First-year Class Instills Confidence in Nontechnical Skills for Collegiate Success

Anna Levina[1], Katy Guthrie[1], Leah Cook[1], and Marvin Pritts[1]

Keywords. cultural humility, communication skills, first-year experience, interview skills, resume, stress management, study habits, undergraduate student

Abstract. **Universities are encouraging academic units to offer introductory courses that include content to help new students adapt and adjust to college life, deal with stress, and plan for future careers. Few studies have identified the level of confidence that students have in these skills when they matriculate or after completing such courses. For 3 years, first-year plant science majors were surveyed at the beginning and end of their first semester at Cornell to determine whether a class focused on improving skills for success (PLSCI 1101: Pathways to Success in Plant Sciences) resulted in enhanced confidence. Skills and practices deemed important for success and targeted in class included study habits, constructing a resume, interviewing effectively, developing cultural humility, discovering one's identity, managing mental health, approaching faculty, exploring graduate school, and learning about plant science careers. Assessing these skills with standard fact-based testing methods is not effective, so we assessed change in confidence during the semester, allowing students to self-assess their own learning. We also were able to examine differences in responses based on gender and matriculation status (freshmen admits vs. transfers) and found that differences were minor across years. The course was most effective at enhancing confidence in knowing about graduate school, learning about faculty interests, writing a resume, and learning about career options. Students entering the class already had a high level of confidence in their ability to manage stress, interview well, talk with faculty, ask questions in class, and study. However, confidence always improved by every measure from the beginning to the end of the semester, and many of these changes were statistically significant. This class succeeded in building confidence in specific skills and practices necessary for a successful college career and future employment.**

University study has traditionally focused on the technical domain of knowledge, emphasizing competence in subject-matter content comprehension. As a result, personal and social domains of learning, during which students learn more about themselves and how they interact with others, have been underemphasized (Barr and Tagg 1995). Although undergraduate education has long been shifting away from traditional content instruction to more applied learning models (Barr and Tagg 1995; Tytler 2020), instructor-centric, lecture-style educational practices that emphasize discipline content delivery still largely persist in science, technology, engineering, and math education (Stains et al. 2018). Within plant science education, a competency model of education has recently been proposed that has its roots in self-awareness and personal development, and emphasizes transferable skills as tools that can be used to uncover new knowledge (Hubbard 2024). This model also proposes competencies in self-awareness and personal development.

These educational shifts are, in part, driven by employers, who report that personal qualities and broad transferable skills are ranked higher than academic knowledge when evaluating potential job candidates (Andelt et al. 1997; McGunagle and Zizka 2020). Of these, the ability to listen actively, communicate clearly, and be self-aware of individual strengths and weaknesses have consistently been among the most important skills for which employers look (Andelt et al. 1997; Kitto et al. 1996; Madewell et al. 2003). Additional prioritized skills include the ability to work effectively on a team, make informed judgments and decisions, and apply knowledge to real-world situations (Hart Research Associates 2015). Often, these skills are not the primary focus of major-specific courses in undergraduate education, but instead are developed in tandem with content delivery (VanderZanden and Reinert 2009).

The development of social and personal skills is important within the university context. For example, knowing how to study, manage stress, when to ask for help, and how to develop relationships with faculty are important nontechnical skills to acquire early in students' academic careers to promote long-term student success (Barr and Tagg 1995). As they progress through their undergraduate degree, important nontechnical skill development may also include developing cultural humility, participating effectively in teamwork, and navigating postgraduation careers. We believe that the earlier interpersonal skills are taught, the more confidence individuals will have in using these skills in novel situations, including job interviews, internships, and their first position postgraduation.

At Cornell University, all freshmen and transfer undergraduate plant science students are required to take PLSCI 1110: Pathways to Success in Plant Sciences during their first semester at the university. This course was developed with the intention of 1) creating a cohort of students that forms bonds among themselves and 2) emphasizing the development of nontechnical skills critical for academic success. This includes introducing students to university resources, connecting with faculty, and fostering the personal skills necessary for success in the plant sciences program and beyond. Course learning outcomes include 1) describing the vast career opportunities across the agricultural and plant sciences disciplines, including the work being done by various faculty on campus; 2) articulating individual goals and action steps for academic, extracurricular, and career planning; and 3) demonstrating academic and professional skills for successful degree completion and job acquisition or graduate school admission. Course objectives include 1) create an intellectual community among plant sciences students; 2) assist in

Received for publication 31 Oct 2024. Accepted for publication 31 Dec 2024.

Published online 7 Feb 2025.

[1]Horticulture Section, School of Integrative Plant Science, 236 Tower Road, Cornell University, Ithaca, NY, 14886, USA

M.P. is the corresponding author. E-mail: mpp3@cornell.edu.

https://doi.org/10.21273/HORTTECH05565-24

Table 1. Topics included in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University for first-year students to acquire skills and improve success at the university.

What science tells us about study habits
Facilities visits
Resume construction and critique
Interview skills and practice
Cultural humility
Discovering your identity
Diversity in a global world
Mental health awareness
Engaging in research
Strategies for approaching faculty members
Collaborative service projects
What is graduate school?
Careers in industry
Careers in education
Careers in academia

transition from high school to university, or another college/university to this university; 3) offer opportunities for social unity and identity among students and with a cross-section of faculty, staff, and alumni in an effort to establish supportive and cooperative relationships; 4) foster exploration into personal identity in the context of career exploration; and 5) introduce the breadth of activities and resources available to achieve a balance between academic, extracurricular, and interpersonal activities.

To evaluate learning gains, we measured changes in self-evaluation of confidence in selected personal and social skill areas based on a pre- and postcourse survey. Self-confidence has long been identified as an influential motivator of individual behavior (Bandura 1986, 1997), and is foundational for skill development and mastery. Analyzing the difference in confidence scores is an approach that has been used previously to evaluate program (Ahuja et al. 2023; Rivera et al. 2023; Thang et al. 2023) and course effectiveness, including a study that leveraged students' self-confidence scores to evaluate content mastery in an introductory horticulture course (Shoemaker 2010). Our study explores the impacts of dedicated course instruction on student's self-confidence in specific, interpersonal skill areas, providing valuable insights into students' perceptions of their own interpersonal skill development.

