Routledge
Taylor & Francis Group

Change: The Magazine of Higher Learning

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/vchn20

An Instructional-Workforce Framework for Coordinated Change in Undergraduate Education

Mark Lee, Cassandra Volpe Horii, Ann E. Austin, Leanne Avery, Marielena DeSanctis, Noah Finkelstein, Emily Miller & Barbara Schaal

To cite this article: Mark Lee, Cassandra Volpe Horii, Ann E. Austin, Leanne Avery, Marielena DeSanctis, Noah Finkelstein, Emily Miller & Barbara Schaal (2023) An Instructional-Workforce Framework for Coordinated Change in Undergraduate Education, Change: The Magazine of Higher Learning, 55:1, 54-63, DOI: 10.1080/00091383.2023.2151809

To link to this article: https://doi.org/10.1080/00091383.2023.2151809

Published online: 01 Feb 2023.

An Instructional-Workforce Framework for Coordinated Change in Undergraduate Education

By Mark Lee, Cassandra Volpe Horii, Ann E. Austin, Leanne Avery, Marielena DeSanctis, Noah Finkelstein, Emily Miller, and Barbara Schaal

In Short

- The work of higher education instructors across many types of positions and institutions has been widely recognized as central to systemic change in undergraduate STEM education, and this work likely plays a strong role in other disciplines. The quality of instruction and other educational practices relates directly to the quality of student learning and to equitable and just outcomes for students.
- We propose an instructional-workforce framework that aligns and links three levers, key facets of organizations that, when applied appropriately, propel changes: the professional development leading to and throughout instructors' careers, their roles in academic governance, and the evaluation and reward systems related to their work.
- This framework provides guidance for change agents and initiatives in departments, schools, institutions, and disciplinary and other organizations, as well as for funding agencies, on how to engage with, support, and seek to improve conditions and practices for and with those who teach undergraduates.

Introduction

Effective, inclusive, equitable, and evidence-based teaching is widely recognized as a crucial part of higher education change efforts with direct implications for student success and belonging, particularly at the undergraduate level where coursework plays a large role. It is also essential that faculty enact effective curriculum design and policies that lead to student persistence and completion. Progress toward these educational practices has been slow, particularly in undergraduate STEM fields (Handelsman et al., 2022). One hindrance may lie in failing to recognize higher education instructors as a distinct workforce. The higher education instructional workforce includes tenured and tenure-track faculty, as well as non–tenure track educators who have various contracts and a range of titles like visiting faculty,

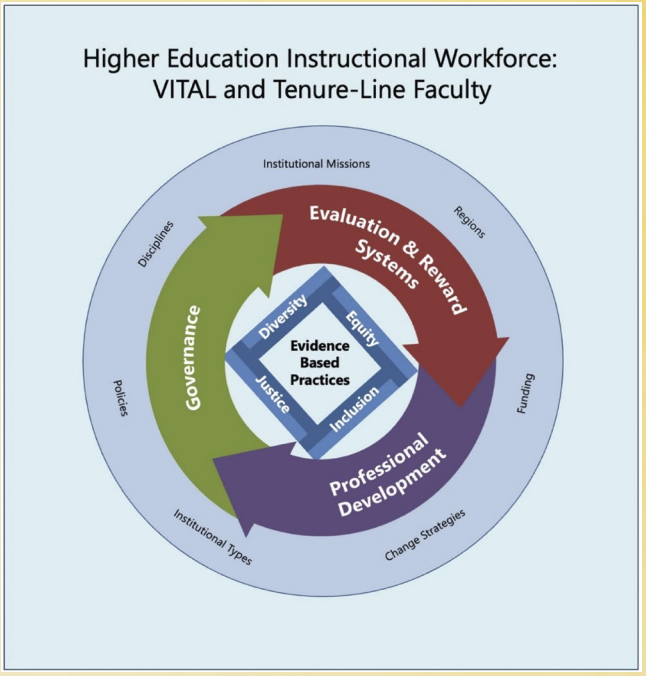
instructor, teaching assistant, teaching professor, adjunct faculty, and lecturer—VITAL faculty (Levy, 2019). As a workforce, this group encounters linked issues related to their preparation for, entrance into, progress through, rewards for, and inclusion in the governance of the institution and instructional work, across institution types and forms of faculty appointments, all of which may affect whether and how they implement forms of teaching associated with inclusion, equitable outcomes, and participation in a just educational system for diverse students.

