Sowing the Seeds:

Preparing Students in Research
Computing Departments for Teaching-Focused Careers

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Executive Summary

Teaching-focused positions in computing departments continue to grow in usage and availability, particularly as the growth of computing programs continues to exceed the growth in teaching capacity provided by research-and-teaching faculty hiring. While these have become increasingly common career paths chosen by students, departments generally don't provide adequate training for the particular skills expected in these careers. Investing in training students for teaching can provide additional benefits to students and their departments in terms of instructional quality, instructional capacity, and career outcomes. This white paper discusses the lack of training for PhD students pursuing teaching-focused careers and provides suggestions for channeling interest in teaching, training students in teaching, and preparing them for the teaching-focused job market. While these recommendations are aimed at better preparing PhD students for teaching-focused careers, many of the proposed approaches also strengthen instructional quality, mentoring capacity, and teaching support for faculty and other instructors more broadly.

Suggestions to better prepare PhD students for teaching-focused careers include:

- Attracting and supporting students by building or supporting existing communities of interest around teaching. This includes making students more aware of the variety of teaching careers and the breadth of job expectations beyond teaching.

- Creating opportunities that support TAs who seek job responsibilities beyond those of typical TA assignments. Additional responsibilities should allow a TA to gain relevant leadership, pedagogical, and logistical experiences.

- Creating more instructor of record opportunities for students, either within their own department or with partner schools and organizations, to provide the most directly applicable experience.

- Making mentoring and guidance in teaching available to the motivated TAs and student instructors of record, and rewarding the individuals who offer these mentorship activities.

- Offering professional development opportunities outside of teaching roles, including specific preparation for the CS teaching-focused job market and CS-specific coursework on pedagogy and course development.

Terminology

Terminology that we will use that may vary across institutions:

- **Computing departments** – Used for brevity to encompass computer science and informatics units that use any of the names department, school, faculty, or college.

- **R1 institutions** – U.S. research universities classified by the Carnegie Classification of Institutions of Higher Education as having *very high research activity*. We use this term to distinguish large, research-intensive universities from other post-secondary institutions with different teaching and research expectations.

- **Teaching faculty** – Faculty whose job expectations focus more on teaching than research. We include faculty that may have more evenly split responsibilities (e.g., professors at primarily undergraduate institutions). We believe this term reflects the titles typically used by computing departments.

- **Research-and-teaching (R&T) faculty** – Faculty whose job expectations focus more on research than teaching (but do include teaching). We omit research-only faculty while acknowledging that some R&T faculty have reduced teaching obligations, and some research-only faculty do teach. We will not use the term "tenure-track faculty," since not all R&T faculty are tenure-track (and some teaching faculty are tenure-track).

- **Post-secondary teaching-focused positions** – Teaching faculty and non-faculty instructor roles at colleges and universities, where the majority of job expectations center around teaching activities.

- **Scholarship** – A catch-all for non-teaching and non-service responsibilities expected of teaching faculty. It may include, but is not limited to, research, scholarship of teaching

and learning, public engagement, K-12 outreach/support, advising, providing professional development to other faculty, and educational leadership.

- **Student Instructor** – A student who is in the role of an instructor of record (i.e., responsible for course design and delivery as a sole instructor or co-instructor) rather than as a teaching assistant.

We acknowledge that the terms related to faculty are not perfect and may potentially reinforce distinctions that are unnecessary or even counterproductive; however, we believe that these terms accurately reflect the current state of most research-intensive computing departments.

Scope

This white paper provides guidance to administrators of computing departments at research-intensive universities on how they can prepare students for post-secondary teaching-focused positions, typically as a long-term career. We focus our discussion on teaching-focused positions in North American institutions and preparing PhD students, though most of the suggestions will also benefit undergraduate and master's students who may go on to pursue teaching-focused careers. This paper is intended to complement previous white papers on teaching faculty hiring and engaging teaching faculty, by aggregating various institutional efforts and providing suggestions for departments looking to better support their graduate students who are seeking teaching-focused careers, as well as students who expect teaching to be a component of their future careers (e.g., as R&T faculty).

