

Developing Confidence, Developing Skills: The Perceived Effect of Professional Development on Online Teaching

Michael S. Hill
University of the Pacific

Cassandra M. D. Hart
University of California, Davis

Rachel B. Baker
University of Pennsylvania

Di Xu
University of California, Irvine

Emily Alonso
University of California, Davis

Alyssa Nguyen
University of California, Davis

Kim d'Arcy
Saddleback College

Cheryl Bailey
Irvine Valley College

Tim VanNorman
Irvine Valley College

Vivian Nguyen
Saddleback College

Jennifer Pakula
Saddleback College

Abstract

A large body of research has documented weaker student performance in online courses relative to face-to-face courses across multiple outcomes, including grades, course completion, and persistence. These gaps are particularly pronounced for underserved students. In response, colleges and universities have sought to improve the quality of online instruction by providing technology resources, student and faculty technical support, and, the focus of this study, professional development for faculty teaching online. However, despite the increasing popularity of professional development for online instructors, evidence on its effectiveness in shaping faculty practices and confidence remains limited. This study used survey data from 82 faculty at two Southern California community colleges following

participation in structured professional development programs designed to improve online teaching. The professional development programs focused on core learning theories and practical strategies for engaging virtual learners. We find that the majority of faculty reported adopting techniques related to the creation of a supportive and welcoming environment, recorded video introductions and lectures, and increased student-student interaction. In addition, instructors reported increased confidence in adopting teaching methods in almost all assessed areas. In technical areas, most respondents reported increased confidence in skills related to building an online course, creating online assignments and materials, and interacting with students. In soft skill areas, most respondents reported increased confidence in skills related to development of a welcoming, equitable online environment. These survey results underscore the critical role of professional development in shaping instructors' online teaching confidence and practices.

Keywords: Professional development; Training; Online teaching; Pedagogy; Postsecondary education; Fully-online classes

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Introduction

Online education is often seen as a means to expand access and promote equity in higher education, particularly for historically underserved students and nontraditional learners (Means et al., 2010; Seaman et al., 2018). For instance, online courses can offer greater scheduling flexibility for working students or caregivers and expand geographic access for students in remote and rural locations (Hill & Hart, in press; Jaggars, 2014). However, the impact of online education on student outcomes has been mixed. A robust body of research has found poorer student performance in online courses compared to face-to-face courses along multiple outcomes, including student grades, probability of course completion, and probability of overall persistence (e.g., Bettinger et al., 2017; Hart et al., 2018; Johnson & Mejia, 2014; Xu & Jaggars, 2011; Xu & Xu, 2019; Xu & Xu, 2020). The gaps in student outcomes tend to be more pronounced for students typically underserved in higher education, such as Black and Hispanic students (Hart et al., 2018; Xu & Jaggars, 2014). However, other studies point to specific settings and instructional strategies that may reduce performance gaps between online and traditional instruction (e.g., Johnson & Mejia-Cuellar, 2014; Paul & Jefferson, 2019). In response, colleges and universities have sought to improve the quality of online instruction through strategies such as providing technology resources, providing student and faculty technical support, and offering professional development for faculty who are teaching online (Brooks & Grajek, 2020; Scherer et al., 2021).

Online teaching differs from face-to-face instruction in several ways (Dennen et al., 2022; Rovai, 2004; Xu & Xu, 2019), suggesting the need for specific professional development. First, online teaching requires a set of technology skills related to the design of the class, delivery of instruction, and management of the class in the learning management system (Brinkley-Etzkorn, 2018; Rovai, 2004). In addition, online course design and delivery both require distinct strategies and planning to provide effective instruction (Philipsen et al., 2019). In addition, building a sense of community and social presence for both instructors and students can be challenging (Garrison et al., 1999; Garrison & Arbaugh, 2007; Rovai, 2004; Shea & Bidjerano, 2010). Despite these unique challenges to online teaching, research conducted in California Community Colleges suggested that immediately prior to the COVID-19 pandemic, most faculty teaching online were not trained in skills such as fostering student-to-student interaction or class organization (Hart et al., 2021a). A lack of training specific to online instruction may result in substantial learning costs for faculty when they first teach online, regardless of prior teaching experience (Brooks & Grajek, 2020; Scherer et al., 2021).