We therefore propose a Higher Education Instructional-Workforce Framework that attends to the breadth of individuals, roles, responsibilities, disciplines, and institutions. With principles of justice, equity, inclusion, and diversity at its core, the framework has the potential to support institutions seeking to advance their educational missions by helping them enact coordinated change across three intertwined aspects of instructional work: governance, professional development, and evaluation and reward systems. Figure 1 shows a conceptual diagram of this framework.

Building on decades of work on evidence-based and inclusive STEM educational practices (Grunwald Associates, 2022), theories and practices of institutional change (Weaver et al., 2015), and new models for faculty roles (Gappa et al., 2007; Kezar & Maxey, 2016), this holistic workforce framework can support institutions and departments in considering the full range of faculty appointments and teaching personnel to advance effective, equitable, inclusive, and just educational practices. Because contingent faculty now represent about 70% of the instructional workforce that undergirds many college and university programs, it is essential that the framework embraces respect for VITAL faculty, who have long been marginalized in all three of the above aspects of instructional work and who today are a more diverse population than tenure-line faculty. The Higher Education Instructional-Workforce Framework is also meant to inform the work of national organizations, state-wide higher education systems, disciplinary and professional societies, and other groups seeking to enact change in undergraduate education to address factors affecting the instructional workforce, and therefore teaching, curriculum, and policies, in coordinated and coherent ways.

This approach to coordinated change acknowledges the challenges facing higher education instructors, while supporting instructor and student thriving at institutions with distinct and diverse missions and populations.

Figure 1. Higher Education Instructional-Workforce Framework Depicting Three Essential and Interconnected Levers (Governance, Professional Development, and Evaluation and Reward Systems) that Support the Workforce in Conducting Core Educational Activities in Higher Education, Embedded within a Larger Context and Centering Diversity, Equity, Inclusion, Justice, and Evidence-Based Practices



The Higher Education Instructional-Workforce Framework

Workforce development models, while varying in definitions and approaches, connect the multiple interwoven phenomena affecting employment

and effectiveness in occupations and sectors of interest. These phenomena include the preparation and ongoing learning of workers; the support organizations offer to workers; the wider social and economic factors such as demand for workers, changes in conditions, and methods of work that impact effectiveness positively or negatively; and changes in governmental policy affecting workers and organizations (Jacobs & Hawley, 2009). VITAL and tenure-line faculty in higher education represent a distinct workforce. According to the World Bank SABER project, "great outcomes" in workforce systems occur when employers provide ongoing support, learning opportunities, and feedback to workers; employers and workers alike have confidence in training; those trained are able to find and flourish in secure jobs; and the system as a whole can adapt to changing conditions (World Bank, 2013). For the higher education instructional workforce, these characteristics are mainly determined by the three levers discussed below, which form the core targets for coordinated action. By identifying a limited set of levers that function individually and in interaction, this workforce approach provides a manageable planning and implementation tool.

We discuss each lever below, explaining its influence on meeting the needs of the instructional workforce, impact on the effectiveness of the instructional workforce, and connection with other levers. Key questions and prompts for change agents and initiatives specific to each lever in the framework are provided as a supplementary resource, available at https://www.nationalacademies.org/event/10-24-2022/exploring-and-mapping-the-system-of-undergraduate-stem-education. Box 1 provides examples of the framework's application.

BOX 1.

Example applications of the Higher Education Instructional-Workforce Framework.

Example 1: A regional comprehensive university is reforming introductory STEM courses to include more structure and active learning to improve inclusion and equitable student success. Their plan involves team teaching with tenure-line faculty, lecturers, and TAs. Using the framework, department chairs realize that lecturer and TA appointments do not include time for the *professional development* needed to learn and practice the new methods and that lecturers may be disincentivized by the fear of changes in results on student experience of teaching surveys, since their *evaluation* and reappointment are tied closely to the surveys. The department chairs, leveraging their department *governance* roles, then convene a working group with lecturers and TAs, who are paid, along with tenure-line faculty, to make recommendations about professional development, collaboration practices for teaching teams, and policies for use of student survey results, along with other evidence of teaching effectiveness in reformed classes.

