

## **AC 2010-1059: PERCEPTIONS OF K-12 AND COLLEGIATE STEM TEACHING CAREERS BY COMPUTING, ENGINEERING, AND SCIENCE ADMINISTRATORS, FACULTY AND ADVISORS**

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# **Perceptions of K-12 and Collegiate STEM Teaching Careers by Computing, Engineering, and Science Administrators, Faculty and Advisors**

## **Abstract**

With increasing demand for science and math teachers in middle and high schools, educating students who can fill these positions is critical. In many states, the available Colleges of Education are not currently meeting the demand, leaving a role for other institutions with a strong emphasis on science, technology, engineering and math (STEM) to assist with the production of these teachers. Additionally, with a tight job market for STEM faculty positions, there is a need for research universities to facilitate the preparation of their doctoral students for teaching in higher education (especially for those careers in more teaching-oriented colleges and universities).

This paper describes a research study that employs both quantitative and qualitative data collection methods to examine the attitudes of faculty and administrators towards students who pursue teaching-oriented careers. One-on-one interviews conducted with deans of the Colleges of Computing, Engineering, and Sciences, and focus groups with associate deans, school chairs, graduate coordinators, and undergraduate coordinators from those three colleges provided an opportunity to discuss the role of a technological institute in preparing both undergraduate and graduate students in STEM fields for teaching oriented careers. The interviews and focus groups also provided an opportunity for an in-depth discussion of traditional career paths and the perceived institutional barriers and institutional support for students' interest in teaching careers. Additionally, surveys were used to elicit beliefs of 1) academic advisors of undergraduate students and 2) faculty in the three Colleges who supervise doctoral students concerning the prestige of teaching careers, the characteristics of students pursuing teaching careers, and their perceived level of preparation for advising students about teaching careers.

The results indicate that interest in teaching careers is perceived to be increasing among both graduate and undergraduate students in STEM fields, and that faculty and academic advisors do not feel well prepared for advising students about these kinds of careers. There is also agreement among all constituencies that additional institutional support is needed for both graduate and undergraduate students who are interested in teaching careers. Faculty and administrators have different student characteristics in mind when describing doctoral students who are interested in a teaching-oriented career; however, there is greater agreement between administrators and advisors concerning the characteristics of undergraduates interested in teaching STEM content in middle and high school. Among all participants, there is agreement on the institution's commitment to providing STEM content and the need for more clearly delineated pathways to teaching careers, but there is also agreement that responsibility for K-12 teaching certification should reside within Colleges of Education. Both the current demand for STEM teachers and the need for a better prepared professoriate require that more institutions begin to think about how they can facilitate student pursuit of STEM teaching careers, even those with no previous experience with teacher preparation. This paper highlights several key issues facing technological institutions as they confront their potential role in providing STEM educators for the state and region.

## **Background**

In 2009, Georgia Institute of Technology, a STEM intensive public university, received an NSF Innovation through Institutional Integration (I<sup>3</sup>) grant to fund its *Tech to Teaching* proposal that had two goals:

1. To create an infrastructure on the campus that encourages and enables students to effectively pursue careers in K-12 or college teaching; and
2. To develop and implement programming that ensures these students succeed in their initial years in these career paths.

One component of the assessment plan for this project was to track the “culture” on campus as it pertains to teaching careers – that is to gain an understanding of the perceptions of the faculty, advisors, and administrators of career paths that are centered around education; and to investigate how this perception changes over the life of the project. Therefore, in winter 2009, the project assessment team undertook a baseline study of these perceptions. This paper describes this process and the initial findings.

## **Methodology**

### Participants

Participants in the interviews and focus groups represented the college administration of the Colleges of Computing, Engineering, and Sciences. Participants included the deans of each of the three Colleges; seven associate deans; 12 school chairs; seven graduate coordinators; and eight undergraduate coordinators.

A total of 728 faculty members across the Colleges of Computing, Engineering, and Sciences received an invitation to complete the survey. Faculty members were eligible to participate if they were either tenured, eligible for tenure, or professors of the practice. All respondents completed questions concerning gender, college affiliation, tenure status, and the number of doctoral advisees they had supervised over the previous three years. Faculty members indicating they had not supervised any doctoral advisees over the past three years were thanked for their participation after completing the demographic section, and did not answer any of the subsequent questions. Of the 728 survey recipients, 415 completed the demographic section only, while 384 completed the entire survey, for a response rate of 52.7 percent.