Table 2. Demographic data for survey of first-year students in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University.[i]

	Gender		Matriculation	
Year	Male	Female	Freshmen	Transfers
2020	16	14	16	15
2021	14	18	22	10
2022	18	20	18	9

[i]In Fall 2020 and Fall 2022, one student listed "other" for gender, and, because of the low response number, those data were not included for effect of gender analysis.

Table 3. Baseline levels of confidence for all enrolled students in PLSCI 1101 (Pathways to Success in Plant Sciences) at Cornell University at the beginning of the semester for each of 3 years that pre-/postsurveys were administered.

Confidence indicator	2020	2021	2022	Mean
Talking to faculty	68.0	74.0	61.7	67.9
Giving an elevator pitch	66.4	76.4	59.2	67.3
Asking for help	64.7	72.0	62.2	66.3
Handling stress	NA	64.4	60.1	62.3
Studying for exams	63.3	60.9	58.4	60.9
Asking questions in class	63.6	65.6	49.6	59.6
Faculty research	64.1	55.3	49.9	56.4
Writing a resume	60.6	52.9	44.7	52.7
Interview skills	54.7	55.0	42.8	50.8
Career options	51.1	50.7	44.5	48.7
Quality of resume	48.3	48.2	43.6	46.7
Knowledge of graduate school	27.7	22.3	22.3	24.1
Mean	57.5	58.1	49.9	55.2

NA = not applicable.

Methods

PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University is offered in the fall semester once a week and consists of various activities, presentations, exercises, service projects, and laboratory tours aimed at developing skills for later success (Table 1). For three consecutive years, a confidence survey was administered during the first week of the fall semester and again at the end of the semester to evaluate self-perception of skills acquired during the course. During Fall 2020, the course was run in a hybrid modality, and for Fall 2021 and 2022, the course was in-person only (Table 2).

Student confidence in the acquisition of various skills was measured on a continuous scale from 0 to 100, where 0 points represented no confidence and 100 points represented complete confidence in the following metrics: asking for help, understanding career options, giving an elevator pitch, learning about graduate school, interviewing for jobs, asking questions in class, learning about the faculty, approaching faculty, studying for exams, writing a resume, and managing stress. Survey questions were slightly modified after the Fall 2020 semester and remained the same in subsequent years. The survey was anonymous, so individual pre- and post-test responses were not tracked. Student scores were viewed and evaluated by an educational researcher external to the course instruction team. Student data on high school performance, class rank, or grade point average were not collected.

In addition to the confidence scores of the students, we collected demographic data on gender and matriculation status. Because of the structure of the major, the class contains both freshmen and transfer students. To capture the effect of a student transferring into the program, we aggregated internal (students transferring between majors at Cornell) and external (students transferring from another school into Cornell) transfers regardless of graduation year. Thus, two additional effects evaluated were gender (male vs. female) and class year (freshman vs. transfer). The number of students not declaring a gender was too small to measure the effects. We chose to keep each analysis separate between years because teaching modalities changed during the pandemic.

The surveys were generated in Qualtrics (Provo, UT, USA) and shared with the students via Canvas (Instructure, Salt Lake City, UT, USA). The survey was assigned to students as part of a ungraded, outside class assignment. Survey results were compiled and incomplete surveys were removed. The