Example 2: A community college relies on working professionals from a key regional industry as part-time instructors. The college is having trouble hiring enough instructors. Using the framework, institutional leaders decide to engage the faculty *governance* body in a joint study of past and prospective part-time instructors in the region, to determine barriers and *rewards* at play in the shortage. The joint study yields insights about class formats, times, and locations that are more conducive to part-time instructors and still accessible to students, as well as needs for *professional development* and support for pedagogy that best leverages the instructors' industry expertise in a college setting, because many are new to teaching. Going forward, the governance body includes several part-time instructors on their official roster of faculty representatives.

Governance

We define governance as decision-making structures and mechanisms related to departmental and institutional priority-setting processes, policy development, and resource allocation to advance the educational mission. In an effective, coordinated instructional workforce system, broader institutional governance bodies and those at the department level are all involved in setting coherent policies at multiple levels; these policies influence practices related to academic program design, implementation, and performance. For example, policies can grant time and resources in support of professional development on effective, inclusive courses and curricula; policies can also address academic standards and extenuating circumstances, which are known to impact student belonging, success, and the equity of outcomes in and beyond undergraduate degree attainment. Governance bodies must also communicate policies to prospective and current members of the

instructional workforce, engendering confidence and a sense of meaning and agency in teaching, related to the institutional mission and goals. Ideally, governance establishes instructional roles such that they are equitable, offer secure and long-term contracts, provide a living wage and pathways for advancement, and enable full participation in the educational life of the institution—including participation in governance itself. Finally, governance has an important role in securing resources to support teaching and the instructional workforce.

To satisfy the above characteristics from a workforce lens, the entire instructional workforce needs to be able to contribute to discussions and have a say in decisions related to the educational mission of the institution. Departments and programs typically set the amount of agency available to those involved in teaching, often based on faculty rank and appointment types, which may limit contributions, particularly from VITAL faculty. As Kezar and Maxey (2016) suggest, expanding governance participation may alleviate some of the challenges of departmental initiatives like curriculum renewal that have added to tenured faculty workloads.

Participation in governance is particularly important because of the demographic inequities across faculty appointment types and work; this is an issue of justice for the instructional workforce, especially in terms of the perspectives that diverse faculty bring to policy decisions that impact students. Most faculty with the academic rank of professor are white men, whereas early career tenure-line faculty and full-time VITAL faculty tend to represent more diverse backgrounds in terms of gender, race and ethnicity, or both (National Center for Education Statistics (NCES), 2022). Even among tenure-line faculty, workloads are unevenly distributed, with women and minoritized faculty doing more teaching, mentoring, and service work (O'Meara et al., 2021). Rates of faculty with disabilities are largely unavailable, but estimates indicate that they are underrepresented in higher education and likely to be increasing (Friedensen et al., 2021). When members of the instructional workforce are excluded from governance, a disproportionate fraction of minoritized faculty, as well as those focused primarily on teaching, lack the ability to advocate for or advance the issues related to their professional needs and those of students from diverse backgrounds. At times, VITAL faculty have responded by forming unions as a mechanism to address poor relationships, mistrust, lack of communication, and underappreciation. Alternatively, established unions can be highly integrated into revising policies, as observed, for example, in the University of Oregon's commitment to evaluating professional, inclusive, engaged, and research-led teaching practices (https://provost.uoregon.edu/revising-uos-teaching-evaluations).

Governance, in an instructional-workforce approach, also has a responsibility to align instructional roles and work with departmental, institutional, and sector-wide goals and priorities. Some of the most promising work by governance relates to redefining faculty roles to better meet educational objectives, such as creating and codifying differentiated faculty roles, some of which focus on teaching, with increased job security, pathways for career advancement, and opportunities to participate in governance (Kezar & Maxey, 2016). Additionally, governance bodies have a role in defining teaching excellence and implementing evaluation processes that are free from bias and include multiple kinds of evidence. Likewise, governance can clearly define the positive and necessary role of visiting and part-time instructors, such as those teaching while continuing active careers in industry, education, medical practice, and other fields, creating more equitable policies. Governance-created policies can also ensure that team approaches to teaching are recognized, resourced, and rewarded; such approaches are increasingly necessary for supporting students, especially in large-enrollment undergraduate courses.