As noted in the previous white papers, these efforts are currently complicated by the variety of types of teaching-focused positions, variation of teaching contexts (e.g., large vs. small or online vs. in-person), and mismatches in hiring practices and expectations. We recognize that nothing comes for free and that there are likely structural, administrative, and other barriers that may prove challenging to overcome when implementing these suggestions; however, we believe that there are still meaningful steps that can be taken.

Motivation

The hiring of teaching faculty in computing departments continues to surge, with the 2024 CRA Taulbee Survey suggesting that this trend will continue with a 12 percent expected two-year growth in teaching-focused positions (Teaching Professors and Other Instructors). Along with the growth of available positions, the number of students pursuing these types of positions has also increased, making it an increasingly common career path. CRA-E runs a Career

[Landscape Workshop](#) about teaching-focused careers, which has seen increased interest and participation, including nearly doubling its participants from 2024 to 2025.

For hires who are new to teaching-focused positions ("New PhD," "Recent Postdoc," and "Came from Industry" in the CRA Taulbee Survey, accounting for 57% of new teaching-focused hires in 2023-24), many find themselves underqualified or ill-prepared for the array of job responsibilities, which requires significant professional development, mentoring, and learning on the job that can be especially time-consuming and stressful in the first one to two years.

Teaching faculty recruiting has long faced a lack of trained candidates, as standard computing graduate programs provide little training, if any, on how to teach — master's programs focus on depth in subject matter expertise, and PhD programs focus on research skills. Graduate students who seek teaching-focused positions often find themselves unprepared, even after maximizing the teaching-related opportunities within their program. This often manifests in a lack of teaching experience, especially as an instructor of record, and limited access to mentoring, leading to slower development of teaching skills and weaker outcomes in the job market. Some institutions have recognized this challenge and are creating more professional development opportunities to support students pursuing this career path, as covered by the following sections of recommendations.

Outside of those seeking teaching-focused positions, investing in training students in teaching can provide additional benefits to departments and their students. Having better-trained course staff (e.g., TAs) improves the educational quality and can improve program outcomes and student interest in advanced opportunities (e.g., undergraduate research). Student Instructor opportunities increase instructional capacity to better handle program growth or free up faculty to teach more specialized courses. For PhD students on the academic job market, teaching ability can be a differentiating factor for candidates with comparable research records. For PhD students who are unsure about pursuing an academic career, interest in teaching may sway them as more teaching-focused opportunities are presented to them (e.g., professorship at a primarily undergraduate institution). Effort spent on training students in teaching should improve outcomes for all, ideally attracting and retaining more students in computing and producing better outcomes for the graduate students and faculty of tomorrow.

This white paper was additionally motivated and guided by information gathered from interviews and informal conversations with members of hiring committees for teaching faculty, recently-hired teaching faculty, and current graduate students at research-intensive universities interested in teaching. The interviews were part of a separate study whose formal analysis will not be presented here; we mention them due to their role in sparking conversations and gathering ideas and examples. From the interviews and informal conversations, *hiring*

committee members frequently mentioned using Student Instructor experience as a first filter to ensure relevant experience, but even that does not guarantee course development experience or a well-developed teaching philosophy. *Recent teaching faculty hires* almost unanimously commented on feeling surprised and/or overwhelmed by the transition to teaching faculty positions and sometimes mentioned uncertainty over the job expectations, especially for service and scholarship. *Current students* can roughly be categorized as those with teaching mentoring and those without. Those with teaching mentors expressed gratitude to their mentors and often credited serendipity for having found them. Those without teaching mentors expressed uncertainty over how to pursue teaching as a career and a lack of awareness of the teaching-related opportunities at their institution. Both groups wished for more resources and training.

The remainder of this paper presents a set of recommendations organized around stages of student interest in teaching: channeling interest in teaching, providing training in teaching, and preparing students for the CS teaching-focused job market.

