## APPENDIX H.

**UCLA Faculty Survey and UCLA Senior Survey Brief**

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## Background

The UCLA Faculty Survey was conducted as a component of a Widening Implementation & Demonstration of Evidence-Based Reforms (WIDER) planning grant awarded to UCLA in fall 2013 by the National Science Foundation (DUE 1347828), funding a project titled "Transforming the Culture of Teaching and Learning at UCLA: Development of a Change Strategy for STEM Education". With NSF support, UCLA is undergoing a broad self-examination of STEM educational practices, spanning faculty attitude and practice, administrative operations, and policy. With the participation of leadership, faculty, and administrators from all campus units involved in STEM education at UCLA, the goal is to identify and overcome barriers to individual, departmental, and institutional change as well as create opportunities and resources to leverage and promote a campus-wide transformation in STEM teaching and learning. The leadership for this project includes:

- **Patricia Turner (PI)**, Vice Provost and Dean of Undergraduate Education
- **Richard Wesel (Co-PI)**, Associate Dean of Engineering and Computer Sciences Academic and Student Affairs & Professor in Electrical Engineering
- **Arlene Russell (Co-PI)**, Faculty Director of the Science-Mathematics Initiative & Senior Lecturer (tenured) in Chemistry/Biochemistry
- **Blaire Van Valkenburgh (Co-PI)**, Associate Dean of Academic Programs in the Life Sciences & Professor in Ecology and Evolutionary Biology
- **Sylvia Hurtado (Co-PI)**, Director of the Higher Education Research Institute & Professor in the Graduate School of Education and Information Studies
- **Erin Sanders (Managing Director)**, Director of the Center for Education Innovation & Learning in the Sciences, Assistant Adjunct Professor in Microbiology, Immunology and Molecular Genetics, & Academic Coordinator in Life Sciences Core Education

The UCLA Senior Survey is annually administered by the Center for Educational Assessment in the Office of Instructional Development under the direction of **Marc Levis-Fitzgerald**, Director of Survey Research and Curricular Assessment. Over 8,000 graduating seniors in the College of Letters and Science, the School of the Arts and Architecture, and the School of Theater, Film, and Television are invited to participate in the survey. The goal is to measure students' views on various components of their curricular and co-curricular experiences as UCLA undergraduates, communicating the results to relevant campus units and departments.

## Data Analysis

The Higher Education Research Institute (HERI) Faculty Surveys were distributed to 3,252 UCLA course instructors in spring 2014. The survey opened June 5th and closed June 27th. Of those invited there were 1,018 respondents who fully or partially completed the survey (31% response rate)[1]. Of the 1,018 respondents, 307 (30%) indicated that their appointment was in a STEM field (for a list of specific departments categorized as "STEM" for the purposes of this report, see Table H-A1). The remaining 711 faculty respondents are considered to fall under the category of Humanities, Arts, and Social Sciences (HASS). The following report presents a summary of Faculty Survey responses to selected survey items that most directly relate to instructional practices, attitudes about teaching, perceptions of the learning environment, and undergraduate education at UCLA. A summary of results from the national survey as well as the complete survey instrument are available at the HERI website[1].

Faculty survey data in this appendix are supplemented as noted by student responses from the 2012-2014 administrations of the UCLA graduating Senior Survey.

Prompted by evidence from institutional data that underrepresented minority students (URMs) are graduating from UCLA with Bachelor's of Science degrees at rates disproportionate to their non-URM peers, descriptive analysis of an item on the graduating Senior Survey was conducted to explore reasons students switched from a STEM to a HASS major. Senior Survey results from 2013 and 2014 were analyzed, with more than 12,850 students completing the survey these two years. 6,795 students responded to the survey prompt "Were there any experiences as a student at UCLA that influenced your choice of major?" (52% response rate). Analysis of survey item responses focused exclusively on those students who had switched from a STEM to HASS major (approximately 11% of respondents).

For all tables and figures, asterisks denote significant differences between STEM and HASS responses at a $p < .05$ level.

[1] This response rate was high enough for UCLA to be included in the 2013-2014 HERI Faculty Survey monograph as part of national norms for research universities: see http://www.heri.ucla.edu/facPublications.php.

## Summary of Survey Data

### Demographics: HERI Faculty Survey

Among all survey participants, 920 faculty indicated their gender (response options include "Male" and "Female") and 661 reported at least one racial/ethnic identity. The following tables (H-1 and H-2) summarize respondents' demographic characteristics and campus-wide statistics based on all ladder faculty as well as all faculty, including non-ladder[2]. The demography of survey respondents, in comparison to campus-wide statistics, indicates a similar representation of white faculty and a slight overrepresentation of female respondents in the sample.

Table H-1
*Faculty Survey Respondents, by Gender (in %)*

| | Male | Female |
|---|---|---|
| STEM (N=306) | 64.1 | 35.9 |
| HASS (N=614) | 55.0 | 45.0 |
| All Respondents (N=920) | 58.0 | **42.0** |
| UCLA All Ladder (N=1416.7 FTE) | 67.3 | 32.7 |
| UCLA All Faculty, Including Non-Ladder (1964.4 FTE) | 61.8 | **36.8** |

*Note:* For Tables H-1 and H-2, gender and race statistics were not available by department or division for non-ladder faculty. All respondents (N=920) include full-time undergraduate faculty, part-time undergraduate faculty, academic administrators, lecturers, graduate faculty, and other respondents who identify gender.

Table H-2
*Faculty Survey Respondents, by Race/Ethnicity (in %)*

| | Black | AI/AN | Asian/ NH/PI | Latino | White | Other | Two or More |
|---|---|---|---|---|---|---|---|
| STEM (N=300) | 1.3 | 0.3 | 18.3 | 2.7 | 74.3 | 1.7 | 1.3 |
| HASS (N=361) | 3.6 | 0.3 | 14.7 | 7.5 | 69.5 | 3.0 | 1.4 |
| All Respondents (N=661) | 2.6 | 0.3 | 16.3 | 5.3 | **71.7** | 2.4 | 1.4 |
| UCLA All Ladder (N=1416.7 FTE) | 4.0 | 0.7 | 17.6 | 6.0 | 71.2 | 0.5 | - |
| UCLA All Faculty, Including Non-Ladder (1964.4 FTE) | 3.4 | 0.6 | 17.7 | 6.2 | **70.7** | 1.4 | - |

*Note:* The multiracial/multiethnic category is not calculated for UCLA reports. HERI categorizes faculty race based on a survey item that allows participants to mark all racial/ethnic groups that apply. Options include: White/Caucasian, African American/Black, American Indian/Alaska Native, Asian American/Asian, Native Hawaiian/Pacific Islander, Mexican American/Chicano, Puerto Rican, Other Latino, Other.

[2] Source: AAAP 2014-15 Utilization Tables

## Teaching Load and Courses

Faculty members were asked "During the present term, how many hours per week on average do you actually spend on scheduled teaching?" Response options include: None, 1-4, 5-8, 9-12, 13-16, 17-20, 21+.

Figure H-1 presents a summary of faculty's reported time spent teaching (i.e., actual, not credit hours) during the spring 2014 term, in hours per week. Faculty from either group most commonly reported teaching "1–4" hours per week, with 47.9% of STEM faculty and 35.5% of HASS faculty reporting as much. For both STEM and HASS departments, fewer than 2.5% of respondents reported teaching more than 16 hours per week ("17-20" or "21+"); these data labels are omitted from the figure. These results indicate that faculty respondents experience a similar teaching load across disciplines, reporting an average between 1-4 and 5-8 hours per week.

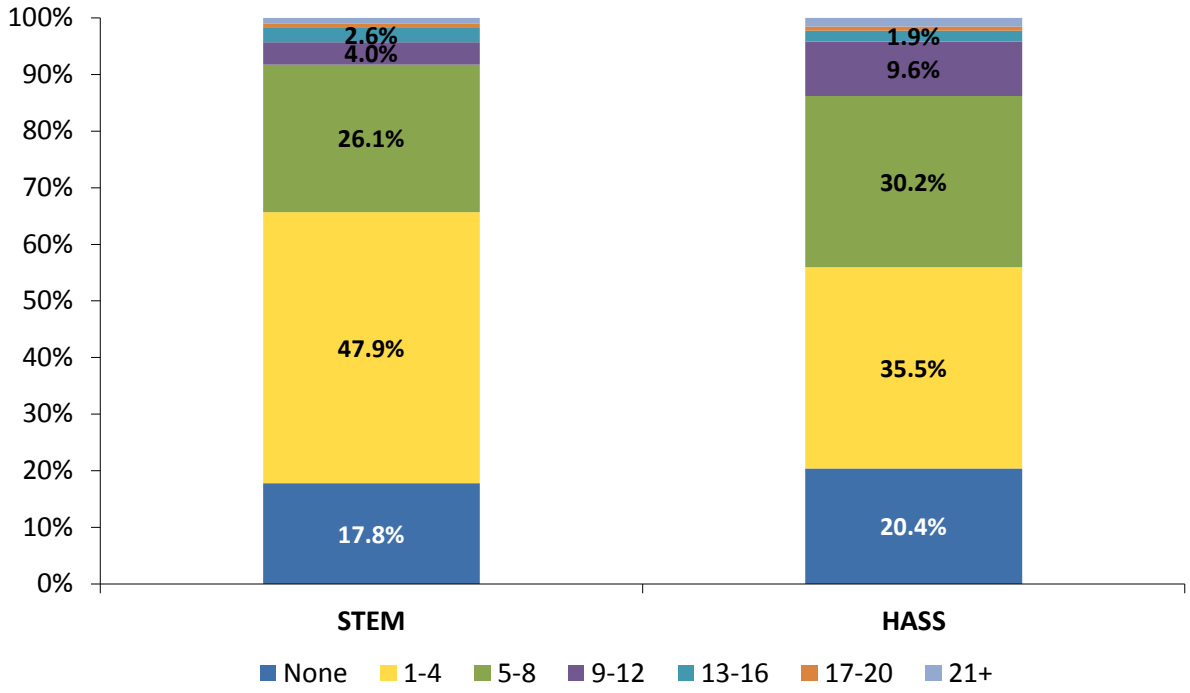


*Figure H-1*. Hours per week spent teaching in Spring 2014.