Table 1 presents the demographic characteristics of the graduate survey sample. The respondents who completed the survey were representative of the population who received an invitation to participate in the survey according to gender, college, and academic rank.

Table 1. Faculty respondent demographics

|                     | College             |                        |                     |
|---------------------|---------------------|------------------------|---------------------|
|                     | Computing<br>(n=40) | Engineering<br>(n=235) | Sciences<br>(n=135) |
| Assistant Professor | 20.0                | 21.7                   | 34.1                |
| Associate Professor | 30.0                | 23.8                   | 18.5                |
| Professor           | 30.0                | 42.1                   | 37.0                |
| Other*              | 20.0                | 12.3                   | 10.4                |

\*includes deans, chairs, and senior academic administrators

All members of the institutional advising network (undergraduate advisors) received an invitation to complete a survey addressing their perceptions of STEM teaching careers in middle and high school for undergraduate students. Of the 83 academic advisors receiving an invitation to complete the survey, 54 advisors opted to participate, for a response rate of 65.1 percent. Table 2 presents the proportion of the 54 advisors affiliated with each college.

Table 2. Distribution of advisors by college

| Architecture | College   |             |            |            |          |        |
|--------------|-----------|-------------|------------|------------|----------|--------|
|              | Computing | Engineering | Ivan Allen | Management | Sciences | Other* |
| 3.7          | 3.7       | 33.3        | 24.1       | 3.7        | 22.2     | 9.3    |

\*includes staff unaffiliated with a college

### Interviews and focus groups

The series of interviews and focus groups was designed to probe the opinions and feelings of faculty and administrators in the Colleges of Computing, Engineering, and Sciences about the role a technical institute should assume in preparing STEM students for teaching careers in middle schools, high schools, or post-secondary institutions where the primary focus would be on undergraduate education. The discussions revolved around three main topics: 1) perceptions of careers chosen by undergraduate and graduate students in the colleges, 2) internal and external resources available for students who want to learn about teaching careers, and 3) the Institute’s role in producing STEM teachers

Individual interviews were conducted with the three deans, while separate focus groups were conducted with associate deans, school chairs, undergraduate coordinators, and graduate coordinators of the three Colleges. The interviews occurred in the deans’ offices, while the focus groups were conducted in a conference room. Interviews and focus groups each lasted approximately one hour. The interviews and focus groups were audio recorded and then transcribed for analysis.

### Surveys

Faculty advise doctoral students while undergraduate advisors provide academic advising for undergraduates. In order to better understand how doctoral and undergraduate advisors view the institution’s role in preparing STEM doctoral students for academic careers in teaching-centered,

undergraduate-oriented colleges and middle and secondary schools, two parallel surveys were developed to address four main topics:

- Perceptions of the characteristics of STEM faculty positions at institutions where the focus is primarily on undergraduate education (or faculty positions in middle and secondary schools)
- Perceptions of the characteristics of doctoral students (or undergraduate students) who are interested in pursuing such a career
- Perceptions of the prestige level of various career paths for doctoral students (or undergraduate students)
- Perceptions of the faculty members' (or advisors') degree of preparation for advising doctoral students (or undergraduate students) about a variety of career paths

Faculty members and undergraduate advisors who completed the survey also responded to four open-ended questions addressing the institution's strengths and weaknesses in preparing students for STEM teaching careers, and what internal and external resources are currently available for students who are interested in pursuing a STEM teaching career. Participants also had the opportunity to share any additional thoughts they had on the institution's role in preparing either undergraduate or graduate students to pursue teaching-oriented academic careers. Faculty who advise doctoral students answered an additional question concerning whether they would encourage a doctoral student to pursue a faculty position at an institution where the primary focus is on undergraduate education. The surveys were administered using Survey Monkey, with a completion window of approximately two months. Each survey took approximately 15 minutes to complete.