Historically, many professional development offerings for online instruction have targeted the technology skills necessary to design and deliver learning online (Lewis & Abdul-Hamid, 2006; Segrave et al., 2005). However, a growing number of colleges have begun offering comprehensive professional development that incorporates practical instructional strategies related to online teaching as well as an explanation of the theoretical basis for these approaches (Bailey & Card, 2009; Baran & Correia, 2014; Borup & Evmenova, 2019; Segrave et al., 2005). Strategies can include the application of best practices focused on online classroom management; the development of a humanized, welcoming and inclusive learning environment; and the facilitation of active and applied learning activities (Mohr & Shelton, 2017, Xu et al., 2025). Despite institutional and faculty investments in training, there is limited empirical evidence related to the influence of professional development on faculty behavior when teaching online.

This study uses survey data from faculty at two Southern California community colleges, Saddleback College and Irvine Valley College, that offered structured professional development programs for faculty to improve online teaching. This training focused on several key theoretical learning concepts and practical online best practices, particularly related to making meaningful connections with virtual learners. The purpose of this study is to better understand instructors' perceptions of the extent to which such training exposed them to new areas of skill, as well as the extent to which instructors reported changes in practices and confidence in online teaching following the training. Insights gleaned from this study may help administrators at other colleges who are considering implementing professional development to hone faculty online teaching skills.

Literature Review

Professional Development in Higher Education

There has been a substantial increase in the professional development opportunities for postsecondary instructors focusing on online teaching and learning (Lay et al., 2020; Leary et al., 2020). This growth has been particularly pronounced since the COVID-19 pandemic, which forced institutions to rapidly adopt remote instruction (Hart et al., 2021a) and develop professional development opportunities for faculty and staff (Chan et al., 2021). Colleges and universities across the country have expanded their professional development offerings, signaling a broader recognition of the importance of faculty training in improving online education (Allen & Seaman, 2010; Brooks & Grajek, 2020). For instance, there are several organizations—like the Online Learning Consortium (Online Learning Consortium, n.d.) and Quality Matters (Quality Matters, n.d.)—that provide training and certifications in online teaching that are built following best practices to improve student engagement and success in both online and blended learning environments.

Improving online course quality is important because while online courses offer flexibility and broad access, research consistently shows that successful online learning often imposes greater challenges on community college students, particularly among groups of students typically underserved in higher education, such as Black and Hispanic students (Hart et al., 2018; Xu & Jaggars, 2014). These students often face not only technological and logistical barriers but also a lack of connection and engagement in virtual classrooms (Pacansky-Brock et al., 2020).

In response, many researchers and practitioners have called for a shift toward “humanizing online teaching,” a pedagogical approach that emphasizes empathy, trust, equity, and authentic instructor-student relationships as a foundation to online learning success (Pacansky-Brock et al., 2020; Xu et al., 2025). By creating stronger instructor presence, using more inclusive language, providing personalized and empathetic feedback, and designing spaces for student voices, humanized practices have the potential to foster student sense of belonging, confidence, and engagement, especially among students from historically marginalized groups (Garrison et al., 1999; Garrison & Arbaugh, 2007; Pacansky-Brock et al., 2020; Rovai, 2004; Xu et al., 2025). Yet, to implement humanizing practices, as well as other effective online instructional techniques, faculty must develop new pedagogical skills and mindsets through targeted training for online instruction (Powell & Bodur, 2019; Rovai & Downey, 2010; Wolf, 2006).

Other aspects of online courses demand unique approaches as well. For instance, course content in online courses must be presented thoughtfully. The use of modules within learning management systems can make course organization clearer, while using a variety of presentation methods (e.g., using video and audio as well as text) can help improve student engagement (Rovai, 2004; Jaggars et al., 2013). Advances in educational technology, such as learning management systems and multimedia tools, have created a pressing need for faculty to adopt new methods and tools effectively (Brinkley-Etzkorn, 2018). To address these unique demands to online teaching, many institutions now offer professional development programs for online instruction (Hart et al., 2025), underscoring their growing importance in higher education.