Faculty members were asked to respond to the question, "How many courses are you teaching this term (include all institutions at which you teach)?" Faculty who reported teaching at least one course were then asked specifically about the different types of courses they taught, "How many of the courses that you are teaching this term are:

- General education courses
- Courses required for an undergraduate major
- Other undergraduate credit courses
- Developmental/remedial courses (not for credit)

Figure H-2 presents a summary of faculty's average number of courses taught during the Spring 2014 term. ***On average, STEM and HASS faculty reported similar course loads*** for all types of courses with the exception of general education courses ($\bar{x}_{STEM}$=0.26, $\bar{x}_{HASS}$=0.41) and courses required for undergraduate majors ($\bar{x}_{STEM}$=0.68, $\bar{x}_{HASS}$=0.98). For both of these course types, HASS faculty reported significantly larger teaching loads at a $p$ <.05 level.

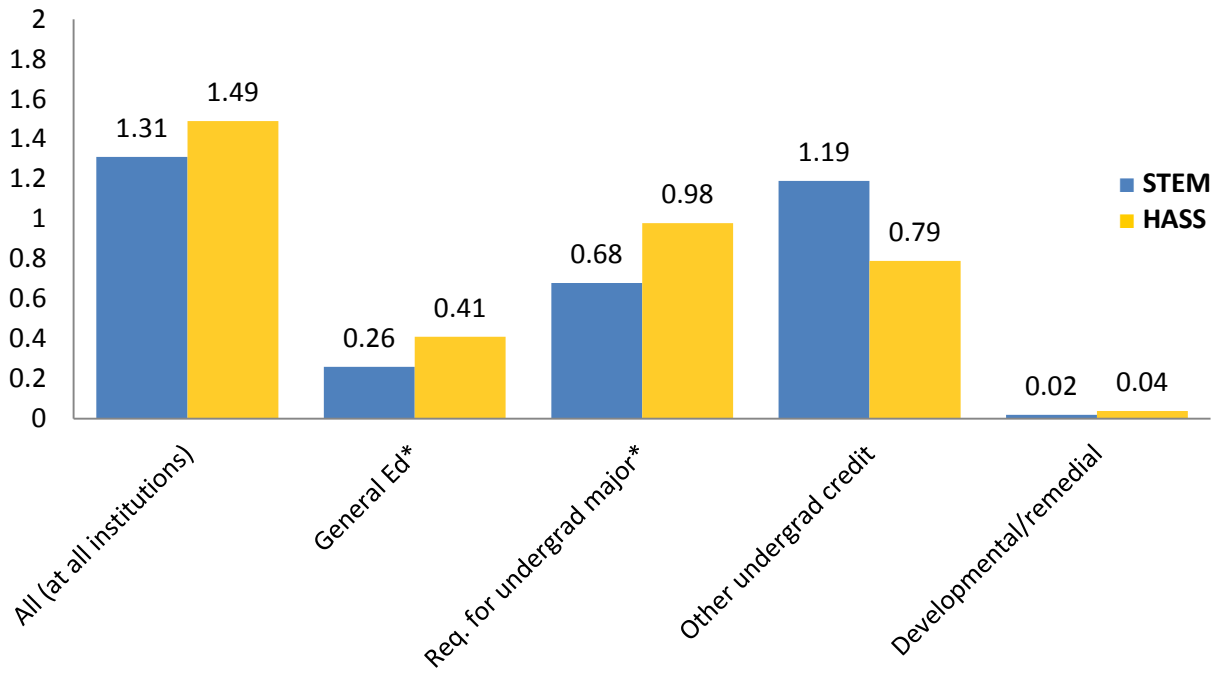


*Figure H-2.* Average teaching load in Spring 2014, by course type

Faculty members were also asked to indicate (mark "Yes") whether, "During the past two years, have you engaged in any of the following activities?

- Taught an exclusively web-based course at this institution

***Very few faculty in either STEM or HASS fields reported having taught an exclusively web-based course at UCLA*** during the past two years, only 5.0% and 2.9%, respectively. The difference between STEM and HASS responses is not statistically significant.

## Activities Outside of the Classroom

Table H-3 presents a summary of faculty responses regarding their activities with students outside of the classroom. HASS faculty reported having supervised an undergraduate thesis in the past two years at significantly higher rates than their STEM colleagues (45.4%, as compared to 36.2%). However, STEM faculty reported higher rates of working with undergraduate students on research, both generally (81.2%, as compared to 66.4%) and on their own projects (76.3%, as compared to 57.3%). STEM and HASS faculty report nearly equivalent levels of involvement with student groups participating in service/volunteer activities (47.5% for STEM, 42.1% for HASS). These results suggest that overall, ***UCLA faculty are engaging undergraduates in a variety of scholarly and service activities.***

*Table H-3 During the Past Two Years, Have You Engaged in Any of the Following Activities? (% who Marked "Yes")*

| | STEM | HASS | Sig. Diff. ($p$ <.05) |
|---|---|---|---|
| Supervised an undergraduate thesis | 36.2 | **45.4** | * |
| Worked with undergraduates on a research project | **81.2** | 66.4 | * |
| Engaged undergraduates on *your* research project | **76.3** | 57.3 | * |
| Advised student groups involved in service/volunteer work | 47.5 | 42.1 | |

Figure H-3 summarizes faculty responses regarding scholarly collaboration with undergraduate students. A larger proportion of STEM faculty reported that they presented with students at conferences (41.7%) and published with undergraduates (51.0%) to a "great" or to "some extent," compared to HASS respondents (21.7% and 22.1%, respectively). Taken together, while STEM faculty respondents appear to involve UCLA undergraduates in scholarly collaboration more frequently than HASS faculty, these results may point to a ***need to expand opportunities for undergraduates across campus to participate in formal conferences or contribute to publications***.

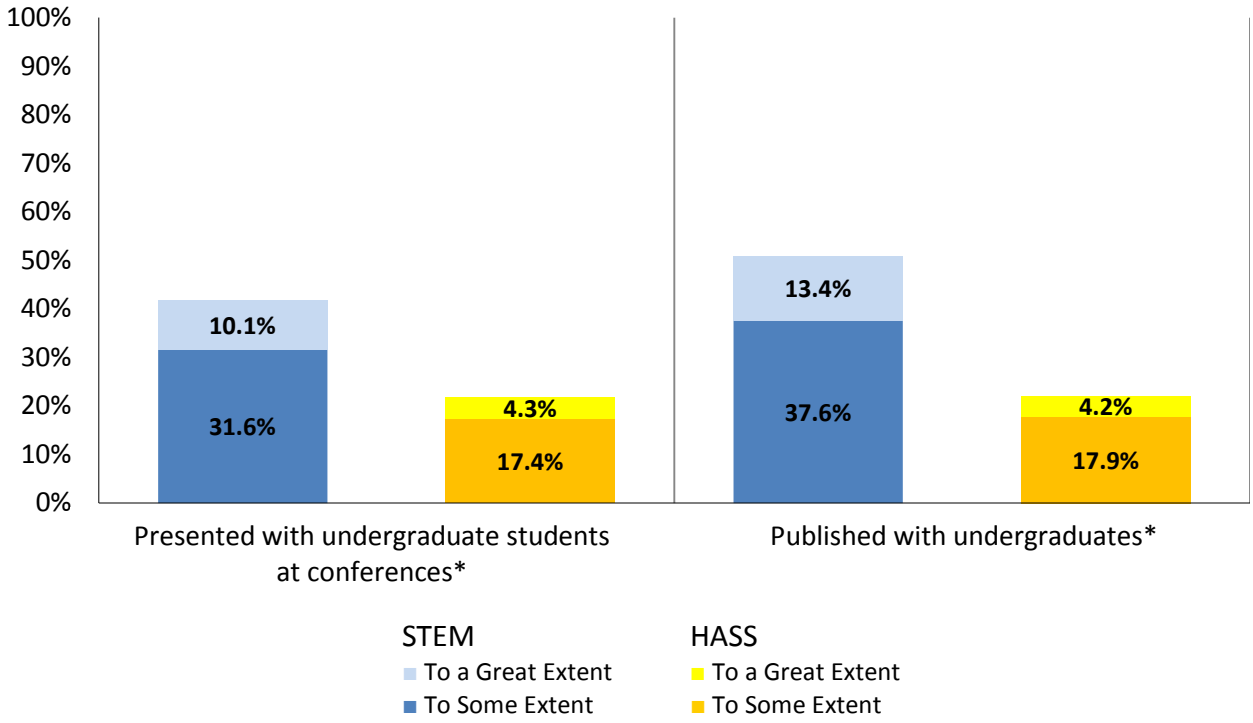


*Figure H-3.* Scholarly collaboration with undergraduates in past two years

## Goals for Undergraduate Education

Table H-4 summarizes faculty's reported goals for undergraduate education with respect to survey items categorized as higher order cognitive skills (Anderson & Krathwohl, 2001) and those that relate to diversity in the classroom. Nearly all STEM and HASS faculty indicated that the ability to think critically is an "essential" or "very important" education goal (98.3% and 98.9%, respectively). Compared to STEM faculty, more faculty in HASS departments reported that they consider it "essential" or "very important" for undergraduate education to help students evaluate the quality and reliability of information (74.5% versus 52.2%). This difference between groups is somewhat surprising given the importance STEM disciplines place on peer review of scholarly work, where reproducibility and statistical significance are an essential aspect of evaluation and critical to high quality and reliable experimental data worthy of publication.