Given the differences in missions and contexts across institutions, governance structures need to vary. Yet, regardless of institutional context, this workforce framework identifies underlying criteria for inclusive governance structures that ensure support for undergraduate education. Despite the multifaceted ways in which governance structures impact the higher education instructional workforce, and, by extension, teaching and student learning and success, governance has not emerged as a central focus of educational change efforts. Leaving governance out of educational change initiatives undermines impact, sustainability, and equity, as indicated

> In the Higher Education Instructional-Workforce Framework, professional development includes individual and group programs that support VITAL and tenure-line faculty (current and prospective) in acquiring, practicing, and advancing educational skills and mindsets as part of their funded academic duties.

by the deep linkages to other key system components through the instructional workforce.

Professional Development

Prior research and implementation efforts have highlighted key educational practices that enhance and advance learning for all students while contributing to diversity, equity, inclusion, and justice (Grunwald Associates, 2022). Professional development experiences are an important way to encourage and support members of the instructional workforce to use evidence-based and culturally relevant instructional practices that enhance equity, belonging, and accessibility.

In the Higher Education Instructional-Workforce Framework, professional development includes individual and group programs that support VITAL and tenure-line faculty (current and prospective) in acquiring, practicing, and advancing educational skills and mindsets as part of their funded academic duties. Such professional development occurs within institutions, including programs offered by centers for teaching and learning, STEM education centers, and offices of faculty development, and across institutions in institutes and courses on teaching offered by disciplinary societies and other organizations.

In an optimal instructional-workforce system, professional development supports educators' growth in flexible and accessible ways, across the full span of institutions, roles, and career stages, and incorporates new insights concerning effective, inclusive, and equity-focused practices that emerge from educational research. While additional research is needed about the impacts of various forms of professional development, it is well established that professional development tends to improve instructors' teaching and students' learning and that ongoing and iterative professional development tends to be more helpful than short-term or one-time interventions (Wright et al., 2018).

Prior to entering the higher education instructional workforce, which for many occurs during graduate school in teaching assistant positions and for others in first-time appointments as instructors of record (which may be in tenure-track, visiting, lecturer, adjunct, instructor, or other contingent roles), professional development is now more widely available than in the past. The Center for the Integration of Research, Teaching, and Learning (https://www.cirtl.net/), a multi-institution network for graduate and postdoctoral professional development, is a prominent example with a strong focus on equity-oriented teaching and diverse learners. Departments, centers for teaching, and STEM education centers offer training programs and institutes, such as TA orientations, disciplinary pedagogy courses, course design institutes, and new faculty orientations. These opportunities increasingly focus on

> *Professional development is a lever that intricately links to other facets of the system and can make or break the ability of the instructional workforce to achieve institutional goals related to undergraduate education.*

inclusive and equity-minded undergraduate teaching (e.g., Kennedy et al., 2022), and research on their impact points to factors that predict implementation (Addy et al., 2021). Yet, in many cases, participation remains inadequately incentivized and encouraged, including in the mixed messages sent to graduate students about allocation of time and effort to research vs. teaching, and in uneven policies and pay for VITAL faculty for their engagement.

Early and later-career faculty may also participate in disciplinary and professional-society teaching institutes. While many institutes originally focused on tenure-line faculty, these opportunities have expanded to include more VITAL faculty. Advances in the design, evaluation, and recognition of promising models of professional development specifically for non–tenure track faculty have also emerged (Culver & Kezar, 2021). Whether institutions provide time, funding, and follow-up support for members of the instructional workforce to implement practices learned in these programs varies greatly, despite growing understanding that institutional support plays a significant role in sustaining inclusive and evidence-based teaching (Bathgate et al., 2019). Institutions should continually review the allocation of professional development resources to ensure equity and work toward more effective, inclusive, and accessible support (Culver & Kezar, 2021).

Professional development is a lever that intricately links to other facets of the system and can make or break the ability of the instructional workforce to achieve institutional goals related to undergraduate education. For example, policies set by governance may bolster or hinder VITAL and/or tenure-line access to professional development, such as whether opportunities are available within the institution and whether and to whom funding and time are granted for participation. Professional development programs may also help prepare instructional workforce members to participate in governance activities; if engagement in governance is to become more equitable and representative of the full diversity of the instructional workforce, across demographics and roles, this preparation is crucial.