Professional development programs for online teaching encompass a variety of formats and focuses (Powell & Bodur, 2019). Programs may be delivered in-person, online, or in hybrid formats, with content ranging from basic technical training to comprehensive instruction on pedagogy, accessibility, and student engagement. Among these options, structured programs that integrate theoretical frameworks with practical strategies have gained prominence, with many of these programs aiming to provide faculty with not only the tools to teach online but also the pedagogical foundations necessary to foster meaningful classroom interactions and equitable learning environments (Darling-Hammond et al., 2017; Garrison et al., 1999; Garrison & Arbaugh, 2007; Guilbaud et al., 2021). As described below, the type of professional development examined in this study was intended to provide such a comprehensive approach, making it highly relevant to ongoing discussions about effective faculty training (Bailey & Card, 2009; Scherer et al., 2021).

A small but growing number of studies have examined the potential impact of online teaching-focused professional development on faculty perceptions and behaviors (Borup & Evmenova, 2019; Dede et al., 2009, Xu et al., 2025). Research has shown that professional development participation often increases instructors' confidence in designing online courses, engaging students, and incorporating accessibility features (Brinkley-Etzkorn, 2018; Guilbaud et al., 2021; Richards & Thompson, 2023). Faculty trained in online teaching are more likely to adopt best practices such as using multimedia tools, facilitating collaborative learning, and creating equitable course environments (Bailey & Card, 2009). However, there is significant variation in the extent to which these practices are implemented (Leary et al., 2020), and instructors' implementation of online instructional skills and techniques taught in professional development may languish if insufficient follow-up support is offered (Brinkley-Etzkorn, 2020). While many instructors adopt practices such as accessibility tools and asynchronous interaction strategies, others underuse tools like video feedback, highlighting the uneven impact of professional development programs (Scherer et al., 2021). Mixed-methods research suggests that instructors who go through professional development do not always transfer skills learned in professional development programs to their subsequent teaching, resulting in limited impacts on student outcomes (Zhou et al., 2025). As detailed in the methods section, the professional development programs reviewed in this study provide practical opportunities to implement these skills in a real-world context, encouraging the subsequent transfer of these practices to future courses (Zhou et al., 2025).

Online Professional Development in California Community Colleges

California's community college system is the largest system of higher education in the United States, and the system has recognized the role of online courses in providing students with access to courses that provide flexibility in scheduling (California Community Colleges

Chancellor's Office, 2017). In California, statewide initiatives such as the California Virtual Campus-Online Education Initiative (CVC-OEI) and the Online Network of Educators (@ONE) program have been instrumental in providing structured professional development to enhance online teaching practices (California Virtual Campus-Online Education Initiative, 2020). The CVC-OEI, funded by the California Community Colleges Chancellor's Office, seeks to increase the number of students obtaining associate degrees and transferring to four-year institutions by expanding access to high-quality online courses and support services (Nguyen, 2017). These initiatives aim to improve course quality and accessibility, addressing the unique challenges faced by community college students in the online learning environment. As part of this effort, the CVC-OEI created an online course design rubric to provide colleges with guidelines around online teaching quality indicators such as accessibility, collaboration, and interaction strategies, reflecting institutional goals for online education (California Virtual Campus-Online Education Initiative, 2020).

Complementing this effort, the Online Network of Educators (@ONE) initiative, supported by the California Community Colleges Chancellor's Office, was established to equip California community college faculty with skills intended to improve online teaching effectiveness (Online Network of Educators, n.d.a.). @ONE provides training and resources specifically developed to help educators create online learning experiences that are accessible, student-centered, and effective (California Virtual Campus-Online Education Initiative, 2020). The @ONE program offers several foundational courses and workshops on topics such as online course design, accessibility, and equity (Online Network of Educators, n.d.b).