Channeling Interest in Teaching

Since the experience of learning is heavily linked to the act of teaching in most settings, it is unsurprising that many students naturally develop an appreciation for or interest in teaching to some degree. For some students, teaching is a significant factor in their decision to pursue a PhD and academia. The earlier that students become interested in teaching, the more flexibility and information they have in shaping their educational and career choices (i.e., what courses, programs, and opportunities to pursue). Anecdotally, we still encounter students approaching graduation who lament that they didn't know that teaching-focused jobs existed or discovered them too late to realistically pursue them. Indulging students in their interest in teaching can be beneficial to the department's educational mission as well as to the students' program satisfaction and career prospects (whether to teaching-focused careers or other careers that involve teaching, such as R&T faculty).

Make Teaching Careers Visible to Students

Making teaching-focused careers visible to both undergraduate and graduate students will attract those with an existing interest in teaching, helping increase the size and potentially the diversity of the teaching-focused pool of candidates and making it easier to justify resources spent toward training in teaching. There are a variety of ways to spread information about teaching-related careers, but it can be difficult to capture students' attention, especially since they may discover their interest in teaching at different points in their academic journeys. We recommend implementing an assortment of teaching-related resources and events to increase

the likelihood that a student comes across one of them once they are interested in teaching; these efforts thankfully require less activation energy and organization than training programs.

Examples include:

- Featuring teaching-related opportunities on the department's website,

- Training faculty and career-oriented staff to be aware of teaching-focused careers,

- Hosting dedicated teaching career panels or adding a teaching-focused panelist to existing career panels,

- Granting space at career fairs for teaching booths,

- Offering a module on teaching in a "how-to-grad-school" seminar or a module on teaching careers in TA or instructor training, and

- Involving students in teaching-track faculty recruitment.

Departments should represent the diversity of teaching careers (e.g., at a research-intensive university, liberal arts college, primarily undergraduate institution, or community college) as students can be motivated differently by the specifics of each opportunity. These deciding factors may include scale (e.g., working closely with students in small classes vs. TAs for large classes or focusing on infrastructure), range of courses taught (i.e., heavy specialization in a large faculty vs. breadth in a smaller faculty), research environment (e.g., undergraduate vs. graduate students and access to research groups and talks), geographic locale, and student demographics. Presenting the range of possibilities will help students find a position that aligns with their skills and passions.

When providing information about teaching careers, another pitfall is focusing solely on the different aspects of running a course (i.e., teaching, management, and development). While this is the primary focus within teaching-focused careers, many positions have other expectations around service and scholarship (and what it means to be a faculty member) that are important to convey as students search for careers that interest them. Parts of these jobs that are often invisible to students and may be worth discussing include writing recommendation letters, understanding overall program curriculum and management, student and student group advising, working with others in teaching and committee work, promotion (and tenure) processes, and engaging with education communities.

Build a Community of Interest Around Teaching

Students who are interested in teaching-focused careers may feel isolated in their research groups, where teaching may not be a shared priority and graduate supervisors may lack sufficient knowledge to adequately support students interested in those careers. To fill this gap, departments can build a community of interest around teaching. This serves many purposes, including connecting a peer group that can offer mutual support, providing an avenue to target teaching information and opportunities, and attracting other students to teaching through announcements and meetings. While the study of CS education (research) and the practice of it (teaching) are distinct, we recommend connecting existing CS education groups to the community of interest around teaching to raise awareness of modern pedagogy and pedagogical questions.

Many independent efforts can help build community. Some examples include, in roughly increasing order of effort:

- **Opening up any existing education-related activities —** such as computer science education reading groups and teaching-focused seminars — to interested students and adding them to departmental calendars.

- **Establishing new web pages, mailing lists, virtual communities, or student groups** (e.g., [1]) to advertise teaching-related professional development activities, including center for teaching and learning seminars and workshops.

- **Creating or promoting teaching designations** to bundle key professional development activities and provide students with a concrete credential to include in their curricula vitae.

- **Develop new professional development opportunities** for faculty, current instructors, and students, such as hosting a seminar series on educational topics (e.g., [2]) or creating structured development programs that could include workshops, courses, and cohort-based deliverables (e.g., UBC's TDP).