Evaluation and Reward Systems

The final lever in the Higher Education Instructional-Workforce Framework involves evaluation and reward systems that encourage, assess, and recognize effective educational practices; such systems are typically established by governance and, in turn, supported by professional development. In a robust and coordinated higher education instructional-workforce system, evaluation and reward systems include competencies that are relevant and impactful for effective and inclusive undergraduate education, provide benchmarks of achievement through descriptive criteria, articulate multifaceted forms of evidence that demonstrate accomplishment and growth, and define clear methods and timelines for both formative feedback that supports VITAL and tenure-line faculty in reflecting on and improving their teaching and summative evaluation at key junctures related to professional advancements such as promotion.

There are an increasing number of calls for and models of overhauling teaching evaluation systems to make them more scholarly, aligned, equitable, and transparent (NASEM, 2020). Developing an

effective evaluation system externalizes goals and expectations for members of the instructional workforce, ideally aligned with institutional and department aspirations for student learning, inclusion, and equity, while also providing a developmental trajectory.

These approaches also can make a more equitable and inclusive workplace. O'Meara et al. (2022) argue for focusing on "the principles of transparency, clarity, accountability, context, credit, consistency, flexibility, agency, and representation" in evaluation systems. These approaches will benefit all within the instructional workforce. Such a system can also reward participation in governance, so that the organizational and leadership work of improving undergraduate education becomes a clearly valued activity. In these ways, evaluation systems that are well aligned across levers in the framework create positive feedback loops, providing incentives and recognition for actions that simultaneously advance instructional workforce members' careers, positively impact students, and contribute to the educational mission of the institution.

We might also consider forms of recognition outside of formal evaluation and reward structures—for example, the awards, news stories, social recognition, and discourse related to teaching that are present within an institutional or departmental context. These aspects of culture and communication are insufficient on their own but together can reinforce reflection, meaning-making, celebration, and sharing of nuanced examples that elevate engagement, creativity, inclusivity, and effectiveness of teaching by tenure-line and VITAL faculty members.

Reform of evaluation and reward systems to better address educational work is progressing through individual and multi-campus projects, and it is crucial that those efforts expand to more institutions. It is also essential that evaluation and reward structures provide professional advancement pathways for VITAL faculty, as institutions in the University of California system and elsewhere have begun to do by establishing career ladders and defining promotion criteria that make VITAL positions similar to tenure-line roles, including security of employment. Methods for evaluating teaching must be included for all members of the instructional workforce—anyone who teaches. The methods must attend to biases and be appropriately nuanced to support institutional goals related to the belonging, inclusion, and success of students and members of the instructional workforce alike.

As discussion of the three levers above has shown, various efforts have addressed each one on its own to greater and lesser degrees. The Higher Education Instructional-Workforce Framework highlights the importance of addressing them in a coordinated way in order to utilize their full integrative power to support and advance excellence in undergraduate education—something that, to our knowledge, is not yet a systematic practice.

Conclusion

As the higher education sector commits to advancing diversity, equity, inclusion, and justice, the success of all students must be a primary goal that universities and colleges share. The quality of instruction is directly related to the quality of undergraduate learning and engagement. Thus, supporting and strengthening the entire academic workforce—the tenured and tenure-track along with the wide range of VITAL faculty (visiting faculty, instructors, teaching assistants, teaching professors, adjunct faculty, and lecturers)—is a critical tool for creating more inclusive, diverse, and equitable learning contexts and advancing student success. This framework may allow campuses to move from disconnected programs and alienated individuals to a coordinated community of transformation (Kezar et al., 2018) in support of our common goals of advancing education for all college students. The Instructional-Workforce Framework offers an explicit pathway for higher education institutions, as well as for partner organizations across the higher education landscape such as disciplinary associations, national convening bodies, and funders, for supporting and strengthening the academic teaching workforce.

Several elements of the Instructional-Workforce Framework enhance its utility and potential impact. First, the framework takes a systemic approach to supporting academic work and the goal of improving undergraduate education. That is, the framework reflects a recognition that change in higher education requires the use of multiple levers across institutional processes. In this case, the framework addresses how instructors do their work (the lever of professional development), how they are evaluated and rewarded

> As the higher education sector commits to advancing diversity, equity, inclusion, and justice, the success of all students must be a primary goal that universities and colleges share. The quality of instruction is directly related to the quality of undergraduate learning and engagement.

for that work (the lever of the evaluation and reward system), and the processes of advancing those priorities through the inclusion of multiple voices (the lever of governance). By showing the relevance of each of these elements and the ways in which they weave together, the framework provides a tool for thinking and acting systemically in support of institutional goals to improve student learning.