The programs offered by @ONE have also influenced the in-house professional development offered by California Community Colleges, including the programs featured in this paper. While some California Community Colleges lacked dedicated, in-house professional development in online learning pre-COVID, most colleges—including the two focal colleges in our study—had such programs in place (Hart et al., 2025), and the availability of such in-house programs may have expanded further given intensified efforts at training faculty during the pandemic (Hart et al., 2021b). Colleges' integration of these system-level initiatives has resulted in professional development programs that provide guidance that aligns with statewide standards, aiming to foster faculty proficiency in online instruction and enhance student success.

Research Questions

To better understand instructors' perceptions of how professional development shaped their online teaching experiences, and the extent to which the training exposed instructors to new skills, we ask the following questions:

1. What online teaching skills did faculty report receiving previous training in before participating in the focal online teaching professional development?
2. What practices do faculty report changing after participating in the focal online teaching professional development?
3. How has faculty confidence in their online teaching skills changed after participating in the focal online teaching professional development?

Below, we describe the training offered by the two colleges in our study, as well as the survey methods used to answer these questions.

Methods

Study Context

This study employed surveys to investigate instructor experiences with professional development for online instruction in two focal colleges: Saddleback College and Irvine Valley College. The professional development programs at Saddleback College and Irvine Valley College focused on strategies and skills that instructors can use to improve overall online course quality. Courses were facilitated by instructional designers and expert faculty with extensive online teaching experience. Both colleges delivered professional development in an asynchronous format, though the specific structure of training differed across campuses. Each college offered multiple versions of courses across the periods studied as course topics were refined over time and new courses were created. For instance, in 2019 and 2020, Irvine Valley College created the Canvas Challenge Camps. These were run for three days for each session, offering eight hours each day of facilitated learning based on the CVC-OEI Course Design Rubric. In the Challenge Camp, faculty were required to create a Canvas shell that aligned with this rubric, in order to obtain the Online Teaching Certificate. While Irvine Valley College also offered an earlier, asynchronous version of training with some overlap in topics, the vast majority of participants in our sample (described below) participated in the Challenge Camp version of professional development. Similarly, Saddleback offered several different asynchronous training programs, including a popular 8–10 week program that required up to 10 hours of engagement each week. Like Irvine Valley's, the Saddleback training was built to help faculty design courses aligned with the Course Design Rubric and required faculty to create Canvas shells aligned with the rubric in order to earn an Online Educator Certificate. While neither college mandated training, individual departments could require instructors to obtain training before being staffed in online classes.

The professional development curricula at both colleges were designed to align with the rubric designed by the CVC-OEI to guide online course quality, as well as @ONE training courses (Online Network of Educators, n.d.b). The CVC-OEI course design rubric provides a standardized framework for instructors to design online courses that foster accessibility, inclusivity, and engagement. Additionally, key components of the colleges' professional development programs were inspired by several @ONE courses, specifically "Introduction to Course Design," "Humanizing Online Teaching," "Assessment in Digital Learning," "10-10-10: Communication Matters," and "Introduction to Teaching with Canvas." Curricular elements inspired by these courses related to overall course design and focused on the principles of backward and universal design as they apply to online instruction. Using backward design techniques, professional development participants practiced beginning the design process with the course and unit-level objectives in mind, designing content specifically around meeting those objectives (Wiggins & McTighe, 2005). Concurrently, participants were exposed to basic concepts of universal design for learning that encourages the use of multiple means of student engagement, expression, and representation (CAST, 2024). Universal design for learning also places emphasis on accessibility for all students, particularly those with unique learning needs. These units were designed to help participants apply evidence-based design principles to create courses that are both accessible and pedagogically sound, focusing on clarity, structure, and engagement. For instance, participants learned how to establish a foundational course outline and design learning units with measurable outcomes.