## **Results**

### Graduate Students

Focus group and interview participants reported that among doctoral students interested in pursuing an academic career, while most are interested in research-extensive institutions, the perception was that increasing numbers are interested in more teaching-oriented careers. Among focus group participants, explanations for interest in this kind of academic career ranged from students being uninterested in or incapable of the research intensity required for tenure and promotion at a research-extensive institution, to students being attracted to this kind of career based on their own educational background or because of their experiences in the classroom.

When asked about the perceived motivations of students pursuing such an academic career, doctoral advisors were significantly more likely to agree that these students *want significant interaction with students* (4.17), *want to teach a subject they love* (4.03), and *want to mentor undergraduate students in research* (3.78), than they were to agree that these students *tend to be less productive researchers compared to other doctoral students* (3.15), *have constraints on location* (3.13), or *want to enjoy the perceived benefits such as summers off or more time with family* (3.35). Table 3 presents the average ratings for perceived motivations for teaching undergraduates ratings, across all respondents.

Table 3. Perceived motivations for an undergraduate teaching career

| [1: strongly disagree; 3: neutral; 5: strongly agree ]   | Average Rating |
|--|----------------|
| <b>Do you believe that doctoral students who want to work at institutions where the primary focus is on undergraduate education typically:</b> |                |
| want significant interaction with students   | 4.17           |
| want to teach a subject they love to get undergraduates excited by it  | 4.03           |
| learn appropriate content knowledge  | 3.92           |
| had a professor who really inspired them as an undergraduate   | 3.89           |
| want to mentor undergraduate students in research  | 3.78           |
| want to introduce undergraduates to STEM fields  | 3.68           |
| make the decision to focus on teaching while enrolled as graduate students   | 3.33           |
| want to enjoy the perceived practical benefits such as summers off and more time with family   | 3.35           |
| tend to be less productive researchers compared to other doctoral students   | 3.15           |
| have constraints on location or relocation   | 3.13           |

Disaggregating the data revealed that female faculty members were significantly more likely to agree that *perceived benefits* were a factor in this choice (4.11) than were male faculty members (3.72). Additionally, doctoral advisors who had earned tenure were significantly more likely than were their tenure-track colleagues to agree that desire for *significant interaction with undergraduates* (4.22 vs. 4.00) and *getting undergraduates excited by a subject they love* (4.07 vs. 3.88) are factors in choosing this career path.

Faculty advising doctoral students generally believed that academic careers at institutions where the emphasis is on undergraduate education would be *equally suitable for men and women* (4.61), be *hard work* (4.21), and *require creativity* (4.06). Faculty members were least likely to agree that such a job *would provide good portability* or *pay well*. Table 4 presents the average ratings for each job characteristic across all respondents.

Table 4. Perceived characteristics of an undergraduate teaching career

| [1: strongly disagree; 3: neutral; 5: strongly agree]  | Average Rating |
|--|----------------|
| <b>Suppose one of your doctoral students was offered a faculty position at an institution where the primary focus is on undergraduate education. Do you agree that this job would:</b> |                |
| be equally suitable for men and women  | 4.61           |
| be hard work   | 4.21           |
| require creativity   | 4.06           |
| be interesting   | 3.93           |
| require a broad breadth of expert knowledge  | 3.79           |
| provide an opportunity to engage in a variety of fields  | 3.53           |
| require high levels of expert knowledge  | 3.44           |
| be prestigious   | 3.04           |
| provide good job portability   | 2.95           |

While there was general agreement that a job in an institution that emphasizes undergraduate education would be *equally suitable for men and women* and *require hard work and creativity*, agreement levels were significantly lower for respondents in the College of Engineering than for respondents in the College of Sciences (gender suitability, hard work, creativity) and the College of Computing (creativity). [See Table 5]