More HASS faculty than STEM faculty reported that they consider it "essential" or "very important" for undergraduates to enhance their knowledge of and appreciate for other racial/ethnic groups (68.8% versus 49.4%) and to teach students tolerance and respect for different beliefs (81.4% versus 65.6%). These results indicate that ***attention to diversity issues in STEM classrooms and among STEM faculty could be improved.***

Table H-4
*Indicate the importance to you of each of the following education goals for undergraduate students (% "Essential" or "Very Important")*

| | STEM | HASS | Sig. Diff. ($p$ <.05) |
|---|---|---|---|
| *Higher Order Cognitive Skills* | | | |
| Develop ability to think critically | 98.3 | 98.8 | |
| Help students evaluate the quality and reliability of information | 52.2 | **74.5** | * |
| *Diversity* | | | |
| Enhance students' knowledge of and appreciation for other racial/ethnic groups | 49.4 | **68.8** | * |
| Teach students tolerance and respect for different beliefs | 65.6 | **81.4** | * |

## Classroom and Curricular Diversity

Figure H-4 shows faculty's level of agreement with statements regarding classroom and curricular diversity. Nearly all HASS and STEM faculty agreed that the educational experience of all students is enhanced by a racially/ ethnically diverse student body. 65.4% of HASS faculty agreed "strongly" or "somewhat" that racial and ethnic diversity is reflected in the curriculum, as compared to 54.0% of STEM faculty. This finding likely reflects content in HASS courses, as compared to STEM courses, which lends itself more readily to discussions of race/ethnicity and discourse about student beliefs on different topics. With respect to feeling prepared to deal with conflict over diversity issues in the classroom, only a small percentage of faculty in either discipline (10.3% STEM, 12.5% HASS) agreed "strongly" with this statement. ***Almost half of all faculty respondents, irrespective of discipline, do not feel prepared to handle conflicts, suggesting a need to provide faculty training and tools of practice surrounding diversity issues in the classroom.***

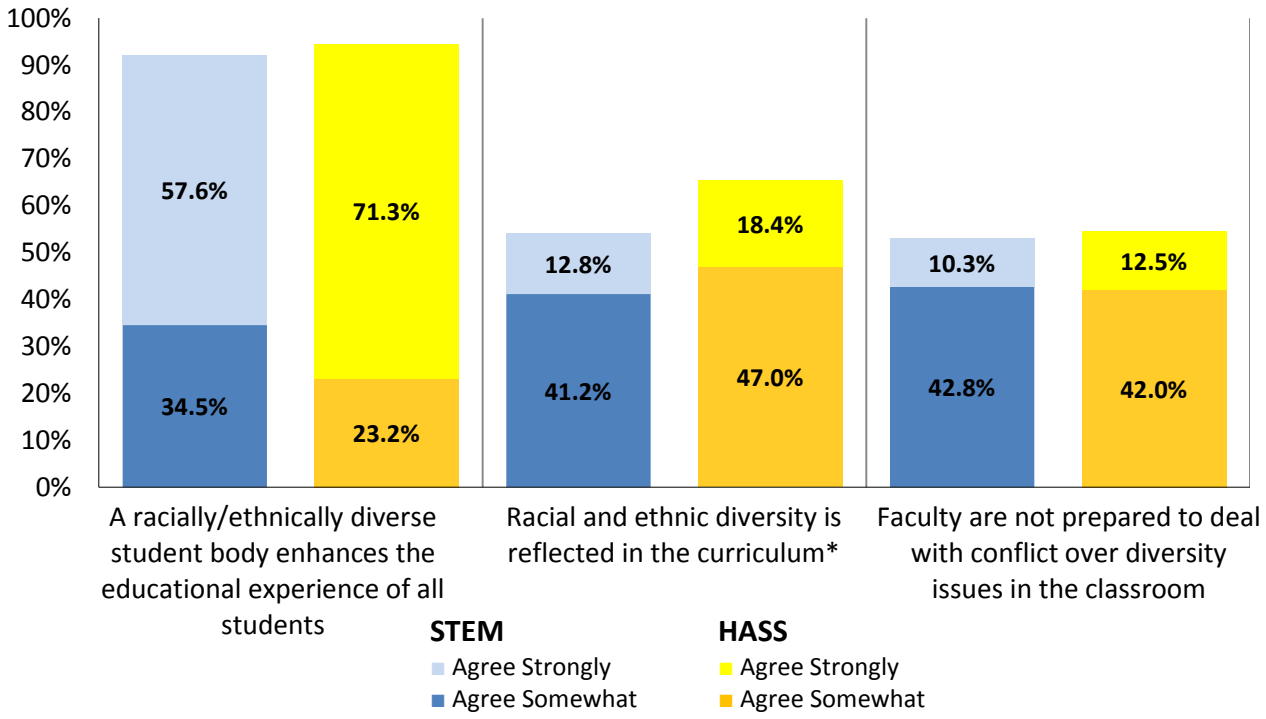


*Figure H-4.* Faculty views on classroom and curricular diversity

## Student Preparedness

Figure H-5 summarizes faculty views on their students' level of preparation for coursework. Significantly more faculty in STEM departments agreed that most students are well-prepared academically, as compared to their colleagues in HASS departments (70.5% compared to 59.7%). This result raises two important questions – how do faculty know that students are well-prepared for their coursework? Do they evaluate their knowledge and skill level of students at the beginning of their course?

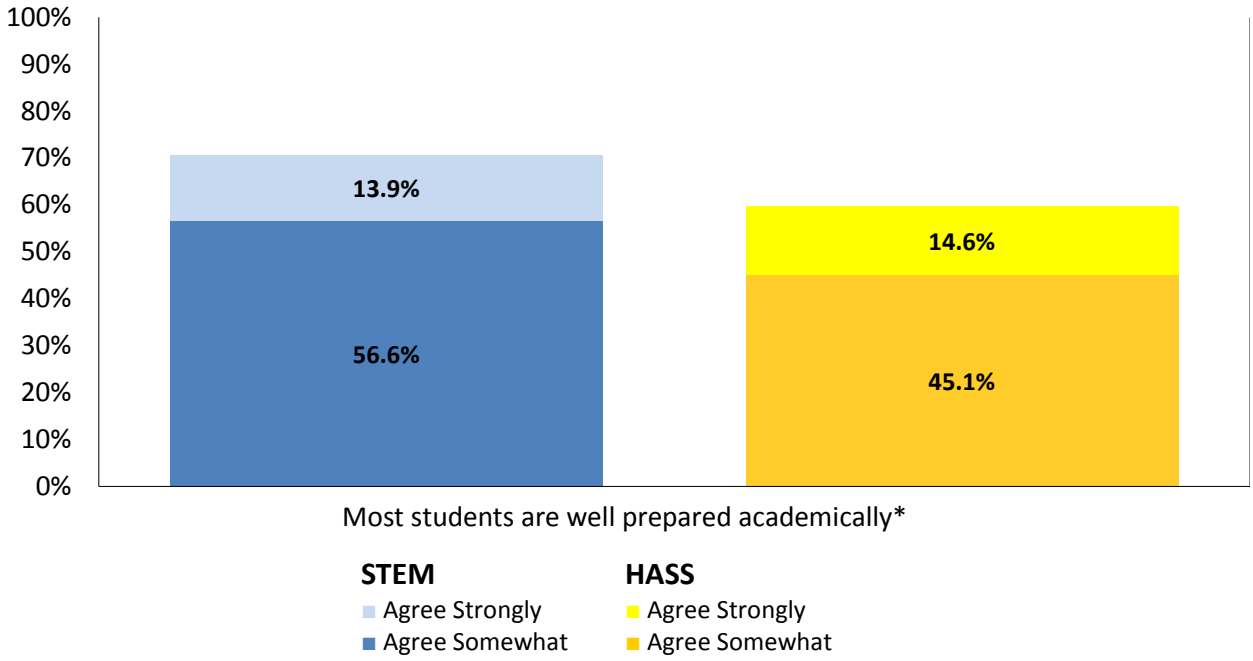


*Figure H-5.* Faculty views on student preparedness

Another question on the survey prompted faculty to consider this issue when they were asked, "Do you evaluate whether or not students enter your classes with sufficient skills or knowledge of concepts, ostensibly learned in previous courses, and if so, how?" Response options include: Other, Portfolio or inventory of prior courses or experiences, Students' self-report survey, Diagnostic test or quiz, N/A.

Figure H-6 presents a summary of faculty's methods for assessing students' preparation for their courses. For both STEM and HASS departments, faculty similarly and most commonly reported that they do *not* evaluate prerequisite skills or knowledge (60.4% and 56.3%, respectively).

Taken together, these findings (Figure H-5 and H-6) begin to raise the question of whether UCLA faculty are making assumptions about student academic preparedness, and may thus suggest a ***need for faculty to utilize more diagnostic testing (pre/post assessments) or other instruments designed to inform faculty of student readiness for their courses***. To effectively assess student learning, faculty should know where students begin regarding prior knowledge relevant to the course.