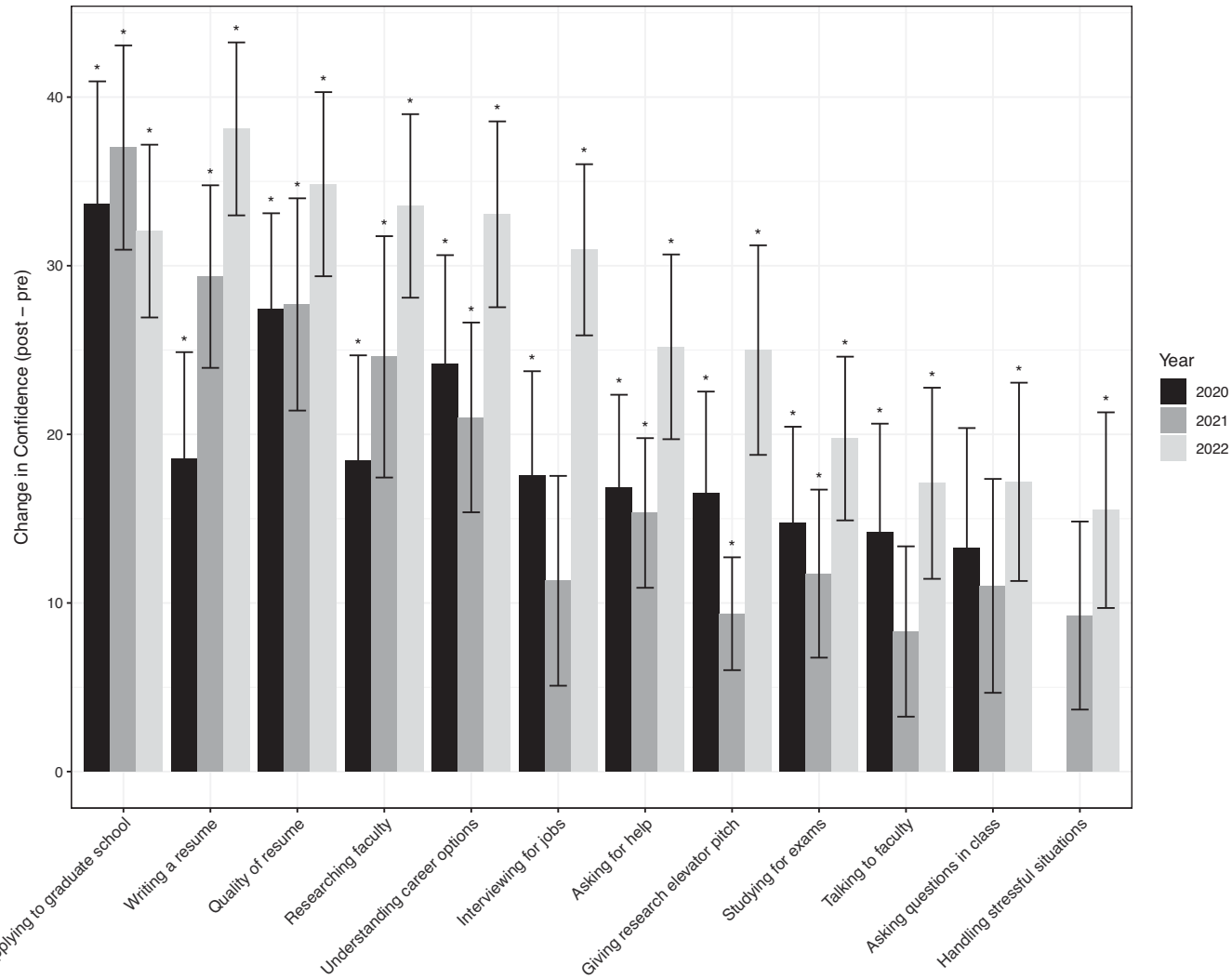

Fig. 1. Change in confidence for various indicators of success between entering plant science students and those who completed PLSCI 1101 (Pathways to Success in Plant Sciences) at Cornell University for each of 3 years. Table 4 reports the significance levels of the survey data by year.

data were analyzed using RStudio ver. 2022.12.0, posit (Boston, MA, USA) in consultation with the Cornell University Statistical Consulting Unit. The data were analyzed with linear models with time (beginning/end), gender, and transfers as factors. Interactions between the factors were also examined. The data were corrected for multiple testing corrections, and residuals and assumptions for the linear models were checked. The data

Table 4. Improvements in confidence on various indicators after completing PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University.[i]

Measured trait	2020	2021	2022
Writing a resume	X	X	X
Quality of resume	X	X	X
Career options	X	X	X
Faculty research	X	X	X
Interview skills	X	NS	X
Knowledge of graduate school	X	X	X
Giving an elevator pitch	X	X	X
Asking for help	X	X	X
Studying for exams	X	X	X
Handling stress	X	NS	X
Asking questions in class	NS	NS	X
Talking to faculty	X	NS	X

[i] Data are combined across gender and matriculation status.
NS = not significant; X = significant improvement in confidence from the beginning of the course to the end (at $P < 0.05$).

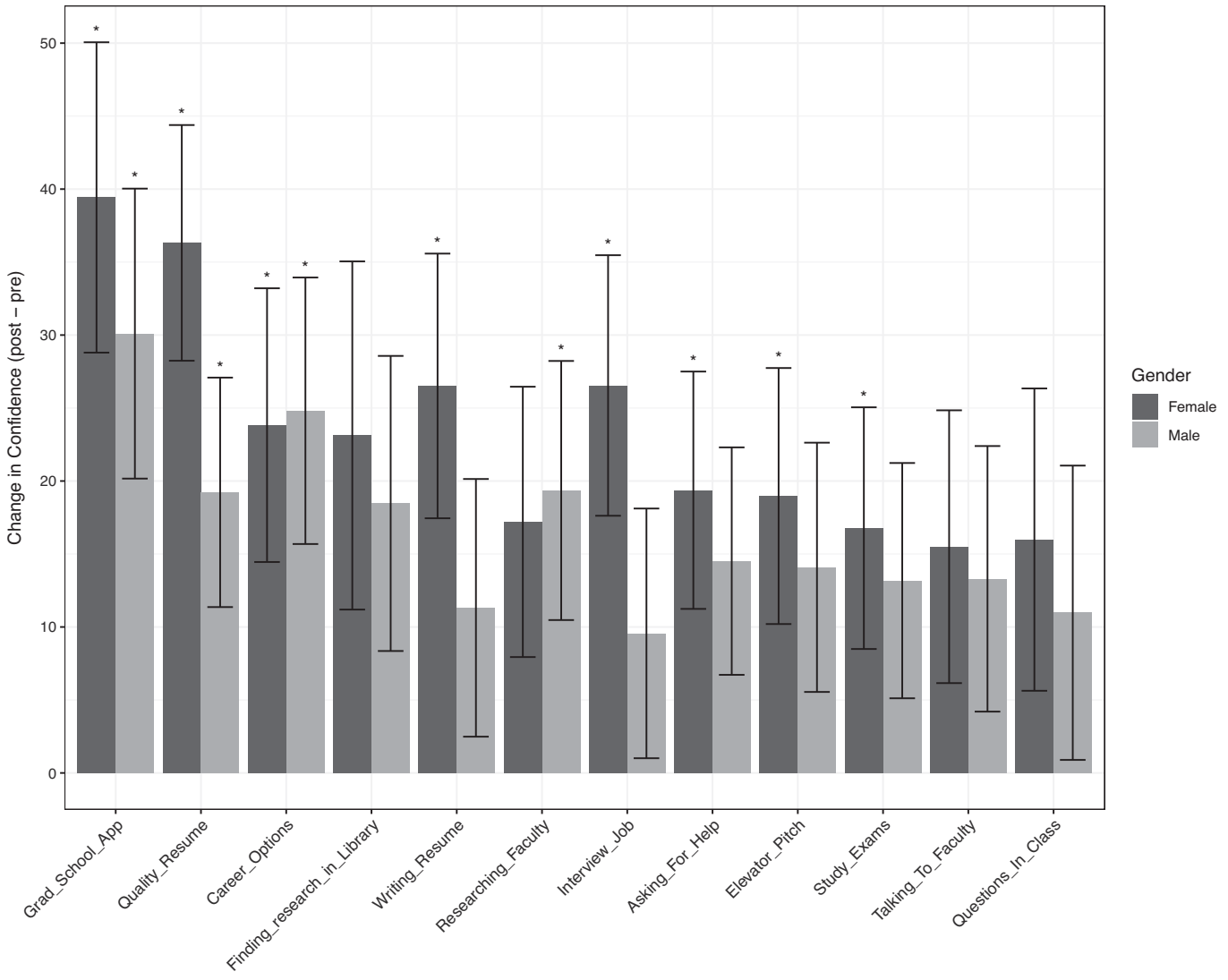

Fig. 2. Difference in change of confidence between female (black) and male (gray) students of Fall 2020 in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University. The *x*-axis corresponds to skills that were addressed during the class and the asterisk indicates which of the skills had a difference in confidence significantly greater than zero at $P < 0.05$. Bars represent the standard error.

were visualized using the ggplot function. The function emmeans was used to check for differences within groups, such as gender and transfers vs. freshmen.