Table 5. Position characteristics by college

[ 1: strongly disagree; 3: neutral; 5: strongly agree ]

|  | College               |                          |                       | sig level |
|--|-----------------------|--------------------------|-----------------------|-----------|
|  | Computing<br>(n = 38) | Engineering<br>(n = 223) | Sciences<br>(n = 122) |           |
| <b>Suppose one of your doctoral students was offered a faculty position at an institution where the primary focus is on undergraduate education. Do you agree that this job would:</b> |                       |                          |                       |           |
| be equally suitable for men and women  | 4.74                  | 4.49                     | 4.77                  | **        |
| be hard work   | 4.31                  | 4.03                     | 4.48                  | ***       |
| require creativity   | 4.31                  | 3.90                     | 4.28                  | ***       |
| require a broad breadth of expert knowledge  | 4.14                  | 3.61                     | 3.99                  | ***       |
| be interesting   | 4.03                  | 3.85                     | 4.06                  |           |
| provide an opportunity to engage in a variety of fields  | 3.57                  | 3.40                     | 3.75                  | **        |
| require high levels of expert knowledge  | 3.34                  | 3.34                     | 3.64                  | *         |
| provide good job portability   | 3.06                  | 2.83                     | 3.12                  | *         |
| be prestigious   | 2.89                  | 2.98                     | 3.21                  | *         |
| be well paid   | 2.40                  | 2.67                     | 2.63                  |           |

\* p<.05, \*\* p<.01, \*\*\* p<.001

In focus groups and interviews, there was discussion among participants about an institutional culture which values, rewards, and seeks to produce researchers at research-extensive institutions while there is less encouragement for more teaching-oriented academic careers. This sense of differential career prestige was echoed by faculty who advise doctoral students, as they rated academic careers at doctoral/research institutions (4.47) as significantly more prestigious than all other career options. Similarly, careers at two-year institutions were rated as significantly less prestigious (2.24) than all other career options, while academic careers at baccalaureate institutions surpassed only two-year colleges in career prestige (3.07).

Table 6. Career-path prestige for Ph.D. graduates

[1: far below average prestige; 3: average prestige; 5: far above average prestige]

|  | Average Rating |
|--|----------------|
| <b>What is your rating of career prestige for a doctoral student who chooses a(n):</b> |                |
| academic career at a doctoral/research institution                                     | 4.46           |
| academic career at a Master's college/university                                       | 3.40           |
| post-doctoral position   | 3.39           |
| industry career  | 3.34           |
| government career  | 3.21           |
| academic career at a baccalaureate college   | 3.07           |

Even though the prestige level of an academic career at baccalaureate institutions was low relative to more research-intensive academic careers, faculty reported that they were inclined to encourage such a career when they believed the student’s career interest lay in that direction.

While faculty generally felt prepared to advise doctoral students about various career paths, they felt most prepared to advise students about *research-extensive* academic careers (4.66) and least prepared to advise students about academic careers at *two-year institutions* (3.00). Faculty felt equally prepared to advise students about *baccalaureate* careers (3.68) and *government* careers (3.49).

**Table 7. Career advising confidence**

| [1: completely unprepared; 3: somewhat prepared; 5 very well prepared]     |  | Average Rating |
|--|--|----------------|
| <b>How well prepared do you feel for advising doctoral students about:</b> |  |                |
| academic careers at doctoral/research institutions                         |  | 4.66           |
| post-doctoral positions  |  | 4.54           |
| academic careers at master’s colleges/universities                         |  | 4.06           |
| industry careers   |  | 3.73           |
| academic careers at baccalaureate colleges                                 |  | 3.68           |
| government careers   |  | 3.49           |
| academic careers at 2-year colleges  |  | 3.00           |

It should be noted, however, that the number of doctoral advisees supervised and the kind of careers that students in a particular discipline were likely to pursue affected doctoral advisors’ feelings regarding preparation for advising their doctoral students about various career options. All respondents indicated that they were best prepared for advising students about doctoral/research careers and least prepared for advising students about careers in two-year institutions. Respondents who had supervised between one and three doctoral students felt significantly less prepared than all other respondents to advise students about industry careers, and significantly less prepared to advise students about government and research/doctoral careers than did respondents who had advised at least ten doctoral students. Respondents who had supervised between four and six doctoral advisees also felt less prepared to advise students about industry than did their colleagues who had supervised ten or more doctoral advisees. Respondents who had supervised fewer than seven doctoral advisees rated their preparation to advise students about careers in baccalaureate institutions more highly (4<sup>th</sup>) than did their colleagues with seven or more advisees over the past three years(6<sup>th</sup>).