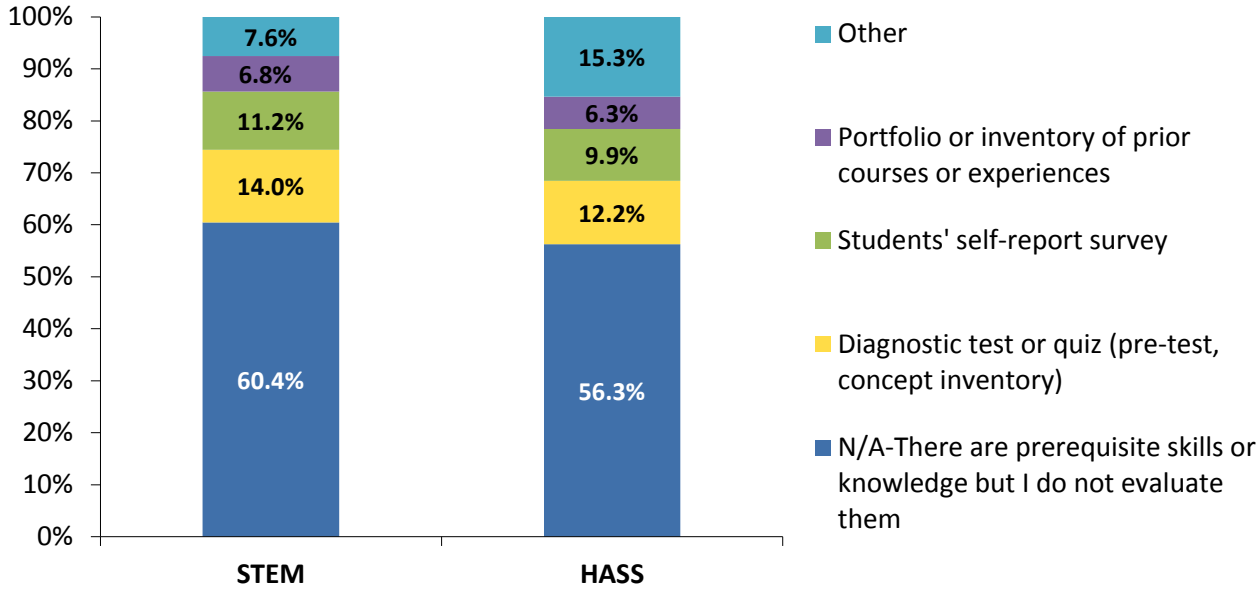


*Figure H-6.* Evaluation of Students' Academic Preparedness

## Student Learning Environment

Figure H-7 presents faculty's views on students' academic success. STEM and HASS faculty agreed "strongly" or "somewhat" at similar rates across all three items. It is important to note that a majority of faculty agree strongly (over 89%) that they encourage all students to approach them for help. However, first year students (not included in current UCLA surveys) rely on faculty accessibility cues and are often intimidated to approach faculty until after completing introductory courses (Gasiewski, Eagan, Garcia, Hurtado & Chang, 2012). The majority of faculty also agree strongly or agree somewhat that it is primarily up to individual students to succeed in their courses; only a small proportion take primary responsibility for student learning. And while ***the majority of faculty state that they try to dispel perceptions of completion***, this is contrary to actual practices that appear to happen in the classroom, as indicated by responses to a prompt on the graduating Senior Survey, in which seniors report great competition for grades in their major (Figure H-8).

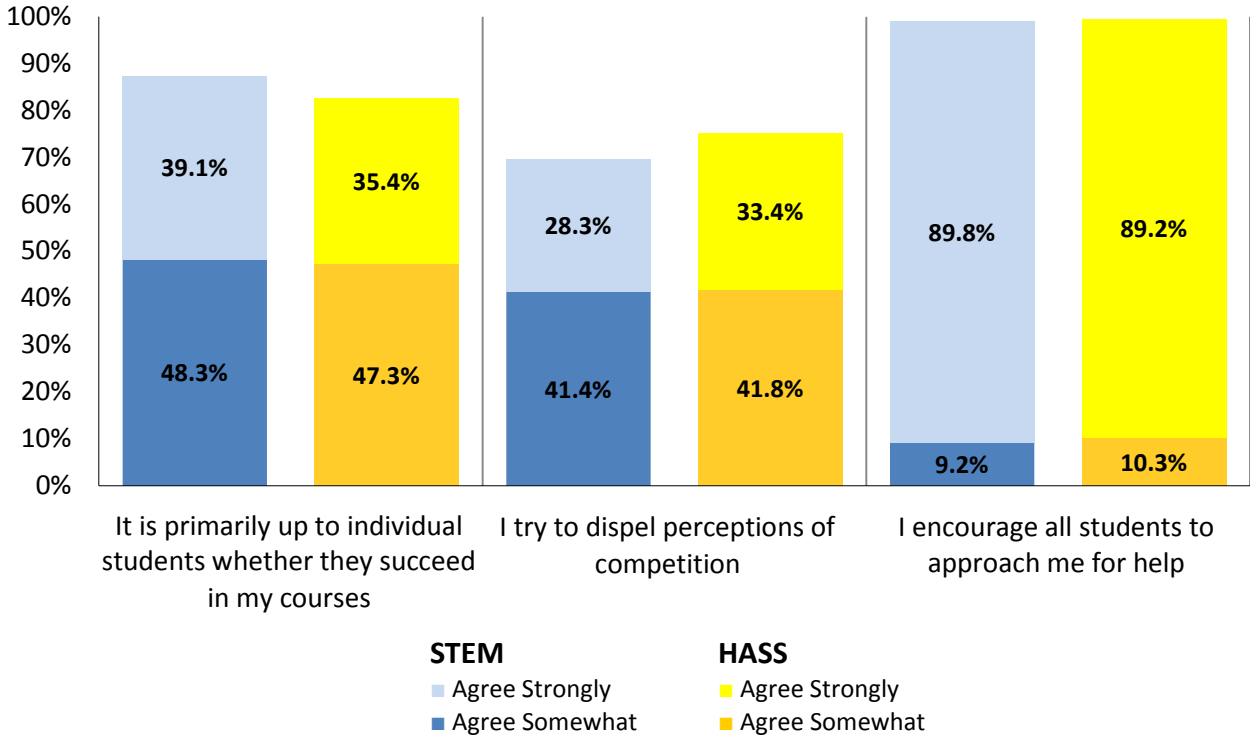


*Figure H-7.* Faculty Views on Student Academic Success

Figure H-8 summarizes graduating senior *students'* survey responses regarding their perceptions of their peers and faculty. ***Students in STEM majors are significantly more likely (p<.05) than HASS students to perceive intense competition for grades (80.3% compared to 61.8%) despite faculty reporting that they try to dispel perceptions of competition at similar rates across both departmental categories*** (see Figure H-7). Generally speaking, UCLA seniors are satisfied with the accessibility of faculty outside of class, although STEM students report somewhat less satisfaction with faculty accessibility as compared to their HASS peers (86.9% compared to 90.1%). Further, it is important to note that these data do not include the responses of freshman who likely to do not see the same level of faculty accessibility until they are in the major.

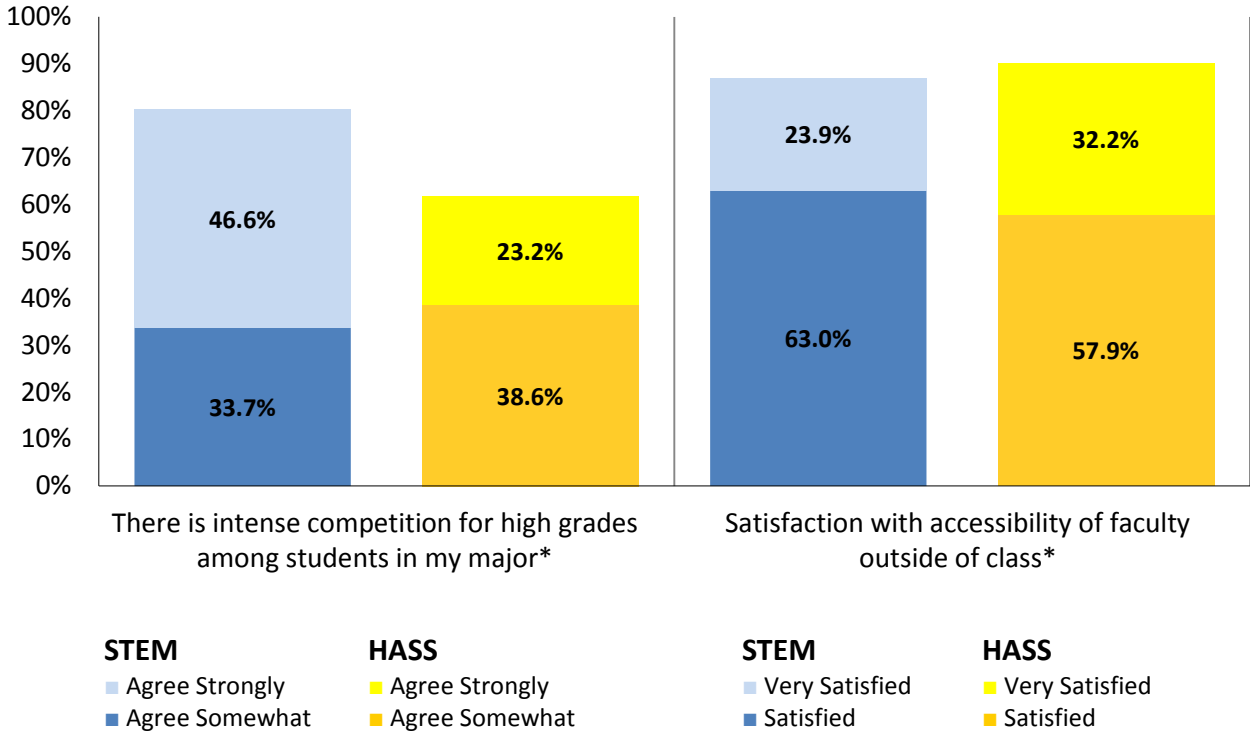


*Figure H-8.* Student views on peers and faculty[3]

[3] Source: 2012-2014 UCLA Senior Surveys

## Pedagogical Practices

Faculty were asked, "In how many of the courses that you teach do you use each of the following?

- Student presentations
- Student evaluations of each others' work
- Class discussions
- Cooperative learning (small groups)
- Experiential learning/Field studies
- Group projects
- Student-selected topics for course content
- Reflective writing/journaling
- Using student inquiry to drive learning
- Extensive lecturing
- Grading on a curve"

Response options include: All, Most, Some, None.

Table H-5 summarizes faculty's use of student-centered practices (the first nine items in the above list), in contrast to extensive lecturing and grading on a curve (the last two items) in "all" or "most" of their courses.