Results

Students entered Cornell with various levels of confidence in attributes we aimed to improve (Table 3). Entering students were least knowledgeable and confident about graduate school, their resume, career opportunities, and interview skills. However, the average student felt very confident about interpersonal dialog with faculty, staff, and peers. Talking with faculty, giving an elevator speech, and asking for help ranked highest among all confidence indicators at the beginning of the semester. They also had high confidence in their ability to handle stress and to study effectively for exams.

There was less opportunity for improvement for indicators in which students already had a high degree of confidence, but regardless, by the end of the semester, students showed a positive change in confidence in each variable across the 3 years, and many of these changes were statistically significant (Table 4, $P < 0.05$). Improvements in confidence varied somewhat by year and there were slight differences between genders in some years.

Fall 2020. Students reported a positive change in confidence for each variable measured in Fall 2020. The largest increase in confidence was 33.7 units for learning about graduate school and the smallest increase was in confidence to ask questions in class (13.3 units), although this increase was not significantly different ($P > 0.05$) from the beginning to the end of the semester (Fig. 1, Table 4).

When confidence differences were evaluated by gender (Fig. 2), the largest increase in confidence was in learning about graduate school for both males and females (30.1 and 39.4 units, respectively). The lowest confidence gain for males was in the category interviewing for a job (9.6 units); for females, it was talking to faculty (15.5 units) (Fig. 2). Among the transfer students, the largest increase in confidence was also seen in learning about graduate

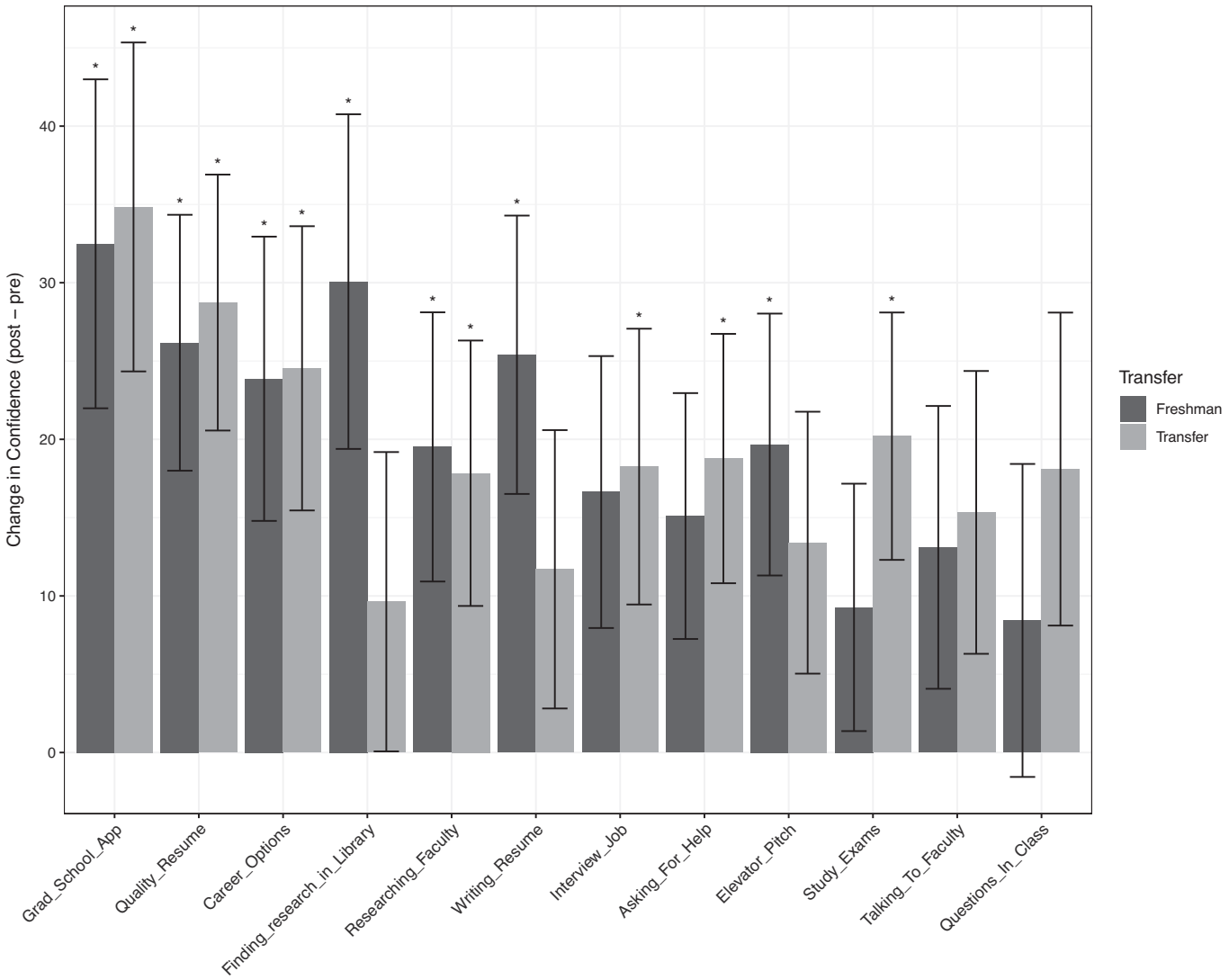

Fig. 3. Difference in change of confidence between transfer (gray) and freshman (black) students in Fall 2020 in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University. The *x*-axis corresponds to skills that were addressed during the class and an asterisk indicates which of the skills had a difference in confidence significantly greater than zero at $P < 0.05$. Bars represent the standard error.

school, with a gain of 34.8 units, and the lowest confidence gains were made in writing a resume, with a change of 9.6 units (Fig. 3). Among the freshman students, the change in confidence ranged from 32.5 units for learning about graduate school to 9.3 units in studying for exams. On most measures of confidence, freshmen and transfer students were similar. The biggest differences were in library skills and resume writing; freshmen gained more confidence than transfers because transfers likely entered with a greater level of confidence in these indicators.

Fall 2021. The mean change in confidence ranged from a high of 37.0 units for learning about graduate school to a low of 8.3 units for talking to faculty. Activities that had a statistically significant positive change in confidence were learning about graduate school, writing a resume, the quality of the resume, researching faculty, understanding career options, and asking for help (Fig. 1). Although there were differences in changes in confidence between male and females, none of the differences were significant except for interview skills and handling stress. Males indicated a significant increase in confidence whereas females showed almost no increase (Fig. 4).