Once students interested in teaching-focused careers connect, they can help support each other in their development and job searches, such as by providing feedback on practice talks and application materials. While not a sufficient replacement, this ensures that students can receive peer mentoring when faculty mentoring resources may be insufficient (see section: Make Teaching Mentors Available). Additionally, peers will be able to better relate to one another in facing new teaching challenges and entering the job market.

While not directly in service of connecting students, celebrating teaching in a similar way that many departments celebrate research accomplishments, such as awards, best papers, and

research in the news, serves the dual purpose of celebrating accomplishments and bringing awareness to teaching-related achievements and the community of interest around teaching. For example, TA awards can be presented based on student voting, student evaluation thresholds, nominations by faculty mentors (see sections: Make Teaching Careers Visible to Students and Build a Community of Interest Around Teaching), or longevity and service as a TA. Notable curriculum development projects led by TAs or Student Instructors can be highlighted on the department's newsletter or website.

Training in Teaching

Make Teaching Mentors Available

Mentorship is an invaluable resource for interested students to improve their teaching and learn more about teaching-focused careers, job responsibilities, and local opportunities. PhD and postdoctoral programs are designed around a mentorship/apprenticeship model for learning how to conduct research, and students interested in teaching would greatly benefit from analogous mentorship in teaching. We encourage departments to make teaching mentors available to graduate students and raise awareness of their availability (see section: Make Teaching Careers Visible to Students). Teaching mentors would complement existing research advisors for PhD students and postdocs, since those advisors may not be familiar with teaching mentorship.

Forms of teaching mentorship that students may find helpful include discussions of teaching and teaching careers, teaching observations, oversight for curriculum development or educational research projects, and advice on approaching the teaching job market (see section: Prepare Students for the CS Teaching-Focused Job Market). This can range from informal mentorship for students who express interest to formalized mentorship programs (e.g., Preparing the Professoriate and faculty coordinator for Student Instructors). While an advisor-advisee relationship with a faculty member invested in teaching would be ideal, this is likely infeasible at scale due to small numbers of faculty members (teaching or R&T) invested in teaching mentoring. More scalable methods of mentoring include coordinator-type roles in communities of interest (see section: Build a Community of Interest Around Teaching), building teaching mentoring capacity by training non-teaching faculty, and utilizing outside resources, such as staff in centers for teaching and learning.

To avoid overburdening faculty for doing such mentoring work, we encourage departments to recognize and reward them in some official manner, such as counting the mentoring work toward their service load or even offering teaching releases. To better support the mentors, we

recommend creating and sharing resources (e.g., a mailing list, faculty community of teaching mentors, best practices document for teaching mentoring).

Empower Teaching Assistants

Many graduate students work as teaching assistants, providing an opportunity for students to build instructional skills and gain valuable experience. Some tasks are synonymous with TA roles, including grading coursework, supporting students in office hours, answering questions via discussion boards or email, proctoring tests, and leading quiz/discussion/recitation/tutorial or lab sessions. However, the full range of allowable TA duties is likely more expansive than commonly understood and could be made more visible to all TAs, enabling those with greater interest in teaching to seek out less typical experiences, such as guest lectures and course development projects.

TA positions can be expanded to provide further opportunities for graduate students to prepare for teaching-focused careers. For example, graduate students can gain leadership, pedagogical, and logistical experience through Head TA roles. In this type of role, students could manage other TAs, craft course announcements, organize an aspect of the course such as course infrastructure or the grading of an assessment, or more, depending on the instructor's willingness to do individual mentoring. For Head TAs, consider having a different title for the role and a higher pay rate, rather than appointing someone unofficially, in order to increase the prestige and desirability of these positions and formalize the extra responsibilities.

Teaching-focused positions often involve curriculum or pedagogical development. If a department is developing a new course or undertaking a pedagogical project, they could consider hiring students into preparatory or development TA positions to help develop the course materials under the guidance of the instructor. This can be beneficial well beyond the end of the course, as students who complete this type of work can showcase the materials produced in their teaching materials.