Table H-5
*Teaching Practices (% Faculty Use in "All" or "Most" Courses)*

| | STEM | HASS | Sig. Diff. ($p$ <.05) |
|---|---|---|---|
| *Student-Centered Practices* | | | |
| Student presentations | 49.3 | 53.2 | |
| Student evaluations of each others' work | 22.4 | **30.0** | * |
| Class discussions | 73.4 | **82.0** | * |
| Cooperative learning (small groups) | 49.8 | 49.4 | |
| Experiential learning/Field studies | 26.5 | 29.8 | |
| Group projects | 39.0 | 38.0 | |
| Student-selected topics for course content | 21.9 | **30.4** | * |
| Reflective writing/journaling | 12.4 | **23.3** | * |
| Using student inquiry to drive learning | 45.5 | 50.9 | |
| *Traditional Instructional Practices* | | | |
| Extensive Lecturing | **64.6** | 50.5 | * |
| Grading on a curve | **40.6** | 24.3 | * |

For five of nine survey items categorized as student-centered practices, there was little difference between STEM and HASS faculty with regard to the frequency with which these instructional techniques were employed. Overall, class discussions were most commonly cited as an instructional practice used in "all" or "most" courses, irrespective of discipline, although HASS faculty reported using this technique more frequently than STEM faculty (82.0% compared to 73.4%). Compared to their STEM colleagues, HASS faculty also were more likely to report using student evaluations of each others' work (30.0% compared to 22.4%), student-selected topics for course content (30.4% compared to 21.9%), and reflective writing/journaling (23.3% compared to 12.4%). Notably, none of these instructional techniques was used *frequently* by HASS faculty. Given that reflective writing/journaling is considered a simple and effective strategy to encourage metacognition, a self-assessment process that helps students identify concepts for which they have misconceptions or that they do not understand completely (Kober, 2015; Singer *et al*., 2012), these results suggest faculty may need to be encouraged to use this instructional technique in their classrooms campus-wide. This may be especially important given the view faculty expressed, as shown in Figure H-7, about students being responsible for their own success. Reflective writing/journaling provides an excellent opportunity for students to self-evaluate their level of conceptual understanding in a course.

***Survey findings highlight the extent to which extensive lecturing is utilized as an instructional modality campus-wide.*** Moreover, in comparison to their relative under-utilization of student-centered practices, STEM faculty were more likely to report using extensive lecturing in their courses (64.6%, as compared to 50.5% in HASS) as well as assign grades using a "curve" (40.6%, as compared to 24.3% in HASS). Given that lecturing is a passive mode of information transfer, it is likely that few students will engage in meaningful conceptual understanding of course material if this strategy is used as the primary pedagogy in classrooms (Kober, 2015; Singer *et al*., 2012). Interspersing lectures with interactive, student-centered teaching approaches is much more effective at promoting student learning and creating an equitable, inclusive learning environment. In addition, ***grading on a curve, in which students are evaluated relative to the performance of others in their class and grades are assigned to fit into a fixed number of high grades (quotas) or a pre-determined distribution (such as a bell curve), does not align well with student-centered pedagogies that foster collaboration and peer learning*** (Kober, 2015).

Figure H-9 presents a summary of faculty's pedagogical practices, showing the distribution of faculty with regard to the number of student-centered methods used in "all" or "most" of their classes, as well as the proportion of faculty who use extensive lecturing in "all" or "most" of their classes. Across campus, faculty reported using an average of 3.68 student-centered practices in "all" or "most" of their classes. 45.9% of STEM faculty reported using an above-average number (4 or more) of student-centered methods, while 49.3% of HASS faculty reported above-average use.

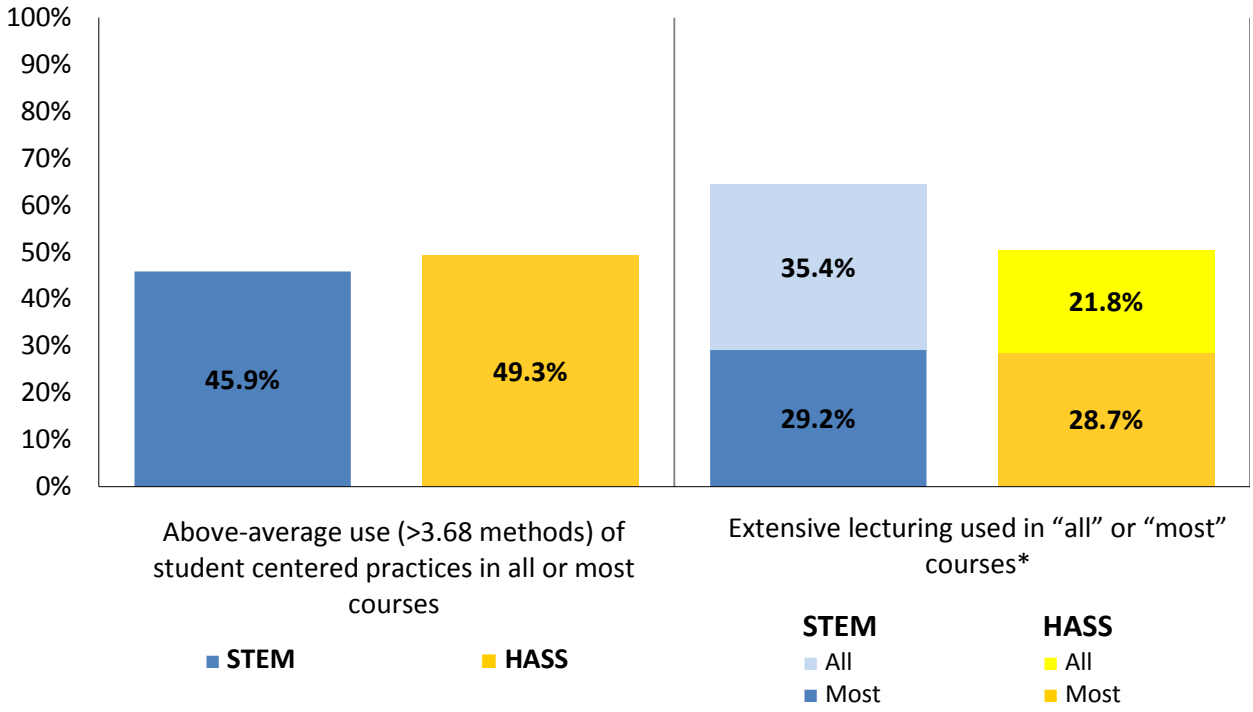


*Figure H-9.* Pedagogical practices

## Resources for Student Learning

Faculty were asked the open-ended question, "Do you publicize the learning goals for your class(es) to your undergraduate students? If so, how?" Responses were coded into the categories presented in Table H-6, below. Responses indicating multiple methods of communicating learning goals were coded accordingly, thus sub-code percentages do not add up to 100%.

The large majority of all faculty (87.2%) reported that they publicize their learning goals in some form, often through multiple means. Faculty most commonly mentioned using a syllabus as a way of communicating learning goals to their students (63.2% of all "Yes" responses). Among faculty who indicated that they did not publicize learning goals, the majority did not offer an explanation.

Results from the UCLA Senior Survey indicate that only 71.0% of students often view the syllabus when posted on a course website. Thus, if the syllabus is used by instructors as the primary means by which to communicate course learning goals, as part of a campus-wide effort, faculty should be transparent expectations and their evaluation criteria used in grading, and efforts should be made to encourage all students to view the syllabus and ask questions about the basis for their learning assessment.

Table H-6
*Communication of Learning Goals (N=494)*

| | Freq. | % |
|---|---|---|
| "*Yes*" Responses (total) | 431 | 87.2 |
| Syllabus | 312 | **63.2** |
| Discussion (in class, meetings, or office hours) | 218 | 44.1 |
| Online post (CCLE, Blackboard, etc.) | 106 | 21.5 |
| Explanation of projects, assignments, exams, etc. | 71 | 14.4 |
| Unspecified or other | 39 | 7.9 |
| Slides, notes, handouts | 10 | 2.0 |
| Emails | 7 | 1.4 |
| *"No," "Not Applicable,"* or Other Responses (total) | 63 | 12.8 |
| No (unspecified or miscellaneous) | 44 | 8.9 |
| Not applicable | 15 | 3.0 |
| Other (ambiguous response) | 4 | 0.8 |

## Institutional Support for Professional Development and Instruction

Faculty were asked to indicate the extent to which they agree or disagree with the following statements about their college or university: "There is adequate support for faculty development". Response options include: Agree Strongly, Agree Somewhat, Disagree Somewhat, Disagree Strongly.

Faculty were also asked to indicate how well the following statement describes their college or university: "Faculty are rewarded for being good teachers". Response options include: Very Descriptive, Somewhat Descriptive, Not Descriptive.

Figure H-10 presents a summary of faculty views regarding institutional support for development and instruction. Similar proportions, albeit less than 60%, of faculty across STEM and HASS departments reported that they perceived adequate support for faculty development (53.3% and 57.5%, respectively). Notably, few reported "strong" agreement with this statement (15.3% STEM and 8.7% HASS). Additionally, few faculty, irrespective of discipline, reported that being rewarded for being good teachers was "very descriptive" of the UCLA culture (20.4% STEM and 13.6% HASS). About half of faculty reported that being rewarded for good teaching is "somewhat descriptive," while the remainder (approximately 40%) did not think this statement is descriptive of UCLA culture at all. Together, these findings suggest ***greater emphasis and value could be placed in supporting faculty development efforts and rewarding those who engage in effective teaching practices at UCLA***.