**Table 8. Career advising confidence by number of doctoral advisees supervised**

| 1: completely unprepared; 3: prepared; 5: very well prepared               | Doctoral Advisees |               |                |                | sig level |
|--|-------------------|---------------|----------------|----------------|-----------|
|  | 10+<br>(n=50)     | 7-9<br>(n=58) | 4-6<br>(n=130) | 1-3<br>(n=146) |           |
| <b>How well prepared do you feel for advising doctoral students about:</b> |                   |               |                |                |           |



|  |      |      |      |      |     |
|--|------|------|------|------|-----|
| academic careers at doctoral/research institutions | 4.82 | 4.7  | 4.72 | 4.55 | **  |
| post-doctoral positions                            | 4.57 | 4.6  | 4.57 | 4.47 |     |
| industry careers                                   | 4.41 | 3.89 | 3.78 | 3.39 | *** |
| academic careers at master's colleges/universities | 4.24 | 3.96 | 4.11 | 3.98 |     |
| government careers                                 | 3.9  | 3.6  | 3.49 | 3.31 | **  |
| academic careers at baccalaureate colleges         | 3.78 | 3.58 | 3.78 | 3.59 |     |
| academic careers at 2-year colleges                | 3.08 | 2.84 | 3.09 | 2.95 |     |

\* p<.05, \*\* p<.01, \*\*\* p<.001

### Undergraduate Students

The sense among focus group and interview participants was that the majority of undergraduates intend to pursue careers in industry or attend graduate/professional school. A lack of either a College of Education or STEM-related education majors may influence students interested in pursuing a career as a STEM teacher in middle or high schools to self-select out of applying for admission. Additionally, factors such as the perceptions of low pay, difficult working conditions, and public school bureaucracy are seen as deterrents to students' interest in pursuing a middle or high school teaching career. While undergraduates don't usually enroll with an intention of becoming a teacher, an undergraduate teaching assistantship, or involvement with programs or coursework related to teaching and learning that allow undergraduates to interact with K–12 teachers, and external programs such as Teach for America often enhance students' interest in teaching careers during their college years.

The focus group participants indicated that faculty members are largely supportive of undergraduate students who are interested in pursuing a teaching career. The consensus was that students who are interested in this kind of career can find support through existing resources such as the Center for the Enhancement of Teaching and Learning (CETL) and the Student and Teacher Enhancement Partnership (STEP – an NSF supported GK-12 project). There was concern, however, that additional resources are necessary if the institution is going to facilitate students' entry into these careers. While it was agreed that the institution has a role to play in producing STEM teachers, there was consensus among participants that the institutional focus should remain on providing STEM content while designing new pathways or highlighting existing pathways to certification programs at other colleges and universities for interested students.

Advisors generally agreed that a career as a middle or high school teacher in the STEM fields would be *equally suitable for men and women* (4.90), and *be important to society* (4.84), however advisors in the Colleges of Engineering and Sciences were significantly more likely to agree that *such work is important for society* (5.00 each) and *equally suitable for men and women* (5.00 each) than were advisors in liberal arts (4.92 and 4.67 respectively) or business (4.60 and 4.60 respectively). Advisors also agreed that teaching middle school or high school math or science would be *interesting work* (4.24) that *requires hard work* (4.53) and *creativity* (4.53). There was overall agreement that careers in K–12 education do not pay well (2.49). Table 8 presents the average rating for each job characteristics across all advisors.

Table 8. Characteristics of a middle school and high school teaching career.

| [1: strongly disagree; 3: neutral; 5: strongly agree]  | Average Rating |
|--|----------------|
| <b>If an undergraduate student at [institution] wanted to become a middle or high school math or science teacher, do you believe that the job would:</b> |                |
| Be equally suitable for men and women  | 4.90           |
| Be important to society  | 4.84           |
| Be hard work   | 4.53           |
| Require creativity   | 4.53           |
| Be interesting   | 4.24           |
| Provide good job portability   | 3.84           |
| Offer an opportunity to engage in a variety of fields  | 3.76           |
| Require high levels of expert knowledge  | 3.73           |
| Be prestigious   | 3.08           |
| Be well-paid   | 2.49           |

The advisors agreed that undergraduates who are interested in K–12 teaching careers are significantly more influenced by a desire to *put students on the path to success* (4.18), *teach a subject they love* (4.08), and *having had a teacher who really inspired them as a student* (4.14), than by being *average or below-average students compared to their peers* (2.27) or *wanting to enjoy the perceived benefits such as summers off and more time with family* (3.45).