Create Student Instructor Opportunities

Graduate students can receive even more professional development and experience through the opportunity to be a Student Instructor. While TAs are part of the instructional team and can see and participate in many aspects of running a course, there are still tasks that cannot be delegated to TAs or must be handled before TAs are even hired. Thus, a primary goal for these opportunities should be to provide mentorship and on-the-job training for graduate students to learn about the intricacies of managing an entire course and navigating difficult decisions (e.g., how to handle an academic integrity case or how to accommodate a student experiencing a family emergency). We would strongly discourage conscripting graduate students as Student

Instructors just to cover instructional needs; rather, this should be an opportunity that aligns with the students' skills and career goals.

The most common way to provide Student Instructor opportunities is to do it "in-house," where graduate students teach a course in the department's curriculum on their own, with another graduate student, or with a faculty member (as co-instructor or supervisor). There may also be instructor opportunities in other contexts for students to gain similar experiences and skills. These could include student-run courses (e.g., Berkeley DeCals and Stanford SICs), partnerships with local colleges (including community colleges), programs in high schools (e.g., the former Microsoft TEALS program), or external teaching arrangements (e.g., CodePath in Residence).

The policies for when and how a graduate student is offered this type of position should be carefully considered. Becoming a Student Instructor is typically much more time-consuming than being a TA, so the graduate student and their research advisor should expect slowed progress on research and coursework. For example, a unit might decide to make this type of opportunity available only to PhD students who have an approved dissertation proposal, for any graduate student who has taken a pedagogy course or has been a Head TA, or for graduate students participating in a future faculty program. Additionally, departments will need to consider whether a graduate student needs explicit permission from their research advisor, if applicable, to pursue such an opportunity.

Building on prior discussion of making teaching mentors available (see section: Make Teaching Careers Visible to Students), we recommend that departments develop infrastructure for mentorship of these Student Instructor experiences, which helps ensure a high-quality experience for both the instructor and their students and mitigates potential concerns with students as instructors. This mentorship could come through co-teaching, through formal coursework (e.g., an instructor training course), or structured faculty feedback with planned classroom observations and course material review. If there is not a faculty co-instructor, it may be advisable to have a faculty member who is ready and willing to backstop and support the graduate student if they encounter particularly challenging situations or become overwhelmed.

Offer CS-Specific Coursework on Pedagogy and Course Development

To better support Student Instructor opportunities and encourage innovation, departments can offer coursework on pedagogy. Many institutions have some type of program that provides generalized training and instruction on how to teach. These programs could be courses taught by an education department, a campus-wide TA training program, or even certificate programs offered by a center for teaching and learning. While these programs can provide wonderful

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support for students' professional development, they generally do not address the discipline-specific challenges and opportunities of teaching computing.

Graduate students (and many faculty) would be well-served to learn about the many evidence-based, discipline-specific pedagogical practices that have emerged from computing education research. For example, a CS-specific pedagogy course might focus on pedagogies developed to teach computing such as Parsons problems, Pair Programming, block-based programming languages (e.g., Scratch), and story-focused languages (e.g., Alice). Likewise, instruction could focus on general pedagogies that have proven to be particularly effective in computing contexts such as subgoal labeling, worked examples, peer instruction, and Process Oriented Guided Inquiry Learning (POGIL). Finally, a CS-specific course could focus on enabling students to use their programming skills to enhance course instruction and organization through techniques like autogeneration/randomization of problems, automated grading and feedback, plagiarism detection, and frequent, low-stakes assessments.

Such courses could also help students navigate some of the unique challenges of teaching computing, such as curricular choices for different programming paradigms and languages. Additionally, students could be specifically taught how to manage large enrollment courses that are common in computing. For example, a course might discuss things like how to manage a large course staff (possibly with multiple roles/titles and hierarchy), how to identify pedagogies and assessments that can scale with the number of students, how to proactively design courses to support students with a variety of disabilities, or how to coordinate office hours and other resources to support students' learning. Beyond pedagogical techniques, these courses could also be used to prepare students for the job market, discussed later in this paper.