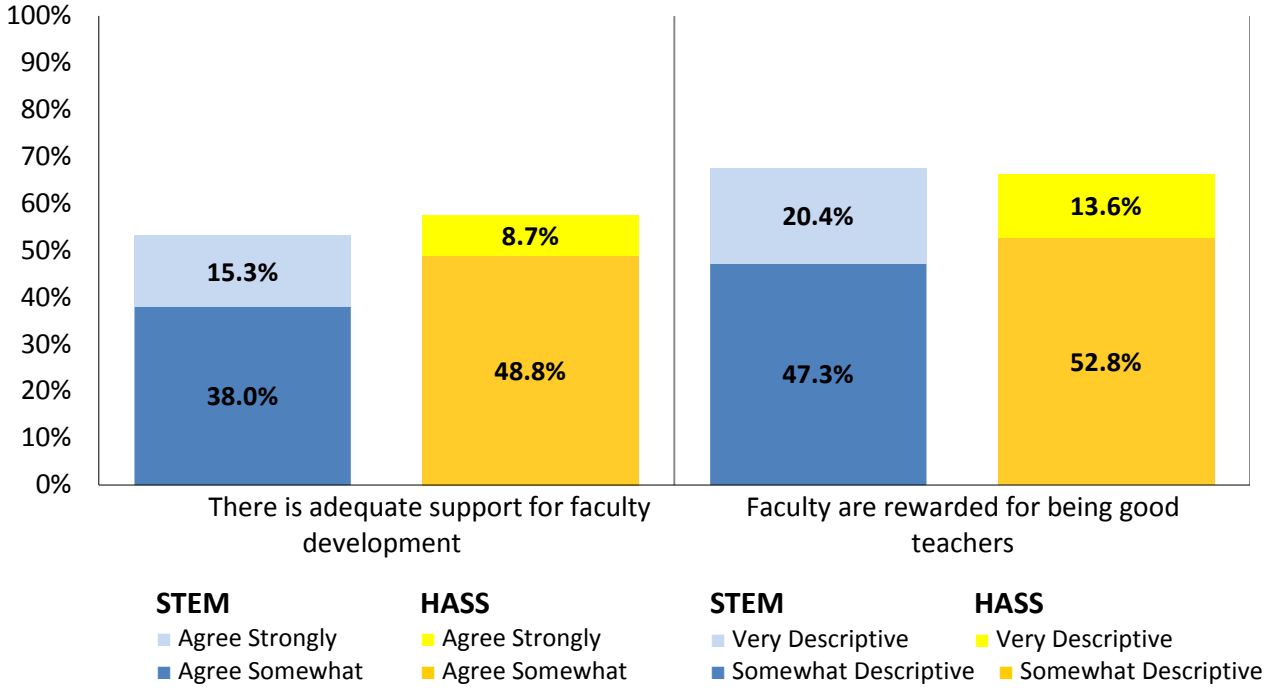


*Figure H-10.* Views on development and instruction

Faculty were asked to indicate (mark "Yes") whether, "During the past two years, have you engaged in any of the following activities?

- Participated in organized activities around enhancing pedagogy and student learning"

As shown in Figure H-11, while STEM and HASS faculty had similar responses (38.7% and 41.1% marked "yes", respectively), fewer than half of faculty respondents from the two disciplinary groups recently engaged in professional development activities surrounding teaching at all. In part, this finding may result from inadequate support provided at the department or institutional level for these efforts. Alternatively, these responses may suggest a lack of interest on the part of faculty to participate; however, responses to the next survey item (Figure H-12) suggest otherwise.

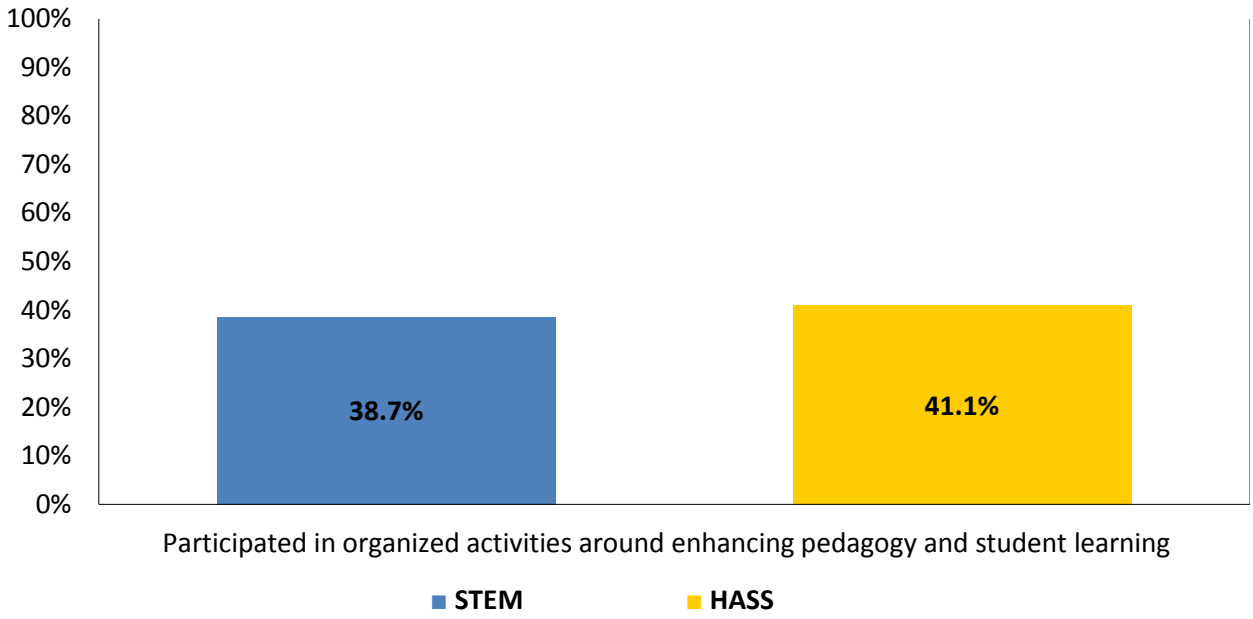


*Figure H-11.* Participation in professional development, percentage who marked "yes"

Faculty were asked, "Would you be interested in participating in a formal mentoring program with respect to teaching if one were offered through either your department or by another campus unit?" Response options include: Yes, No, or N/A as described in the legend for Figure H-12 below.

The majority of both STEM (61.5%) and HASS (56.3%) faculty indicated they would be interested in participating in a formal mentoring program with respect to teaching. Some STEM and HASS departments already offer such programs, with some faculty who are already actively participating (11.9% and 15.0%, respectively) and others indicating no interest in participating (26.5% and 28.7%, respectively). Overall, these responses indicate a ***need to expand and formalize faculty development opportunities that relate to effective and inclusive teaching practices***.

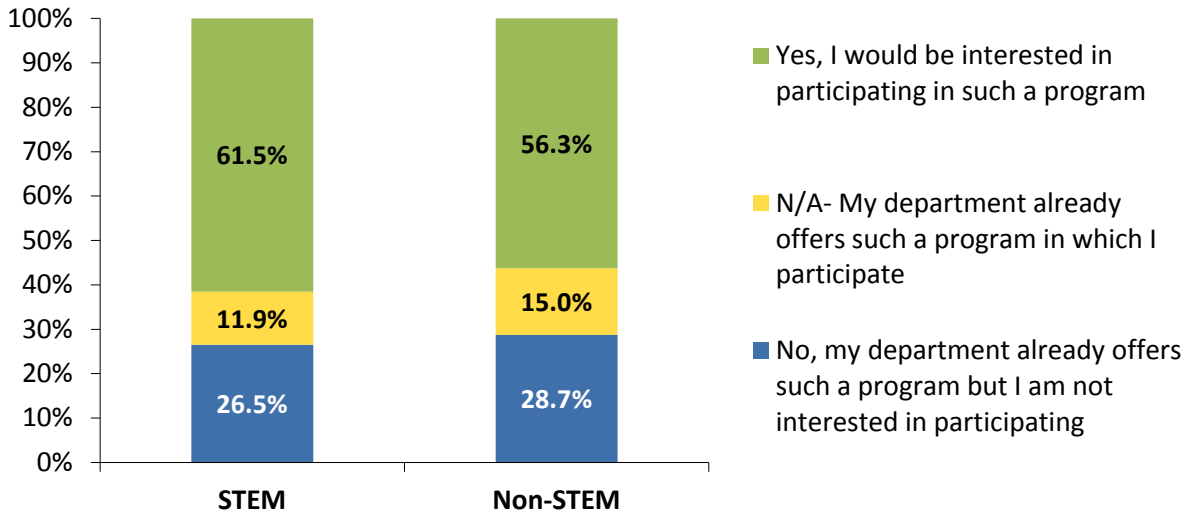


*Figure H-12.* Availability and demand for formal mentoring for instruction

Faculty were asked, "In the last *ten years*, have you ever applied for any mini-grants or Instructional Improvement Program (IIP) grants from the UCLA Office of Instructional Development (OID)?" Response options include: Yes—I applied and received OID grant monies, Yes—I applied but was not awarded the grant monies, No—I knew about these grants but did not apply for them, No—I do not know about OID mini-grants or IIP grants.

Figure H-13 shows a summary of faculty's awareness and/or receipt of OID instructional development funds. Compared to their HASS colleagues, significantly fewer STEM faculty reported having applied for funds (22.3%, as compared to 44.8%). Moreover, STEM faculty more often reported that they did not know about OID mini-grants or Instructional Improvement Program (IIP) grants (38.4%, as compared to 20.7% of HASS faculty). These grant monies exist on campus as a resource for faculty to competitively apply for and receive funding to support instructional innovation and pedagogical experimentation in undergraduate courses. ***Far too few faculty, irrespective of discipline, are utilizing this important resource.*** In addition to raising awareness, departmental chairs could encourage their faculty to apply for OID grants as well as recognize and reward their faculty for using these grants to support curriculum development. Such efforts are critical to building departmental cultures that support implementation of evidence-based teaching practices.