Curricular elements related to humanizing instruction focused on creating a sense of community and fostering meaningful student interactions. Recognizing the importance of empathy and instructor presence, particularly for underserved students, training elements in this vein offered strategies for developing inclusive and supportive online learning environments by effectively communicating instructor presence, empathy, and support for students. Elements related to assessment in digital learning focused on how to create effective assessments. For example, participants at both colleges learned to apply the “assessment loop,” a framework for designing clear, equitable, and goal-aligned assessments that support student learning and engagement. The training guided participants in developing both formative and summative assessments that reflect the learning objectives and incorporate timely, meaningful feedback. Finally, curricular elements of the training focused on communication addressed the impact of first impressions and early interactions on student engagement and retention, emphasizing the importance of designing online courses that resonate with students within the first 10 minutes, 10 hours, and 10 days of instruction.

Survey Administration

To explore online instructors’ experiences with professional development for online teaching in these two colleges, we sent survey invitations to 207 potential participants who had completed professional development courses on online teaching at Irvine Valley College or Saddleback College, and who taught online in the colleges after fall 2016.² Participation in professional development was voluntary during this period, and our survey sample represents fewer than half of all faculty who taught online at the two colleges. The surveys were conducted in spring 2023 at Saddleback College and fall 2023 at Irvine Valley College.

We undertook several measures to provide potential respondents with clear information and boost participation rates. First, research partners associated with the offices that provided training at each college sent prenotification emails to potential participants. These prenotification emails provided information about the survey and included a link to a video in which research team members described the purpose of the study and what study participation would entail. About a week after the prenotification emails, we sent initial email invitations. We sent weekly reminders for five weeks until the survey closed to boost response rates (Cook et al., 2000). Respondents were offered a \$100 Amazon gift card for study participation, which included both survey completion and permission for the research team to access Canvas data for up to two courses that they taught; this Canvas data will be analyzed in future work. We ultimately received responses from 82 participants, a 39.6% response rate; this response rate is roughly in line with response rates typically reported for online surveys (Cook et al., 2000), including studies of faculty in higher education settings (Kaplowitz et al., 2012). Drawing from administrative data on instructor characteristics, we show that respondents and non-respondents were not significantly different from each other in terms of demographics, faculty type (e.g., full-time academic faculty, associated faculty), or experience (Appendix Table A1).

Survey questions incorporated information unique to each respondent. For instance, we asked respondents to answer questions with respect to a specific professional development training that college records showed they had taken. We also asked about instructional practices in a specific online class taught by each respondent that had been identified in

² The requirement that instructors teach after fall 2016 was due to our interest in collecting data from Canvas course shells, which we describe below; Canvas was adopted as the learning management system for both colleges in 2016.

administrative data as having been taught online between 2016 and 2019. This helped respondents focus on instructional practices in one class rather than more broadly changes that may have occurred in various classes, improving the internal consistency of responses.

Because we asked for information about a personalized set of courses—and in order to facilitate linking to administrative data for comparisons of participants to non-participants—Qualtrics survey links were personalized for each potential participant.

Survey Content and Measures

To understand the extent to which engagement in the professional development programs changed instructor practices and confidence in online teaching skills, we designed the survey to include five main blocks of questions: (1) instructors' teaching and professional development history, (2) course management practices before and after the focal professional development training, (3) confidence using various instructional strategies, (4) sources of information influencing practice, and (5) participant characteristics. These categories and the underlying questions (included in Appendix B) were developed based on a validated survey used to assess behavioral changes in a similar online professional development program (see Xu et al., 2025) and refined through consultation with leaders in distance education and professional development course instructors at the focal colleges.

Our tables and graphs present the share of respondents who endorsed different mutually exclusive responses to questions asked about teaching practices and confidence in online courses, as detailed below. In some cases, as described below, we combine categories where appropriate.

Prior Training and Professional Development History

To contextualize participants' backgrounds and the possible influence of prior professional development on confidence and changes in practice, respondents were asked about their history of taking professional development for online education. In addition, we confirmed that respondents recalled enrolling in the professional development program that focal college records indicated that they had completed and the term of completion. All respondents confirmed their participation in accordance with college records. We also asked whether respondents had received other professional development focused specifically on online pedagogy, aside from the focal professional development course, and where respondents had received prior training (e.g., other courses at the focal college, courses at other community colleges, courses through the @ONE program, etc.). For instructors who had taken other professional development, we also drilled down into the specific skills that they had received instruction on through other providers (e.g., organizing online course content, course pacing, etc.) We created a binary measure capturing whether respondents reported being trained in each area specifically for online instruction prior to the focal training.