Second, the framework recognizes and embraces the reality that the VITAL and tenure-line faculty engaged in advancing the mission of undergraduate student learning in American higher education constitute a group diverse in appointment types, personal characteristics, and disciplines and fields. While historically those in tenure-system positions have been privileged over others, a viable approach to workforce development and high-quality teaching requires broad and full inclusion. The framework presented here provides avenues for considering how each instructor—regardless of appointment type—is valued and included in governance, supported in their own professional growth, and evaluated in ways that encourage ongoing growth, effectiveness, and excellence.

Third, the framework is relevant to the full range of institutional types constituting the higher education landscape—for example, liberal arts colleges, community colleges, regionally focused institutions, and research universities. At the same time, the framework is relevant beyond the institution level to include the full spectrum of stakeholders committed to improving undergraduate education in service to increasing engaged and effective student learning for a diverse group of learners—that is, it is relevant for institutional leaders, unions representing members of the instructional workforce, disciplinary and national organizations, funders, and individual instructors.

Institutional leaders can use the framework to take a look at the various levers through which they can create a systemic institutional approach to supporting the instructors engaged in efforts to create effective and inclusive learning processes and contexts. Leaders can also examine the messages they provide to the institutional instructional community about who is valued, in what ways their ideas are invited, and which practices are expected, evaluated, and rewarded. Department chairs and committees can use each of the three elements of the framework to pose questions about how VITAL and tenure-line faculty in their unit can participate in decision making, enjoy readily available opportunities to deepen their knowledge of evidence-based teaching practices, and participate in evaluation systems that clarify expectations and reward impactful contributions to student learning and success. Similarly, the framework can help union leaders identify avenues for improving the conditions for and effectiveness of the instructional workforce, related to shared educational goals.

Disciplinary associations and national higher education convening organizations also have a role in signaling the value of the full array of instructors and the importance of supporting them through effective governance processes, professional development opportunities, and evaluation

practices. These organizations can use conferences, convenings, and highlighted resources to advance the well-being and effectiveness of the instructional workforce. Similarly, funding agencies can support innovative efforts in each area of the framework for purposes of developing and disseminating useful practices and facilitating cross-institutional collaboration and learning.

Individual members of the instructional workforce across universities and colleges also can use the framework to help them target where to place their time and energies. Recognizing the relevance of each element of the framework, they can seek and take on governance roles; commit to ongoing, purposeful professional development; and use evaluation processes as explicit opportunities to reflect on achievements, obtain useful feedback, and align individual interests with institutional priorities.

Investing in the instructional workforce is a wise strategic action at all levels of the higher education system. Aligning governance, professional development, and evaluation and reward systems as part of a commitment to creating inclusive and equitable learning contexts and improving the success of the full array of diverse undergraduate learners is a central goal for higher education. The framework provides a perspective and tool that highlights alignment of values and actions in service to a strong instructional workforce and high-quality and inclusive student learning experiences.

Acknowledgments

The authors are members of the National Academies Roundtable on Systemic Change in Undergraduate STEM Education (https://www.nationalacademies.org/our-work/roundtable-on-systemic-change-in-undergraduate-stem-education) and were inspired to write this article by their conversations at roundtable meetings. The article represents the authors' views and not those of the National Academies of Sciences, Engineering, and Medicine. We thank Starlette M. Sharp for conceptual and graphic-design contributions. C