The range for change in confidence for males ranged from 43.7 units for learning about graduate school to 10.4 units for giving an elevator pitch. For females, the change in confidence ranged from 31.2 units for learning about graduate school to 0.2 units for dealing with stress (Fig. 4). There were also no statistically significant differences between transfers and freshmen (Fig. 5). The change in confidence for transfers ranged from 40.1 units for learning about graduate school to 3.1 units for interviewing for a job. For freshmen, the change in confidence ranged from 35.4 units for learning about graduate school to 6.4 units for giving an elevator pitch.

Fall 2022. Fall 2022 showed the greatest increase in collective student confidence of the 3 years of the survey. Except for learning about graduate school, the 2022 indicators were always

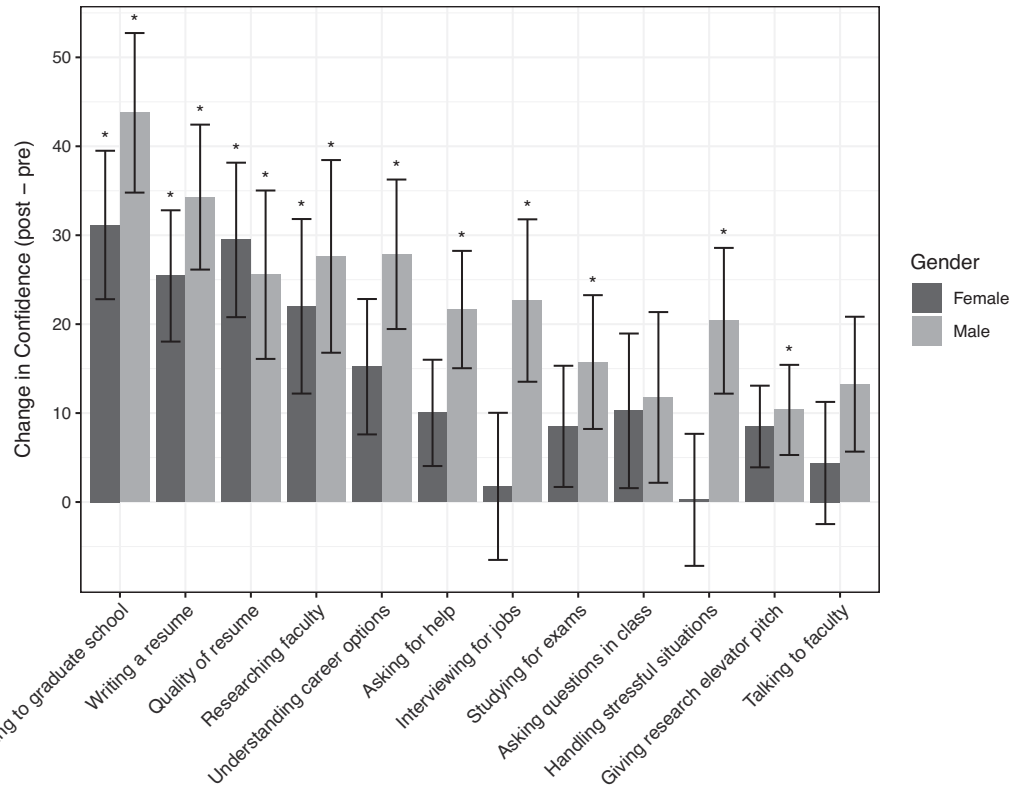

Fig. 4. Difference in change of confidence between male (gray) and female (black) students in Fall 2021 in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University. The *x*-axis corresponds to skills that were addressed during the class and the asterisk indicates which of the skills had a difference in confidence significantly different from zero at $P < 0.05$. Bars represent the standard error.

highest. It is possible that instructors improved their teaching approach over time. However, this class also entered with the lowest overall confidence of the three, so there was more opportunity to enhance confidence from the baseline. The overall change in confidence ranged from 38.1 units for writing a resume to 15.5 units for dealing with stress. Activities that had a statistically significant positive change in confidence were writing a resume, the quality of the resume, researching faculty, interviewing for jobs, understanding career options, and learning about graduate school (Fig. 1).

Although there were differences in the change of confidence between males and females, the differences were not statistically significant, except for researching what faculty do; females gained more than males. The change in confidence ranged from 44.2 units for researching faculty for females to 20.7 units for dealing with stress for females. For males, the change in confidence ranged from 34.9 units for learning about graduate school to 9.7 units for dealing with stress (Fig. 6). There was no statistical difference between freshmen and transfers for any indicator in 2022. The range for change in confidence for transfers was 41.3 units for writing a resume to 16.0 units for asking questions in class. For freshmen, the change in confidence was from 35.7 units for researching faculty to 10.3 units for dealing with stress (Fig. 7).

Discussion

Overall, we found that teaching students certain skills always resulted in improved confidence over the semester and, most of the time, these differences were significantly different from the beginning of the semester to the end. Every demographic group seemed to benefit from directed activities aimed at improving skills and confidence.

Among the skills addressed in class, the biggest changes in overall confidence during the 3 years were in learning about applying for graduate school, writing a resume, the quality of the resume, and learning what faculty do. Most freshmen are just adapting to college and are not thinking about what comes after graduation, so it is not surprising that few know anything about graduate school. However, choices made as early as freshman year can impact admission into graduate school, as ~60% of Cornell plant sciences majors go on for advanced studies (personal observation). Similarly, freshmen view faculty mostly in a teaching role and are not aware of the significant impact research and extension efforts play in the life of a professor. Many students are surprised to learn about the various roles that faculty have at the university. Furthermore, freshmen are not generally aware that becoming involved in research as an undergraduate can impact acceptability into graduate school, so learning about graduate school and the role of faculty are related indicators.