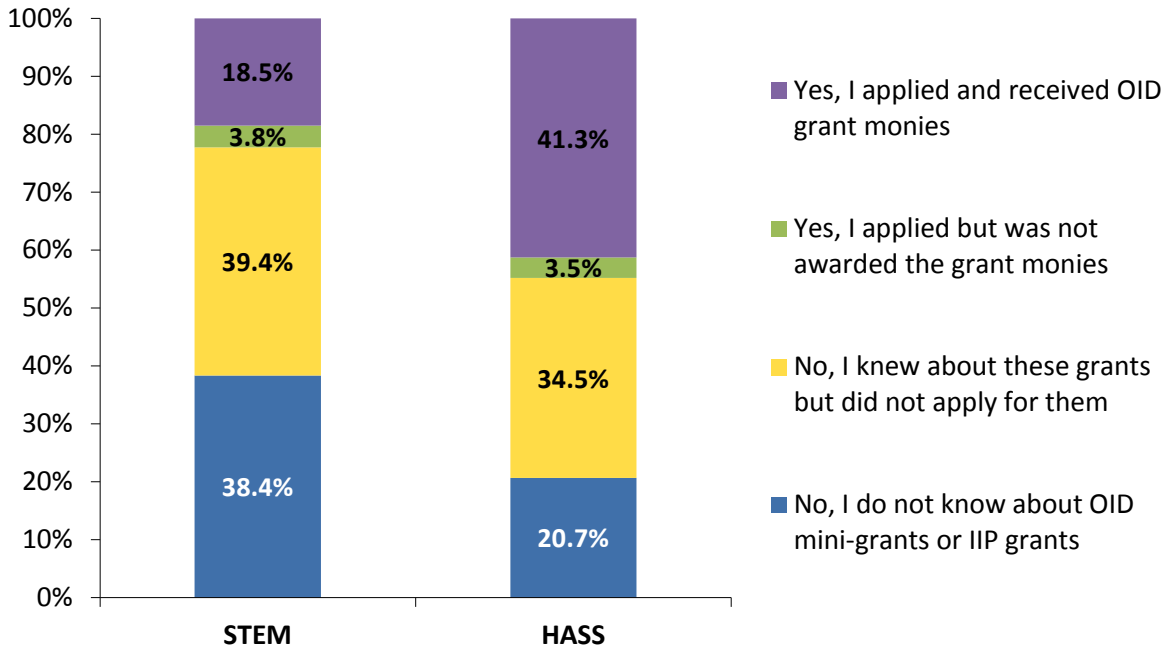


*Figure H-13.* Use and awareness of OID funds

## Views on Graduate Student Training as Teaching Assistants

Table H-7 presents a summary of faculty's views on graduate student training with regard to teaching. HASS and STEM faculty largely agree that it is important for UCLA graduate students to serve as a Teaching Assistant for at least one term (84.1% and 88.4%, respectively). Compared to their STEM colleagues, HASS faculty are more likely to agree that graduate students in their program receive adequate instruction on becoming good instructors (66.9% compared to 56.3%). This finding is somewhat alarming considering the critical role Teaching Assistants play in undergraduate instruction at UCLA, a campus dominated by large enrollment courses where the overall effectiveness of instruction is reflected in the quality of an instructor as well as the ability and capacity of Teaching Assistants to positively augment the students' learning experience. ***These results call for improvements to be made in the training of Teaching Assistants across campus.***

Table H-7
*Faculty Views on Graduate Student Training (% Agree "Strongly" or "Somewhat")*

| | STEM | HASS | Sig. Diff. ($p$ <.05) |
|---|---|---|---|
| It is important for graduate students in this program to spend at least one term as a Teaching Assistant | 84.1 | 88.4 | |
| Graduate students in this program receive adequate instruction on becoming good teachers | 56.3 | **66.9** | * |

## Reasons for Switching from STEM to HASS Majors at UCLA

Table H-8 summarizes the responses undergraduate students gave to the prompt on the 2013 and 2014 graduating Senior Surveys, "Were there any experiences as a student at UCLA that influenced your choice of major?". Following the table are samples of student responses to this open-ended question.

Table H-8
*Experiences Influencing Major Choice*

| Theme | All Students | | Non-URM Students | | URM Students | |
|---|---|---|---|---|---|---|
| | Frequency | Percent** | Frequency | Percent** | Frequency | Percent** |
| **Positive Experience or Influence ("pull")** | **426** | **50.8%** | **230** | **49.0%** | **179** | **52.8%** |
| - Perceptions of current major, courses, instruction (high satisfaction or interest) | 288 | 34.3% | 143 | 30.5% | 137 | 40.4% |
| - Appealing career options in current major | 32 | 3.8% | 20 | 4.3% | 7 | 2.1% |
| - Extracurricular or service involvement | 32 | 3.8% | 18 | 3.8% | 12 | 3.5% |
| - Peer or mentor support | 32 | 3.8% | 25 | 5.3% | 6 | 1.8% |
| - Student services (e.g., counseling, orientation) | 21 | 2.5% | 8 | 1.7% | 12 | 3.5% |
| - Other (misc.) | 21 | 2.5% | 16 | 3.4% | 5 | 1.5% |
| **Negative Experience or Influence ("push")** | **240** | **28.6%** | **137** | **29.2%** | **94** | **27.7%** |
| - Academic challenges with prior major (grades, instructors, courses, support services…) | 133 | 15.9% | 74 | 15.8% | 58 | 17.1% |
| - Perceptions of prior major (low satisfaction, poor fit, loss of interest) | 74 | 8.8% | 45 | 9.6% | 23 | 6.8% |
| - Logistical constraints (time to degree; course availability) | 17 | 2.0% | 10 | 2.1% | 6 | 1.8% |
| - Other (misc.) | 16 | 1.9% | 8 | 1.7% | 7 | 2.1% |
| **"None," "No," or "Not Applicable"** | **134** | **16.0%** | **82** | **17.5%** | **48** | **14.2%** |
| **Other (Unspecified or Ambiguous)** | **39** | **4.6%** | **20** | **4.3%** | **18** | **5.3%** |

Total sample N=736; Non-URM sample N=413; URM sample N=297*
* There may be multiple responses per student.
**Percent of responses within each sample, rounded to nearest tenth.

The most frequent responses given by UCLA students suggested high satisfaction with the HASS major to which they switched. Around 50% of all responses indicated that the change in major resulted from a "pull" toward a positive experience with the HASS major rather than a "push" away attributed to a negative aspect of their prior STEM major. About 29% of respondents expressed a negative experience or influence had resulted in the switch of academic major. These responses, indicating a "push" away from a STEM major, often had to do with academic challenges (e.g., low grades, not gaining acceptance into desired major), perceptions tied to instruction and courses (e.g., low satisfaction or poor "fit"), or logistical constraints (e.g., time-to-degree constraints, inadequate course availability). Minor differences surfaced among respondents according to their status ethnic/racial minorities.

Significantly, the reasons for switching from a STEM to HASS major cited by UCLA students overlap with those documented in a groundbreaking three-year, multi-campus study exploring the reasons college students leave the sciences (Seymour and Hewitt 1997). Notably, poor teaching by STEM faculty was cited by over 80% of students in this study as a major factor contributing to their decision to switch majors. Complaints about pedagogy were not made in isolation, as respondents also expressed concerns about advising, assessment (grading) practices, and curriculum design.

### Sample Responses from Students on 2013 and 2014 Senior Surveys

***Good Fit, High Satisfaction or Interest (Current Major Courses, Instruction)***

I took English 4W with a great TA and it made me realize my love for literature and writing. It made me switch majors from psychobiology and completely change my career path. I couldn't be happier now.

The first geography class I took at UCLA was during winter quarter of freshman year, while I was still a science major. I took this class as a GE, but I fell in love with the subject. I had always been interested in different cultures and traveling to different countries, so I figured I finally found something I enjoyed learning about.

Yes, I took an Afro-American Studies course, which discussed Public Health. I was initially an MCD Biology major, but the course helped me to realize that I wanted to learn social sciences, humanities, and sciences in my undergraduate education.

My English Comp 3 class influenced my decision to become an English major. I thoroughly enjoyed the intimate seminar feel of the class and I appreciated how the graduate student teaching the class made herself widely accessible and actually listened to our comments in class. It was nice to know there was a nurturing instructor especially to facilitate my transition to college.

I took Gender Studies 10 as a GE requirement, however, I ended up enjoying the class so much that I decided to change my major. The class was very thought provoking and the discussions we had in section were very critical of existing gender systems and structures of power, [so] I felt compelled to pursue the subject further.

I took Classics 20 as a GE course completely by chance; it was the only GE available based on the schedule I wanted. Initially, I was most excited about taking Chemistry 14A and thought I had no interest in Classics 20 or ancient history... the class absolutely blew my mind. . . . I switched from undeclared life sciences intending to be premed (and a diehard scientist) to being the happiest Classics and French major in the world.

I found the faculty in this major very engaging about the material. Their true passion and desire about their areas of research, along with integrating students and making them feel welcomed and not just 1 in 250 made me love this major.

Yes. I was previously a Mathematics major, but after taking Chicana/o Studies 10A as a GE requirement, the class convinced me to change my major. More than just a major, Chicana/o Studies influenced me at a personal level, as it helped me understand my identity and a person of color.

I was previously a math major and took a philosophy class as an elective and fell in love with the major and the way of thinking.

I took a Mexican Cinema course during the summer that prompted me to continue with the Spanish classes. I realized there was more than literature to the major and found it interesting that it incorporated material that reminded me of how I grew up.

I originally was a math econ major, but enjoyed accounting more than math after taking a class with Professor [name omitted]. He was an amazing, enthusiastic teacher, and really increased my interest in the subject matter.

***Challenges (Grades, Support Services, Competitiveness, Rigor in Previous Major)***

Not being able to complete pre-med requirements. There should be some sort of intervention after the second year if someone has failed their lower divisions pre-reqs. There should be intervention by a counselor to educate the student on other options that will satisfy them in life. I just kept getting dropped from my science majors and then I would enroll in another science major - not right.

Yes. At first, I was psychobiology on the pre-med road. However, a couple of my lower division classes, even explicitly stated by some professors, were aimed at weasling out those who could not keep up with being pre-med. At first, I was disappointed by this. However, I thought this was a blessing in disguise and everything actually worked out.

I was put on academic probation after my second quarter as a transfer at UCLA. I did not have the resources or support as a transfer student and I feel that UCLA's environment is not transfer friendly. I continued to pursue my math degree, but after two years of struggle I finally switched to gender studies. . . . Changing my major has hands down been the most beneficial decision I have made.

I used to be a south campus major and switched to English not only because of the cut-throat people, and lack of community learning, but also the terrible professors in South campus. I have been told a few times how terrible I am and how I am just not smart enough to achieve my goals. However, I am still pre-med because I decided not to let those professors get to me and I am enjoying my life in North campus as well.

Yes, I found myself struggling as a mathematics major and had no support from the department. I was obligated to switch majors even though I really wanted to pursue mathematics. . . . After doing a small research project . . . I realized only 3 African American students have graduated with a mathematics degree within the last 10 years. . . . Although UCLA seeks diversity, I know the institution can do a much better job of supporting its students, especially those from disenfranchised backgrounds.