Table 9. Perceived motivation for a K-12 STEM teaching career

| [1: strongly disagree; 3: neutral; 5: strongly agree]  | Average Rating |
|--|----------------|
| <b>Do you believe that [institution] undergraduates who become middle or high school math or science teachers typically:</b> |                |
| Like the idea of putting kids on the path to success   | 4.18           |
| Learn appropriate content knowledge at Georgia Tech  | 4.14           |
| Had a teacher who really inspired them as a student  | 4.14           |
| Want to teach a subject they love to get students excited about it   | 4.08           |
| Want the portability of the profession   | 3.48           |
| Want to enjoy the perceived benefits such as summers off and more time with family   | 3.45           |
| Wanted to be a teacher when they enrolled at Georgia Tech  | 2.39           |
| Tend to be average or below-average students compared to other Georgia Tech undergraduate students                           | 2.27           |

Among advisors, *medical doctor* had significantly higher career prestige ratings (4.47) than all other career options, while *real estate agent/broker* had significantly lower career prestige ratings than all other career options. The career prestige levels of *middle school* (2.82) and *high school teachers* were significantly higher than only *real estate broker/agent*, although *high school teachers* had significantly greater career prestige ratings than did *middle school teachers*. Advisors generally felt similarly and adequately prepared for advising students about careers in research (3.22) and industry (3.04), while they felt significantly less prepared to advise students about K-12 teaching careers (2.82) than the did about research careers. While the differences were not statistically significant, advisors in the College of Sciences feel more prepared to advise students

about K–12 teaching careers (3.17) than did their colleagues in engineering (2.73), liberal arts (2.58) and management (2.80).

Table 10. Career-path prestige for BS graduates

| [1: far below average prestige; 3: average prestige; 5: far above average prestige]              |  | Average Rating |
|--|--|----------------|
| <b>What is your rating of career prestige for an undergraduate who chooses a career as a/an:</b> |  |                |
| Doctor   |  | 4.47           |
| College professor  |  | 4.12           |
| Scientist  |  | 4.12           |
| Engineer   |  | 4.04           |
| Architect  |  | 3.84           |
| Business executive   |  | 3.73           |
| Lawyer   |  | 3.71           |
| Military officer   |  | 3.35           |
| Banker   |  | 3.27           |
| Accountant   |  | 3.10           |
| Nurse  |  | 3.08           |
| Stockbroker  |  | 3.00           |
| High School teacher  |  | 2.92           |
| Middle-School teacher  |  | 2.82           |
| Real estate agent/broker   |  | 2.51           |

While advisors felt only adequately prepared to advise students about teaching careers in middle and high school, they are aware of resources that can serve that purpose such as CETL, the STEP program, and the pre-teaching advisor.

### Conclusions

While not many students have shown interest in pursuing either K–12 or undergraduate teaching careers in the past, there was consensus that interest in such careers appears to be increasing among both undergraduate and doctoral students. For both undergraduates and doctoral students who are interested in teaching-oriented careers (either K–12 or collegiate), there was agreement that the institution provides appropriate content knowledge, that such a career is equally suitable for men and women, and that such a career will be interesting and hard work, require creativity, and will not be well paid.

Among both focus group and interview participants, there were two dominant explanations for why doctoral students choose an academic career at an institution where the primary focus is on undergraduate education. For some doctoral students, the motivation seems to be a lack of interest in or capability for the research intensity required for tenure and promotion at a research-intensive institution, while for others, such an interest seems arise from their own educational backgrounds or because of their experiences in the classroom. While faculty who were surveyed didn't indicate that research ability was a factor in doctoral students' decision to choose this kind of academic career, they did agree that these students want significant interaction with undergraduate students and they want to teach a subject that they love and get students excited by it.