Resume construction and quality were other variables that saw marked improvement in confidence during the course of a semester. Freshmen entering college generally do not need a resume, but most internships and summer jobs expect one. This is a timely skill for freshmen to develop, so it is not surprising that they are engaged in learning to write a good

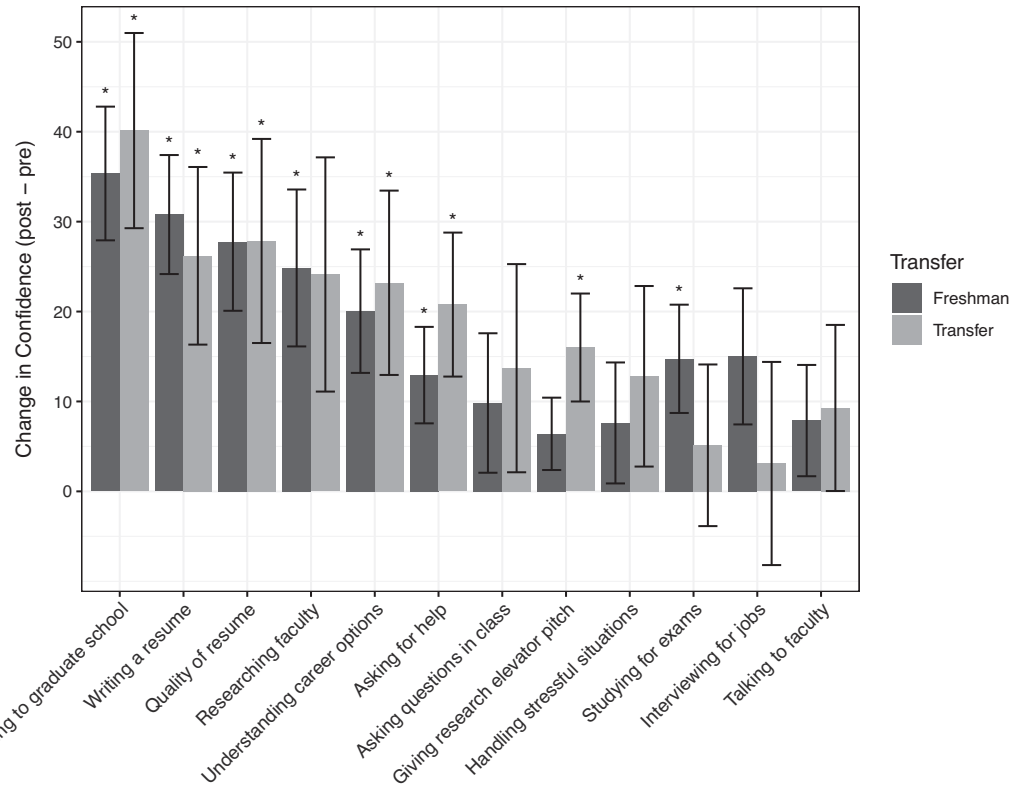

Fig. 5. Difference in change of confidence between transfer (gray) and freshman (black) students in Fall 2021 in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University. The *x*-axis corresponds to skills that were addressed during the class and an asterisk indicates which of the skills had a difference in confidence significantly different from zero at $P < 0.05$. Bars represent the standard error.

resume. In PLSCI 1110, students received additional benefits by completing the draft of their resume in class, and they received feedback from peers and instructors.

Understanding career options also ranked high. Our perception is that freshmen are unaware of the wide range of career options for graduates with a degree in horticulture or plant science. Exposing students to panels of practitioners and alumni improved their confidence that they could find a rewarding career with their degree. This trend is not unique to plant sciences. Most students benefit from early career guidance in a supportive environment.

Universities have implemented many programs to reduce student stress. These often include instructor training, workshops, seminars, extra days of vacation, and increased counseling. Somewhat surprisingly, incoming students ranked their confidence in dealing with stress relatively high, so that improvement was relatively low across all 3 years, including 2020, when COVID was rampant on campuses. The survey was administered at the beginning of the semester, before students experienced exams and stress, and thus showed high confidence in stress management. It is possible that prior interventions as part of residential life training at the university already improved student resilience so that attention to stress reduction in PLSCI 1110 (nature hikes, collaborative food preparation, learning study skills, mental health awareness) had little additional impact.

Students did not find the class helpful in improving confidence with regard to approaching and talking with faculty, asking for help, and studying for exams. This may be surprising to instructors, because most feel that students are reticent about approaching them for help and often have poor study habits (Brown et al. 2014). It is possible that faculty and the institutions for which they work are now providing more venues for communication. With today's communication tools, a student does not have to attend office hours or make an appointment to communicate with their instructors. Also, students entering Cornell already have a high level of confidence in their study and communication skills, and may believe they can handle stress well, so there is less room for improvement compared with other indicators. It would be interesting to survey seniors to determine whether their perception about their study and stress management skills evolved over 4 years and what they would have found helpful that we did not include in the course.

A few differences were observed between male and female responses across years. A notable example was interview skills. Female gain was significant in 2020 and was greater than male gain. However, in 2021, the opposite occurred, with female gain not significantly different from zero. In 2022, gender differences were not observed. In another case, females in 2021 gained little from the class with regard to how to handle stress, whereas in 2022, females gained significantly. (This indicator was not measured in 2020 during the height of the pandemic.) The reason for these