I originally was planning to major in Biology, but as time went on I realized that it was very difficult for me. Geography was something that combined my love of science but graded me on the basis of writing and comprehension of context as opposed to numbers and details.

My first two quarters at UCLA were horrendous. I didn't try as hard as I should have. Instead of pushing through the adversity, I jumped ship.

Having difficulty in passing my classes in my first major, which was Biology. I also came to understand that if I wanted to be a doctor, it should not be enough to know the science behind the work that I will have to do. As a professional that will be working with people in a more direct way, it is also important to understand humanity and be able to relate and accept others and learn how to treat them on an emotional level.

Yes, the biochemistry prerequisites were so difficult. They scared me off. Looking back now, I probably would have been able to complete the major and been better off as far as finding a job. Oh well, no use crying over spilled milk, as they say.

***Poor Fit, Low Satisfaction or Interest (Previous Major Courses, Instruction)***

I came in as a Pre-med student but didn't like our science professors or classes. I also thought more about being a doctor and eventually decided against that path. Over the summer, at the prompting of my parents, I took Econ 1 and liked it. After that I pursued an economics major.

I was unhappy in the sciences and much preferred academics that challenged my critical thinking and writing skills. I had such a terrible time in the sciences and such a positive experience taking Philosophy 6 that I pursued the major.

Coming into UCLA I had many career aspirations: doctor, dentist, and being a teacher. But after taking lower division chemistry, I found out that science was not the field of study for me. After that, I knew I wanted to major in history.

I reached the upper division classes of the Biology major and did not enjoy the ecology and environmental influences it had.

I came in undeclared life-science, took chemistry 20a, and switched to history. I absolutely hated my professor and it really forced me to change my path. I know the lower division chemistry classes are "weeders," but it was really only hard because the professor did not care about the students in the least and it was blatantly obvious. Not so good for first quarter freshmen.

Yes - the horrible nature of the engineering program. Of course I was never meant to be in that major in the first place, but it doesn't change the fact that the program has been a rather poor experience for not only me but friends and many others.

I hated Engineering, and it was not the right fit for me in terms of the courses, materials, and faculty. I wanted to use Engineering within the field of development, so IDS was perfect for me.

***Career Options (Current Major)***

I switched to anthro to be more flexible in my career choices, since I wasn't sure about what I wanted to do at the time. Since I was taking a lot of science courses, I chose anthro B.S. so it wouldn't be a complete waste if I decided to do something else that did not require the sciences (such as law, or public health).

I initially thought of Sociology as something broad that could be applied towards any future field of interest. As one who plans to enter the medical field, I felt that Sociology would keep me well-rounded and aware of what I experience in society.

I changed my major multiple times - what ultimately made me choose my major was interest coupled with the fact that it got me a job essentially by the end of my sophomore year. Go UCLA Accounting department!

The awful rigidity of the Life Sciences curriculum, which prevent one from taking courses directly related to one's major field until junior year, caused me to switch from Neuroscience to Psychology and English, even though I was getting As in the LS core classes. It would be beneficial to implement more creative/critical thinking classes related to one's specific interests more early on in the LS curriculum.

***Extracurricular or Service Involvement***

The level of activism on campus, especially events that focused on humanitarian aid, made me realize that change is only generated by action and many times you have to be the change you want to see. This pushed me to take some political science classes. . . After that class I realized that political science was the major for me.

When I joined a couple campus organizations and started interacting with different cultural groups, I become more interested in current events and learning more about global health and development. I switched to International Development from Biology in order to learn more about international work in hopes that I can pursue a future in international work.

Yes, my experience . . . . made me realize that my real passion lies with social justice issues rather than the sciences. My experiences as a leader and my immersion in community work has made me reflect on my education, and in turn, I decide to have some sort of relevant education, or something that I enjoy.

***Peer or Mentor Influence***

I came to UCLA with the intention of graduating with a degree in Civil Engineering but I learned that I do not enjoy science as much as I thought I did. I was talking to a friend about my struggles in the major and he suggested I give Economics and Communications a chance. I gave Economics a chance and really liked it.

When I was deciding what major to pursue, I spent most of my time talking to junior and senior students about their experiences in various majors. Also, after talking to my peers about their classes in economics, I decided that economics was something I am interested in.

As a freshman, I had a lot of upperclassmen friends who were in UCLA Econ program. They recommended Econ major because it is not only theoretical but also practical. I never regretted choosing Econ as my major.

***Student Services***

My Freshman orientation largely shaped my choice of major. Discussing course options and career choices with my orientation counselor and fellow incoming students helped me decide upon a major early on in my time at UCLA.

I spoke to [a counselor] who recommended I should look into Anthropology as a major. I had never taken an anthropology course before and was not even sure what anthropology was.

[My counselor] helped me understand the difference between my desires and my parents' desires. When it came time to pick a major that was practical for my time and ability to work, she guided me in a direction I felt was right for me. In the midst of personal struggle, she

allowed me a chance to do something for myself and complete my major just in time for graduation.

***Logistic Concerns***

I was formally a Physiological Sciences major but my counselor told me it was going to take 5 years to complete, and since I am an out of state student I could not afford to stay here for 5 years. So I chose one of the shortest majors, psychology.

Yes. I wanted to be a life sciences major but UCLA often doesn't offer 1st-level Chem or Physics (14A and 6A, respectively) classes during spring quarter, so by freshman year I was already behind in the major. This is stupid and should change. I would have been a life sciences major otherwise.

## Summary of Major Findings

- STEM and HASS faculty reported similar course loads.
- Very few faculty reported having taught an exclusively web-based course at UCLA.
- UCLA faculty engage undergraduates in a variety of scholarly and service activities.
- Opportunities for undergraduates to participate in formal conferences or contribute to publications needs to be expanded.
- Attention to diversity issues in STEM classrooms and among STEM faculty could be improved.
- Most faculty do not feel prepared to handle conflicts surrounding diversity issues in the classroom, indicating there is a need to provide faculty training and tools of practice.
- Most faculty do *not* evaluate prerequisite skills or knowledge, indicating UCLA faculty are making potentially incorrect assumptions about student academic preparedness.
- The majority of UCLA students perceive intense competition for grades despite faculty reporting that they try to dispel perceptions of competition in the classroom.
- Extensive lecturing and grading on a “curve” are commonly utilized by faculty as instructional and assessment modalities campus-wide. By comparison, student-centered practices are relatively under-utilized at UCLA.
- Few faculty agree strongly that there is adequate support for faculty development at UCLA or that faculty are rewarded for being good teachers.
- Most faculty indicated they would be interested in participating in a formal mentoring program, if offered, with respect to teaching.
- Far too few faculty are utilizing OID IIP grants as a resource to support curriculum development and instructional improvement.
- Although faculty largely agree that it is important for UCLA graduate students to serve as Teaching Assistants for at least one term, fewer faculty agree that graduate students in their program receive adequate instruction on becoming good instructors.

- Switching from a STEM to HASS major can result from a "pull" towards positive experiences with HASS coursework rather than a "push" away attributed to negative aspects of a STEM curriculum.
- The frequency and distribution of URM and non-URM student responses were comparable, suggesting the "push" and "pull" influences are similarly experienced by all students.
- Negative experiences that prompt STEM students to switch their major include low grades, poor fit, unfavorable experiences with instructors early in their coursework, and logistical challenges associated with completion of STEM programs.

## References

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives*. New York, NY: Addison Wesley Longman, Inc.

Gasiewski, J. A., Eagan, M. K., Garcia, G. A., Hurtado, S., and Chang, M. J. (2012) From gatekeeping to engagement: a multicontextual, mixed method study of student academic engagement in introductory STEM courses. *Research in Higher Education* 53: 229-261.

Kober, N. (2015). *Reaching students: What research says about effective instruction in undergraduate science and engineering*. Washington, DC: National Academies Press.

Seymour E and Hewitt NM (1997) *Talking About Leaving: Why Undergraduates Leave the Sciences*. Westview Press, Boulder, CO.

Singer, S. R., Nielsen, N. R., & Schweingruber, H. A. (Eds.). (2012). *Discipline-based education research: Understanding and improving learning in undergraduate science and engineering*. Washington, DC: National Academies Press.

Table HA-1
*STEM Fields on the HERI Faculty Survey*

*Agriculture/Natural Resources*
- Agriculture & related sciences
- Natural resources & conservation
- Agriculture/natural resources/related, other

*Biological and Biomedical Sciences*
- Biochemistry/biophysics/molecular biology
- Botany/plant biology
- Genetics
- Microbiological sciences & immunology
- Physiology, pathology & related sciences
- Zoology/animal biology
- Biological & biomedical sciences, other

*Computer/Info Sciences/Support Tech*
- Computer/info tech administration/ management
- Computer programming
- Computer science
- Computer software & media applications
- Computer systems analysis
- Computer systems networking/telecom
- Data entry/microcomputer applications
- Data processing
- Information science/studies
- Computer/info science/support services, other

*Engineering*
- Biomedical/medical engineering
- Chemical engineering
- Civil engineering
- Computer engineering
- Electrical/electronics/comms engineering
- Engineering technologies/technicians
- Environmental/environmental health engineering
- Mechanical engineering
- Engineering, other

*Health Professions*
- Alternative/complementary medicine/sys
- Clinical/medical lab science/allied
- Dental support services/allied
- Dentistry
- Health & medical administrative services
- Allied health & medical assisting services
- Allied health diagnostic, intervention, treatment prof.
- Medicine, including psychiatry
- Nursing
- Optometry
- Osteopathic medicine/osteopathy
- Pharmacy/pharmaceutical sciences/admin
- Podiatric medicine/podiatry
- Public health
- Veterinary medicine
- Health/related clinical services, other

*Mathematics and Statistics*
- Mathematics
- Statistics
- Mathematics & statistics, other

*Physical Sciences*
- Astronomy & astrophysics
- Atmospheric sciences & meteorology
- Chemistry
- Geological & earth sciences/geosciences
- Physics
- Physical sciences, other

*Psychology*
- Clinical psychology