Across all focus groups and interviews, there was agreement that the institution has a role to play in helping produce STEM teachers at both the K–12 and collegiate level, although there is also the belief the institution should not change its fundamental emphasis away from STEM research. Both undergraduate and doctoral students who are interested in pursuing careers where the focus is on teaching STEM content should be provided with pathways that allow more easy access to these careers. Additionally, graduate faculty and undergraduate advisors did not feel well prepared to advise students about baccalaureate or middle and high school STEM teaching careers.

## Doctoral Faculty Advisor Survey

**Suppose one of your doctoral students was offered a faculty position at an institution where the primary focus is on undergraduate education. Do you agree that this job would:**

[Rating scale: 1: strongly disagree, 3: neutral; 5: strongly agree]

- Be equally suitable for men and women
- Be hard work
- Be interesting
- Provide an opportunity to engage in a variety of fields
- Be prestigious
- Be well-paid
- Provide good job portability
- Require high levels of expert knowledge
- Require a broad breadth of expert knowledge
- Require creativity

**Do you believe that [institution] doctoral students who want to work at institutions where the primary focus is on undergraduate education typically:**

[Rating scale: 1: strongly agree; 3: neutral; 5: strongly agree]

- Want to teach a subject they love to get undergraduates excited by it
- Learn appropriate content knowledge
- Want to introduce undergraduates to STEM fields
- Want to mentor undergraduate students in research
- Had a professor who really inspired them as an undergraduate
- Want to enjoy the perceived practical benefits such as summers off and more time with family
- Want significant interaction with students
- Tend to be less productive researchers compared to other doctoral students
- Have constraints on location or relocation
- Make the decision to focus on teaching while enrolled as graduate students

**What is your rating of career prestige for a [institution] doctoral student who choose a(n):**

[Rating scale: 1: far below average prestige; 3: average prestige; 5: far above average prestige]

- Industry career
- Government career
- Academic career at a doctoral/research institution
- Academic career at a Master's college/university
- Academic career at a baccalaureate college
- Academic career at a 2-year college
- Post-doctoral position

**How well prepared do you feel for advising [institution] doctoral students about:**

[Rating scale: 1: completely unprepared; 3: somewhat prepared; 5: very well prepared]

- Industry careers
- Government careers
- Academic careers at doctoral/research institutions
- Academic careers at master's colleges/universities
- Academic careers at baccalaureate colleges
- Academic careers at 2-year colleges
- Post-doctoral positions

## Undergraduate Advisors Survey

**If an undergraduate student at [institution] wanted to become a middle or high school math or science teacher, do you believe that the job would:**

[Rating scale: 1: strongly disagree, 3: neutral; 5: strongly agree]

- Be important to society
- Be equally suitable for men and women
- Be hard work
- Be interesting
- Offer an opportunity to engage in a variety of fields
- Be prestigious
- Be well-paid
- Provide good job portability
- Require high levels of expert knowledge
- Require creativity

**Do you believe that [institution] undergraduates who become middle or high school math or science teachers typically:**

[Rating scale: 1: strongly disagree, 3: neutral; 5: strongly agree]

- Want to teach a subject they love to get students excited about it
- Learn appropriate content knowledge
- Like the idea of putting kids on the path to success
- Had a teacher who really inspired them as a student
- Want to enjoy the perceived benefits such as summers off and more time with family
- Want the portability of the profession
- Tend to be average or below-average students compared to other undergraduate students
- Wanted to be a teacher when they enrolled

**What is your rating of career prestige for a [institution] undergraduate who chooses a career as a/an:**

[Rating scale: 1: far below average prestige; 3: average prestige; 5: far above average prestige]

- Accountant
- Architect
- Banker
- Business executive
- College professor
- Doctor
- Engineer
- High School teacher
- Lawyer
- Middle-School teacher
- Military officer
- Nurse
- Real estate agent/broker
- Scientist
- Stockbroker

**How well prepared do you feel for advising undergraduate students about:**

[Rating scale: 1: completely unprepared; 3: somewhat prepared; 5: very well prepared]

Industry careers  
Research Careers  
K-12 teaching careers