While this coursework could be entirely theoretical and focused on disseminating knowledge, there is also an opportunity and a need to give graduate students experience with course development. Most teaching-focused positions will expect innovation in teaching over time (e.g., updating/modernizing content, developing new assessments, creating new courses), and this is often a skillset that students don't develop, even with Student Instructor experience. Portions of this coursework could be dedicated to common types of course development, and students can be asked to propose and receive feedback on course development projects of interest to them (possibly even coupled with an upcoming Student Instructor opportunity). Beyond proposing course development projects, students would further benefit from learning how to perform basic studies as to the efficacy of their interventions, completing the course development cycle that is valuable in these positions (proposal → intervention → data gathering → analysis).

Given that these types of courses weren't available to graduate students in the past, it is understandable that current faculty may not be well-versed in modern CS pedagogy, even

those who have been teaching for a long time. We encourage departments to collaborate with colleagues in other relevant departments (e.g., Education) and centers for teaching and learning in developing these courses. Some model courses exist (e.g., [Berkeley's CS302](#), [CMU's 15-890](#), [Stanford's CS298](#), and [Utah's CS6961](#)) that can be used as references, though these typically blend instructor preparation, pedagogy, and curriculum development in different proportions. These courses can have an increased impact by inviting faculty to attend or integrating their material into professional development for faculty.

Prepare Students for the CS Teaching-Focused Job Market

The goal of hiring processes is to evaluate and identify the best candidates for a particular position. However, these processes often involve activities that are proxies for the actual job responsibilities (e.g., a job talk as a proxy for running a course). As such, performing well at job interviews is a distinct skill from being a good teacher or faculty member. This has long been acknowledged, as many computing degree programs offer some form of interview preparation for internships and industry jobs, and graduating cohorts of students aiming for R&T faculty positions often receive heavy mentoring and support from faculty and each other.

Explicit preparation for the CS teaching-focused job market is an especially critical component in supporting students entering teaching-focused careers due to several well-documented challenges, including highly variable job expectations, substantial differences across departments in areas such as titles, advancement opportunities, appointment length, evaluation, and research expectations, and a lack of uniformity in recruiting processes [3, 4]. In addition, the people that students might normally turn to for advice (e.g., research advisor or career advising staff) are often unfamiliar with teaching-focused job recruiting, particularly for positions at institution types different from their own.

Here are some potential resources, training, and mentoring to share with graduate students interested in teaching careers:

- **Information on where to find teaching-track job ads** (e.g., [SIGCSE-jobs mailing list](#), [CRA Career Center](#), department websites).

- **Guidance on differences among teaching-focused jobs**, including how to identify job responsibilities and expectations from job ads and how recruiting timelines vary (e.g., liberal arts colleges typically start and finish their recruiting earlier than R1 institutions).

  - The desired teaching skillset also changes with the environment – teaching a small class at a liberal arts college is vastly different from teaching a large course at an R1 institution.

- If possible, send students to events that allow interactions with teaching faculty from different institutions (e.g., SIGCSE or CCSC conferences and education-focused workshops or conference tracks within their area of computing expertise).

- **Advice on who to ask for letters of recommendation**, including identifying letter writers who can speak to teaching ability, mentoring, and instructional leadership.

- **Feedback on application materials**, especially cover letters, teaching statements or portfolios, contextualization of teaching evaluations, and diversity statements.

- **Feedback on job talks**, including expectations and evaluation criteria.

- **Guidance on what information to seek during campus interviews and second visits**, including:

  - *Teaching culture* (e.g., mentorship, professional development, scheduling & rotation, TA & staff support, facilities, summers?),

  - *Faculty culture* (e.g., voting rights, advising abilities, offices, service, review and promotion processes),

  - *Alignment of actions with words* (e.g., diversity and student support), and

  - *Alignment with personal values and goals*.

