers of credits in great excess of this average (as high as 66 credits in one year in one case). This is apparent in a histogram of annual faculty credit accruals under the FSRB program from 2013 to 2016 (see Figure 3). To mitigate excessive levels of participation by these few individuals that would have affected the long-term financial viability of the program, limitations on accrual and usage rate were implemented effective in AY 2015–2016. Faculty can now accrue a maximum of 12 credits per semester and 6 credits per summer or interterm (an accelerated four-week academic term in January), and a faculty member can reduce his or her teaching load by a maximum of two courses per academic year. These limitations would not have affected the vast majority (more than 95 percent) of faculty participants if instituted in the prior two years and effectively served the purpose of curtailing only faculty who had been accruing credits at a much higher rate, as evidenced in the clear histogram shift for AY 2015–2016 (see Figure 3).

In AY 2015–2016, this program experienced variable declines in participation by faculty (-6 percent), students (-16 percent), and credits (-24 percent) (see Figure 2). These declines can be attributed, in part, to additional restrictions that some department chairs chose to put into place out of concerns that the departments would be unable to offer all required courses because of the distribution of expertise among existing faculty. However, much

FIGURE 3. Histogram of Annual Faculty Banked Credit Accruals Under the Faculty-Student Research Banking Program (FSRB) from 2013 to 2016 (Faculty with More than 24 Credits Are Eligible for Course Load Reduction)



of this decline can likely be attributed to the removal of the high credit accrual of a few faculty members observed in the first two years through the FSRB policy revisions, as evidenced by a greater percentage reduction in credits than in faculty or student participants. Notably, although the average banked credits per faculty member declined from 7.1 in the first two years to 5.1 in the most recent year, the median number of banked credits remained stable year-over-year at 3. Thus, the most current data may well represent the baseline degree of FSRB participation upon which OURCA can build in the future through additional programming and communication.

Institution-specific NSSE data from 2013 and 2015 (Chapman administers the NSSE in an alternate-year cycle) show that the percentages of Chapman seniors responding affirmatively to the category "Work with a faculty member on a research project" (42 percent and 36 percent, respectively) significantly exceeded the 20 percent national average for master's-level colleges and universities (larger programs) over the same time frame (NSSE). However, since this NSSE category could also be interpreted as including class-based research projects and because the NSSE gathers data from only graduating seniors and first-year students, the survey cannot necessarily be considered an accurate institution-wide measurement of participation and trends in independent student research.

Conclusions

The FSRB program is a viable system by which faculty and students can collaborate on independent research and creative activity while receiving teaching and academic credit, respectively, for doing so. Due to the relatively short time period the program has existed, the number of course load reductions has been minimal (1 course in AY 2014–2015, 3 courses in AY 2015–2016, and 1.5 courses in AY 2016–2017), although requests are expected to increase in subsequent years as more faculty accrue sufficient credits to merit course-load reduction.

Ongoing and future improvements include (1) increasing the transparency of accrued credits to both department chairs, other administrators, and the faculty members themselves each semester in order to better manage curricular offerings and schedules; (2) updating and projecting the financial costs of the FSRB program every semester to account for course-load reductions and the associated adjunct hiring costs; and (3) using demographic data from the first three years of participation in FSRB to identify academic programs that have a lower participation rate relative to others and determine strategies to increase their representation/activity in those programs. The success of the FSRB program in academically institutionalizing and properly rewarding the activity of faculty-student research collaborations is one that may serve as a useful model for other institutions to follow.

References

Arredondo, Marisol, and Ann Gordon. 2010. "Attitudes of Chapman Full-Time Faculty toward Undergraduate Research." Internal report, Institutional Research Office (CIRO). Orange, CA: Chapman University.

Chapman University. 2010, 2012, 2014. "Faculty Assessment of Undergraduate Research at Chapman University." Faculty Survey, Institutional Research Office (CIRO). Orange, CA: Author.

Chapman University. 2015. *2015–2016 Undergraduate Catalog*. Orange, CA: Author. Accessed May 1, 2016. http://www.chapman.edu/catalog/oc/current/ug/

Kuh, George D. 2008. *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter*. Washington, DC: American Association for Colleges and Universities.

Kuh, George D., Jillian Kinzie, Jennifer A. Buckley, Brian K. Bridges, and John C. Hyek. 2007. "Piecing Together the Student Success Puzzle: Research, Propositions, and Recommendations." *ASHE Higher Education Report* 32(5): 1–182.

Lopatto, David. 2003. "The Essential Features of Undergraduate Research." *CUR Quarterly* 24(1): 139–142.

NSSE (National Survey of Student Engagement). 2017. "Past Summary Tables." Bloomington: Center for Postsecondary Research, Indiana University. Accessed May 1, 2016. http://nsse.indiana.edu/html/past_summary_tables.cfm

Zydney, Andrew L., Joan S. Bennett, Abdus Shahid, and Karen W. Bauer. 2002. "Faculty Perspectives Regarding the Undergraduate Research Experience in Science and Engineering." *Journal of Engineering Education* 91: 291–297. doi: 10.1002/j.2168-9830.2002.tb00706.x

Christopher S. Kim
Chapman University, cskim@chapman.edu

Christopher Kim is professor of earth and environmental sciences and associate dean of academic programs in the Schmid College of Science and Technology at Chapman University. As an environmental geochemist who investigates metal contamination in natural settings, specifically focusing on abandoned mine lands in California, he has raised more than $2 million in external funding to conduct environmental research with undergraduates at Chapman. Kim has served as a councilor in the Geosciences Division of the Council on Undergraduate Research, co-chaired the 2016 CUR Biennial Conference, and served as director of Chapman's Office of Undergraduate Research and Creative Activity from 2011 to 2015.

Anna Leahy is professor of English in the Wilkinson College of Arts, Humanities, and Social Sciences at Chapman University. She has served as the director of the Office of Undergraduate Research and Creative Activity since 2015 and also directs Tabula Poetica,

a poetry project at Chapman University that hosts an annual reading series and houses the journal TAB. *Leahy publishes widely in creative writing pedagogy and is currently researching how different fields define creativity.*

Lisa Kendrick is the administrative coordinator of the Office of Undergraduate Research and Creative Activity at Chapman University. A Chapman alumna, she maintains primary administrative oversight over the Faculty Student Research Banking program.