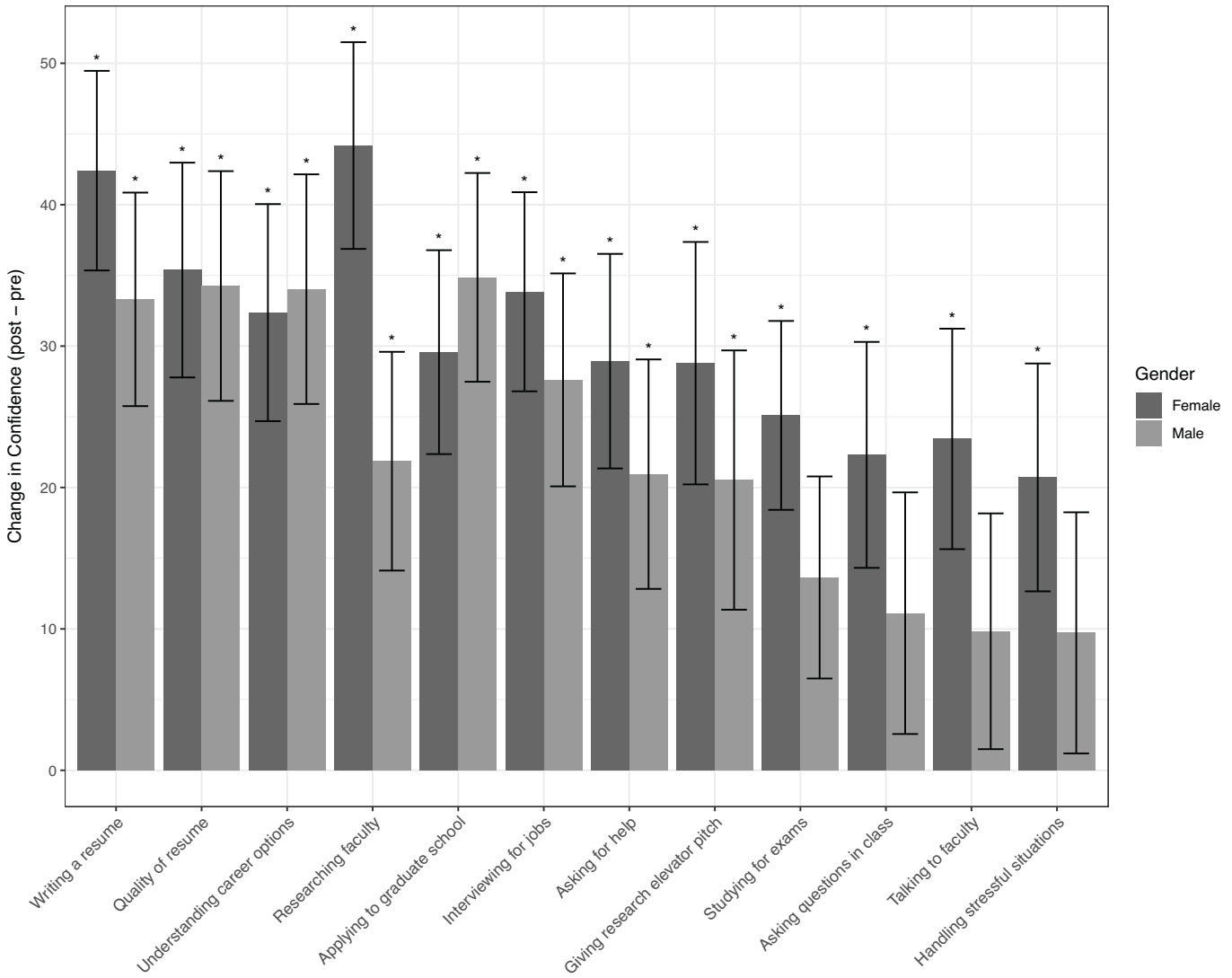

Fig. 6. Difference in change of confidence between female (black) and male (gray) among the students of Fall 2022 in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University. The *x*-axis corresponds to skills that were addressed during the class, and the asterisk indicates which of the skills had a difference in confidence significantly greater than zero at $P < 0.05$. Bars represent the standard error.

inconsistencies between genders across years is not clear.

Freshmen and transfer students did not differ significantly for any variable in any of the 3 years of the study, suggesting that the needs of these two groups are similar despite transfers having at least 1 year more of college experience elsewhere. It is likely that these transfer students did not have a class like PLSCI 1101, so this subject matter was new to them as well.

The first semester at college is challenging so it is helpful to provide students with a course that focuses on success. We have demonstrated that such a course improves self-perception of confidence by many measures. There are other benefits of such a course that were not addressed by this study. One example is the building of a cohort, which typically does not occur in a traditional lecture course focused on subject matter acquisition. Such cohorts facilitate team building and mental health support. At Cornell, all majors in the College of Agriculture and Life Science have now been asked to develop a similar course for first-year students based, in part, on the documented success of PLSCI 1110.

Conclusion

To summarize, our survey suggests that matriculating students know little about the role of faculty within the university or what steps are needed to prepare for graduate school. This is not surprising, because incoming students only have perceptions from their high school experience or perhaps 1 year at a community college. Learning about the role of faculty, graduate school, various career options, and writing a quality resume are class activities that impacted students the most. Incoming students reported high levels of confidence in talking with faculty, asking questions in class, and managing stress, so they reported little gain from attention to these topics in class. Even though students arrive on campus with confidence in their abilities, we believe from experience that this early confidence is often unfounded, and most will benefit