- **Guidance on evaluating job offers and negotiating terms**, including:

  - *Time*: start date, first year schedule, teaching releases, service release/ramp-up;

  - *Money*: startup or discretionary funds, base and summer salary, relocation funds; and

  - *Support*: admin assistant, office space/needs, technology or laboratory needs.

While teaching faculty mentors are likely able to provide this advice (see section: Make Teaching Mentors Available), this approach doesn't scale well. Making resources available to many students at once (e.g., resource web pages and annual workshops) can help consolidate the information and ease the burden on teaching faculty and other faculty mentoring students in teaching. Additionally, creating a community among the teaching-focused students can help them share advice and get peer feedback (see section: Build a Community of Interest Around Teaching). Outside resources also exist (e.g., CRA-E's Career Landscape Workshop) but are necessarily general and not personalized enough for candidates.

Beyond advice, students interested in teaching careers can also be involved in the department's teaching faculty interviews, analogous to how R&T faculty candidates typically meet with PhD students in their research area. Job talks can be advertised broadly to all graduate students or specifically to those interested in teaching. Student meetings with faculty candidates, either 1-on-1, in a group, or over a meal, can be added to interview schedules. This allows those students to witness different teaching job talks and interact with candidates interested in teaching from other institutions and backgrounds, incorporating others' perspectives and refining their teaching philosophies and methods. Depending on the hiring process, this may also expose students to what a rubric for teaching faculty hiring looks like.

Concluding Thoughts

Computing departments are recognizing the importance of faculty who think deeply about changing courses and curricula, reflected in the growth of teaching-focused positions. This is especially critical in a field whose purview and role are rapidly evolving (e.g., quantum computing, blockchain, extended reality, machine learning, generative artificial intelligence). Graduate degree programs were designed primarily to train students for research; however, the growth of teaching-focused faculty positions should prompt departments to think strategically about how they can provide more access to teaching training for their graduates. This document provides suggestions to departments seeking to improve their own educational missions and computing education more broadly. While these practices are essential for preparing students for teaching-focused careers, they also benefit students pursuing a wide range of academic career paths and the departments they will ultimately join, by strengthening teaching capacity, mentoring, and instructional quality across the discipline. These investments, if made collectively, can improve the availability, visibility, scale, and expertise to sustain teaching training for our students.

For graduate students, training in teaching supports the many who are motivated to teach in the future (in teaching-focused positions or elsewhere). For departments, these efforts can benefit instructional capacity, educational quality, and program outcomes (e.g., graduate student job prospects and producing future graduate students). For institutions, excellence in teaching can reinforce the value of higher education to society and attract future students. From these perspectives, the preparation of excellent teaching faculty is a powerful tool that we should utilize more. Much more work needs to be done in this area, and we hope that this white paper will spur efforts that will one day lead to more concrete best practices in training for teaching-focused positions.

References

[1] Jolie Zhou, Yunseo Lee, Suh Young Choi, Simon Wu, and Mitchell Levy. 2025. *A Student-Led Association for Computing Education: A Two-Year Experience Report.* In Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 1 (SIGCSETS 2025). Association for Computing Machinery, New York, NY, USA, 1323–1329. https://doi.org/10.1145/3641554.3701963

[2] Mohammed Farghally, Mohammed Seyam, and Cliff A. Shaffer. 2024. *Towards Establishing a Training Program to Support Future CS Teaching-focused Faculty.* In Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 1 (SIGCSE 2024). Association for Computing Machinery, New York, NY, USA, 338–344. https://doi.org/10.1145/3626252.3630798

[3] Jennifer Campbell, Mark Floryan, Geoffrey Herman, Michael Hilton, and Jérémie Lumbroso. 2024. *Best Practices for Hiring Teaching Faculty in Research Computing Departments.* Computing Research Association. https://cra.org/resources/best-practice-memos/hiring-teaching-faculty-in-research-computing-departments/

[4] Penny Rheingans, Dan Grossman, and Jeff Forbes. 2018. *Laying a Foundation: Best Practices for Engaging Teaching Faculty in Research Computing Departments.* Computing Research Association. https://cra.org/teaching-faculty/

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