Course Management Practices

We used several approaches to probe for information on participants' course practices in online instruction and how they may have changed as a result of professional development. To answer these questions, we asked that respondents consider a specific class that they had taught online between 2016 and 2019 according to administrative records. We included a question confirming with respondents that they had, in fact, taught the online class in

question; the vast majority reported having taught the course we asked about during that time frame. For the few respondents who had not taught the identified course online but had taught other online courses ($n = 3$), we asked them to choose one of those online courses to serve as the reference course for the following questions and to provide us with the course number. Similarly, if a respondent had not taught online during 2016–2019 ($n = 6$), we asked them to reference an online course taught in a different term and to report the course number and term. This approach ensured that all respondents focused on one concrete online course, even if it differed from the course identified in our records.

Key questions in this block asked respondents about when they first started using different recommended practices in online instruction: before taking the target professional development, within one year of the target professional development, more than one year after taking the professional development, or never. Sample practices included sending a welcome email prior to the start of the course; including specific grading criteria/rubrics for course assignments; and leaving video or voice feedback for students, which are considered best-practice strategies for high-quality online classes (Rovai, 2004; Jaggars et al., 2013) and are highlighted by the CVC-OEI Course Design Rubric (California Virtual Campus-Online Education Initiative, 2020). For each practice, we coded instructors' implementation timing based on whether they reported never having instituted the practice, having instituted it prior to the focal professional development program, or having instituted it after taking the focal professional development program (either within one year of the target professional development or more than one year afterwards).

We also asked whether participants' use of certain practices in online pedagogy increased, decreased, or stayed the same after taking the target professional development course. For instructors who did not report teaching online prior to professional development, we simply asked them whether they engaged in the sample practices of interest. Participants were also given the option to state they had never engaged in a particular practice. In this report, we focus only on results for faculty who taught online pre-professional development ($n = 48$) and who can therefore report meaningfully on changes in their practices.

We asked about changes in practices to two broad domains of online teaching skills: promoting student-to-student engagement in online courses and promoting student engagement with course content. Sample practices related to promoting student engagement with other students in the course included having students interact asynchronously with each other (e.g., via Canvas or iLearn discussions); having students interact synchronously with each other (e.g., over Zoom) and providing collaborative work for students. Sample practices related to student engagement with course content included providing formative assessments; asking students to reflect on their learning; providing tools such as closed captions or alt-text to improve the accessibility of the course; and providing lecture content through different formats such as video, audio (e.g., voice integrated with PowerPoint), slides without accompanying video or audio, and text only (e.g., written lecture notes).

For each practice, we grouped instructors into three categories: those whose use of a practice increased post-professional development, those whose use of a practice decreased post-professional development, and those whose use stayed the same. The latter category included those who never used the practice, since non-use both before and after professional development constitutes a lack of change in level of use.

Comfort and Confidence in Online Teaching

Our survey asked about instructors' changes in confidence after taking the professional development course in several domains. For instance, we asked about confidence executing different practices in Canvas or other Learning Management Systems to achieve course goals. Sample practices we asked about included building an online course, uploading course content, interacting with students, and recording grades in Canvas. We also asked about confidence in other specific domains of online pedagogy, such as facilitating meaningful student-student interaction, facilitating meaningful instructor-student interaction, providing an equitable online learning environment for all learners, designing a welcoming environment for students, etc. Respondents could report that their confidence increased, decreased, or stayed the same; or that they "did not do" the domain in question. Responses were dropped for instructors who reported that they "did not do" the domain in question, since analyzing changes in confidence did not make sense for respondents who did not use a particular pedagogical practice.

Influences on Online Teaching

In our final block of our questions on online teaching, we named several potential sources of influence on online teaching practices and asked respondents to rate how influential each had been for them personally. These questions were not analyzed for this study, but more detail on these question is available in Appendix B.