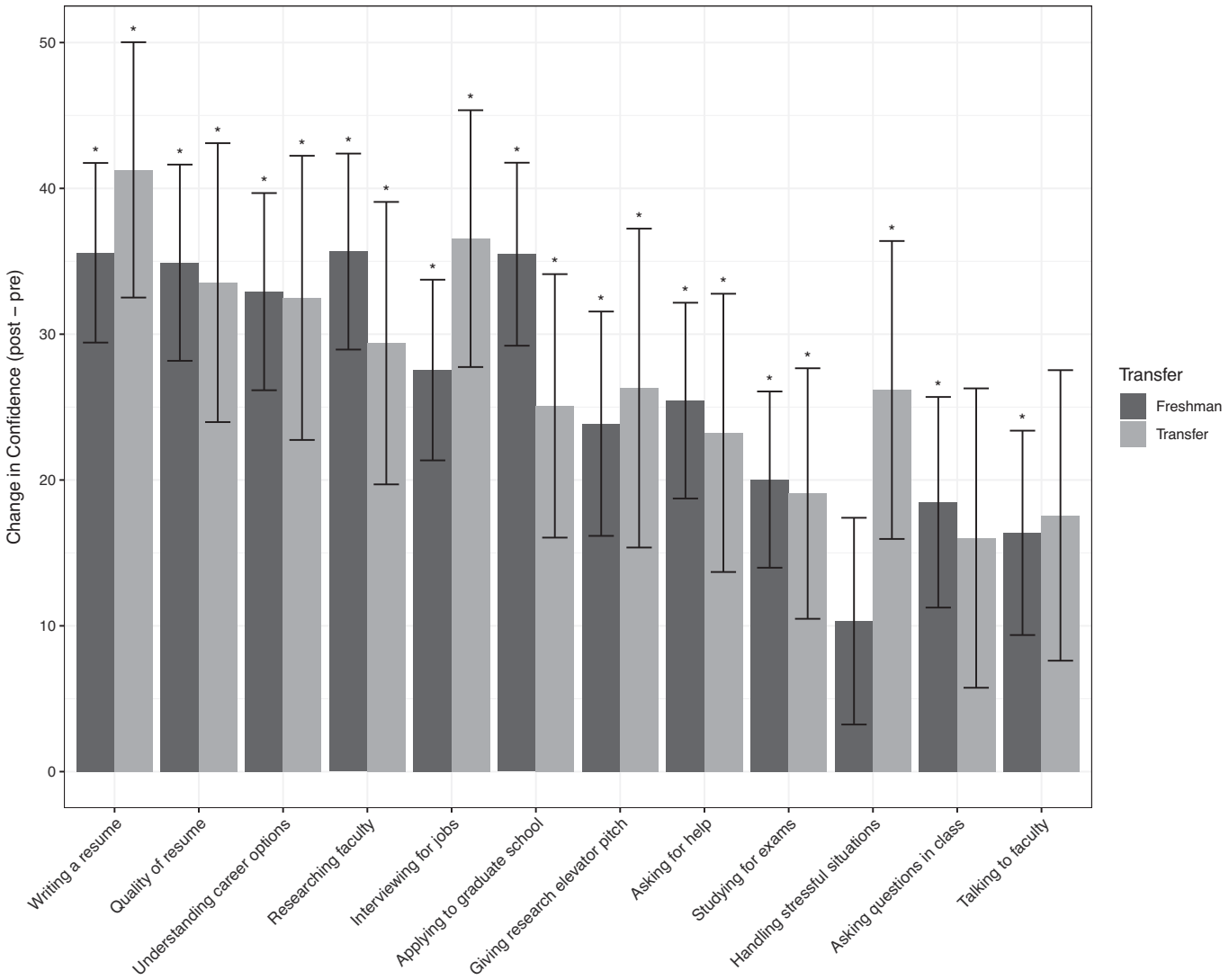

Fig. 7. Difference in change of confidence between transfer (gray) and freshman (black) students in Fall 2022 in PLSCI 1110 (Pathways to Success in Plant Sciences) at Cornell University. The *x*-axis corresponds to skills that were addressed during the class and the asterisk indicates which of the skills had a difference in confidence significantly different from zero at $P < 0.05$. Bars represent the standard error.

from directed attention to these skills for success. In fact, improvement was measured in all indicators over each of the 3 years of the survey.

References cited

Ahuja TK, John JT, Olvet DM, Crilly C, Petrizzo MC, Weiner JS, Pawelczak M. 2023. Teaching second-year medical students how to counsel pediatric patients with unhealthy body mass index. Child Obes. 19(5):357–361. https://doi.org/10.1089/chi.2022.0068.

Andelt L, Leverne B, Bosshamer B. 1997. Employer assessment of the skill preparation of students from the College of Agricultural Science and Natural Resources at the University of Nebraska-Lincoln: Implications for teaching and curriculum. North Amer College Teachers J. 41:47–53.

Bandura A. 1986. Social foundations of thought and action: A social cognitive theory. Prentice-Hall, Englewood Cliffs, NJ, USA.

Bandura A. 1997. Self-efficacy: The exercise of control. W. H. Freeman, New York, NY, USA.

Barr RB, Tagg J. 1995. From teaching to learning: A new paradigm for undergraduate education. Change. 27(6):12–26. https://doi.org/10.1080/00091383.1995.10544672.

Brown PC, Roediger HL, McDaniel MA. 2014. Make it stick: The science of successful learning. Harvard Press, Cambridge, MA, USA.

Hart Research Associates. 2015. Falling short? College learning and career success. Hart Research Associates, Washington, DC, USA.

Hubbard K. 2024. Plant biology education: A competency-based vision for the future. Plants People Planet 6(4):780–790. https://doi.org/10.1002/ppp3.10503.

Kitto S, Smith W, Sims J, Morehart A, Vasilas B, Pesek J. 1996. Evaluation of the curriculum of a department of plant and soil sciences. North Amer College Teachers J. 40:24–31.

Madewell T, Savin M, Brye K. 2003. Alumni and employer perceptions of crop, soil and environmental sciences curricula: Survey results. J Nat Res Life Sci Educ. 32(1):100–106. https://doi.org/10.2134/jnrlse.2003.0100.

McGunagle D, Zizka L. 2020. Employability skills for 21st-century STEM students: The employers' perspective. HESWBL. 10(3):591–606. https://doi.org/10.1108/HESWBL-10-2019-0148.

Rivera N, Nguyen K, Kalami V, Qin F, Mathur MB, Blankenburg R, Yeh AM. 2023. A specific carbohydrate diet virtual teaching kitchen curriculum promotes knowledge and confidence in caregivers of pediatric patients with inflammatory bowel disease. Nutrients. 15(18):3999. https://doi.org/10.3390/nu15183999.

Shoemaker CA. 2010. Student confidence as a measure of learning in an undergraduate principles of horticultural science course. HortTechnology. 20(4):683–688. https://doi.org/10.21273/HORTTECH.20.4.683.

Stains M, Harshman J, Barker MK, Chasteen SV, Cole R, DeChenne-Peters SE, Eagan MK, Esson JM, Knight JK, Laski FA, Levis-Fitzgerald M, Lee CJ, Lo SM, McDonnell L, McKay TA, Michelotti N, Musgrove A, Palmer MS, Plank KM, Rodela TM, Sanders ER, Schimpf NG, Schulte PM, Smith MK, Stetzer M, Van Valkenburgh B, Vinson E, Weir LK, Wendel PJ, Wheeler LB, Young AM. 2018. Anatomy of STEM teaching in North American universities. Science. 359(6383):1468–1470. https://doi.org/10.1126/science.aap8892.

Thang CK, Guerrero AD, Garell CL, Leader JK, Lee E, Ziehl K, Carpenter CL, Boyce S, Slusser W. 2023. Impact of a teaching kitchen curriculum for health professional trainees in nutrition knowledge, confidence, and skills to advance obesity prevention and management in clinical practice. Nutrients. 15(19):4240.

Tytler R. 2020. STEM education in the twenty-first century, p 21–44. In: Anderson J, Li Y (eds). Integrated approaches to STEM education. Springer, Cham, Switzerland. https://doi.org/10.1007/978-3-030-52229-2.

VanDerZanden AM, Reinert M. 2009. Employer attitudes and perceptions of job preparedness of recent Iowa State University horticulture graduates. HortTechnology. 19(3):647–652. https://doi.org/10.21273/HORTSCI.19.3.647.