ORCID

Ann E. Austin http://orcid.org/0000-0001-9889-5815

Mark Lee https://orcid.org/0000-0002-6984-4645

Cassandra Volpe Horii https://orcid.org/0000-0001-8609-1430

Leanne Avery https://orcid.org/0000-0002-8768-9247

Noah Finkelstein http://orcid.org/0000-0002-4783-4964

Resources

- Addy, T. M., Reeves, P. M., Dube, D., & Mitchell, K. A. (2021). What really matters for instructors implementing equitable and inclusive teaching approaches. *To Improve the Academy*, *40*(1). https://doi.org/10.3998/tia.182
- Bathgate, M. E., Aragón, O. R., Cavanagh, A. J., Frederick, J., & Graham, M. J. (2019). Supports: A key factor in faculty implementation of evidence-based teaching. *CBE Life Science Education*, *18*(2) 18:ar22, 1 - 18:ar22, 9. https://doi.org/10.1187/cbe.17-12-0272
- Culver, K. C., & Kezar, A. (2021). *Designing accessible and inclusive professional development for NTTF*. University of Southern California. Pullias Center for Higher Education. https://pullias.usc.edu/download/designing-accessible-and-inclusive-professional-development-for-nttf
- Friedensen, R. E., Horii, C. V., Kimball, E., Lisi, B., Miller, R. A., Siddiqui, S., Thoma, H., Weaver, J. E., & Woodman, A. (2021). A systematic review of research on faculty with disabilities. *Journal of the Professoriate*, *12*(2), 2–25. https://caarpweb.org/jotp-fall-2021/.
- Gappa, J. M., Austin, A. E., & Trice, A. G. (2007). *Rethinking faculty work: Higher education's strategic imperative*. John Wiley & Sons, Inc.

Resources (cont'd)

- Grunwald Associates. (2022). *Undergraduate STEM education: Key insights from select NASEM Publications.* https://www.nationalacademies.org/event/05-23-2022/roundtable-on-systemic-change-in-undergraduate-stem-education-spring-hybrid-meeting

- Handelsman, J., Elgin, S., Estrada, M., Hays, S., Johnson, T., Miller, S., Mingo, V., Shaffer, C., & Williams, J. (2022). Achieving STEM diversity: Fix the classrooms. *Science*, *376*(6597), 1057–1059. https://doi.org/10.1126/science.abn9515

- Jacobs, R. L., & Hawley, J. D. (2009). The emergence of 'workforce development': Definition, conceptual boundaries and implications. In R. Maclean & D. Wilson (Eds.), *International handbook of education for the changing world of work* (pp. 2537–2552). Springer. https://doi.org/10.1007/978-1-4020-5281-1_167

- Kennedy, S. A., Balija, A. M., Bibeau, C., Fuhrer, T. J., Huston, L. A., Jackson, M. S., Lane, K. T., Lau, J. K., Liss, S., Monceaux, C. J., Stefaniak, K. R., & Phelps-Durr, T. (2022). Faculty professional development on inclusive pedagogy yields chemistry curriculum transformation, equity awareness, and community. *Journal of Chemical Education*, *99*(1), 291–300. https://doi.org/10.1021/acs.jchemed.1c00414

- Kezar, A., Gehrke, S., & Bernstein-Sierra, S. (2018). Communities of transformation: Creating changes to deeply entrenched issues. *The Journal of Higher Education*, *89*(6), 832–864. https://doi.org/10.1080/00221546.2018.1441108

- Kezar, A. & Maxey, D. (Eds.). (2016). *Envisioning the faculty for the 21st century*. Rutgers University Press.

- Levy, R. (2019). *VITAL faculty: A growing workforce in colleges and universities*. Blog: Mathematical Association of America. https://www.mathvalues.org/masterblog/vital-faculty

- NASEM. (2020). *Recognizing and evaluating science teaching in higher education proceedings of a workshop—In brief*. The National Academies Press. https://doi.org/10.17226/25685

- National Center for Education Statistics. (2022). *Characteristics of postsecondary faculty.* Condition of Education. U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/csc

- O'Meara, K., Culpepper, D., Misra, J., & Jaeger, A. (2021). *Equity-minded faculty workloads: What we can and should do now*. American Council on Education (ACE). https://www.acenet.edu/Documents/Equity-Minded-Faculty-Workloads.pdf

- O'Meara, K., Templeton, L., Culpepper, D., & White-Lewis, D. (2022). *Translating equity-minded principles into faculty evaluation reform*. American Council on Education (ACE). https://www.acenet.edu/Documents/Equity-Minded-Faculty-Evaluation-Reform.pdf

- Weaver, G. C., Burgess, W. D., Childress, A. L., & Slakey, L. (Eds.). (2015). *Transforming institutions: Undergraduate STEM education for the 21st century*. Purdue University Press.

- World Bank. (2013). *What matters for workforce development: A framework and tool for analysis*. SABER Working Paper Series No. 6. https://www.worldbank.org/en/topic/education/brief/systems-approach-for-better-education-results-saber

- Wright, M., Horii, C. V., Felten, P., Sorcinelli, M. D., & Kaplan, M. (2018). Faculty development improves teaching and learning. *POD Speaks #2*. https://podnetwork.org/faculty-development-improves-teaching-and-learning/