Participant Characteristics

The survey closed by requesting background information for each participant, including their age, gender identity, race/ethnic identity, and their highest degree earned.

Analytic Approach

We present results from the survey descriptively, using descriptive tables and bar graphs. Each item is analyzed separately; that is, we do not combine items to form scales. This is because items asked in the same question block were not necessarily expected to be correlated in predictable directions. For instance, we might expect training to increase some types of course practices (e.g., the use of self-recorded video to present course content) while decreasing others (e.g., use of static text to present course materials).

While the two colleges had separate professional development programs, many of the core topics overlapped (e.g., providing welcoming environments, facilitating interaction and collaboration in online classes) and they had qualitatively very similar patterns of findings. We therefore pool results from both colleges to improve clarity of presentation.

We present unweighted results in this paper. As a robustness test, we also generated a set of results that weighted responses by the calculated propensity to respond (using demographic characteristics, faculty type and experience variables drawn from administrative data that were available for both respondents and non-respondents; see Appendix Table A2). Those results were not qualitatively different from the unweighted estimates. We therefore present the unweighted estimates, with propensity-score weighted results available upon request.

Results

Of the 82 instructors who responded to the survey, nearly three quarters (73.1%) identified as female and about a quarter (25.0%) as male (Table 1). While the majority of instructors (73.1%) identified as White, 6.2% identified as Latina/o and 11.1% identified as one of several other race/ethnic groups (Asian, Black, Middle Eastern, Native American, and Hawaiian/Pacific Islander respondents) that were combined into a single category due to small cell sizes. Roughly half of respondents had only 1–5 years of experience teaching online (53.8%), and 46.2% had six or more years of experience teaching online. While just over a quarter of participants (26.3%) reported having taken no prior professional development specific to online instruction, the majority had taken some kind of professional development focused on online teaching prior to the focal training.

Table 1

Descriptive Statistics of Survey Sample

	%
Gender	
Female	73.1
Male	25.0
Prefer not to say	1.9
Race	
White	73.1
Latino/a	6.2
Other groups	11.1
Prefer not to say	0.7
Experience Teaching Online at Home College	
1–3 Years	26.9
4–5 Years	26.9
6–9 Years	32.7
10+ Years	13.4
Academic Year of Training	
2016–17	7.3
2017–18	17.1
2018–19	39.0
2019–20	20.7
2020–21	12.2
2021–22	3.7
Sources of Prior Professional Development	
Other at focal college	44.4
Through another provider	77.8
No other online-focused professional development	26.3
N (Respondents)	82

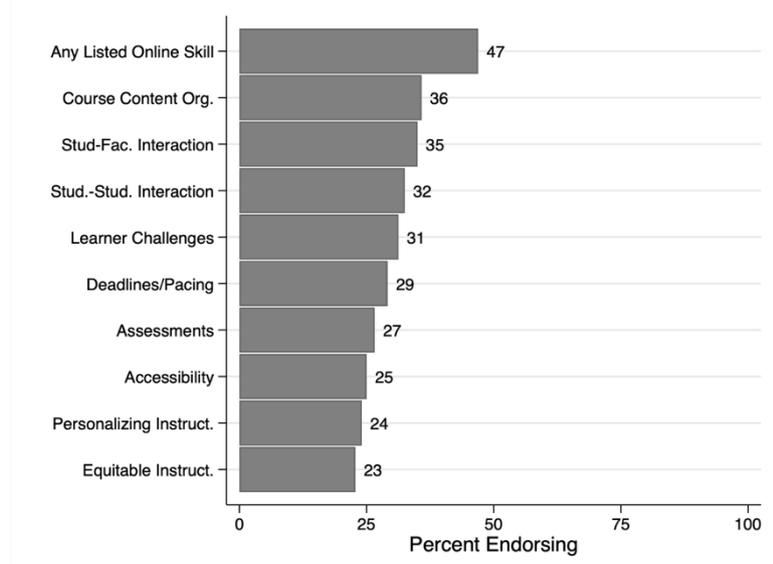
Note. Sources of other professional development are not mutually exclusive.

Faculty's Prior Training in Online Teaching

Figure 1 provides the types of skills respondents received training on prior to the focal professional development; respondents with no prior professional development related to online learning were presumed not to have been trained on the skills in question. Respondents reported having received prior training on a variety of online instruction topics, including course content organization (36%), interaction between students and faculty (35%) and among students (32%), learner challenges (31%), and deadlines/pacing practices (29%). We also aggregated responses into an indicator for whether respondents had training in any of the skills listed (top bar in Figure 1). Notably, there were no skills that a majority of respondents reported received training on through prior professional development. For some areas, such as accessibility and equitable instruction, no more than a quarter of respondents had received prior training in providing online instruction with respect to those areas. Nearly half of respondents (47%) reported no prior training in any of the skills listed. This suggests that there was considerable room for the professional development to introduce online instructors to new areas of skill that they had not previously been trained in.

Figure 1

Skills Learned in Prior Professional Development for Online Learning



Note. Respondents allowed to select multiple options. Respondents reporting no prior training are assumed not to be trained on each skill. Org. = Organization, Stud. = Student, Fac. = Faculty, Instruct = Instruction. “Any Listed Online Skill” bar is an indicator for whether respondents reported training in any of the listed skills.

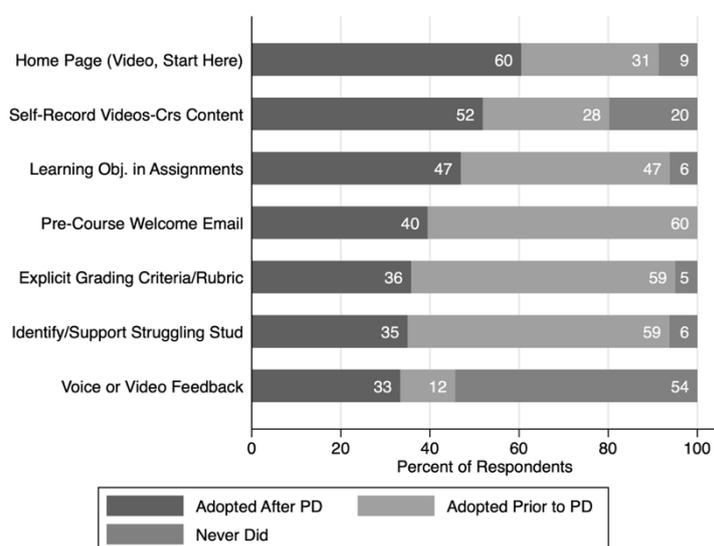
Changes in Teaching Practices after Professional Development

Consistent with our findings that participants reported that there were many areas in which they had not received prior training, we find that instructors report a notable uptake of many new activities introduced during training. Figure 2 reports results for timing of adoption of different online teaching practices. Three main takeaways emerge from the data. First, there were notable variations in online teaching practices that had already been adopted prior to training (as indicated by the lightest gray bars). While 59% of instructors had already adopted explicit grading criteria rubrics and 59% already identified and offered support to struggling students, only 12% used video or voice feedback prior to professional development training. Second, some practices increased substantially post-training, as

indicated in the darkest gray bars. These included the adoption of a course home page (60% adopting post-professional development) and the use of self-recorded videos to deliver course content (52% adopting post-professional development). Even practices that were relatively less commonly adopted after professional development, such as the use of voice or video feedback, were adopted by about a third of instructors. Finally, certain areas still showed room for increased adoption (as indicated by the medium-gray bars). For example, despite increased adoption post-professional development, 54% of instructors never used video or voice feedback, even after the professional development. These findings highlight how instructors' reported teaching practices changed following participation in the professional development programs, while also indicating areas for further enhancement.

Figure 2

Timing of Adoption of Different Instructional Practices



Note. Respondents chose one category within each instructional practice. Respondents reporting no prior training are assumed not to be trained on each skill. Crs = Course, Obj = Objectives.

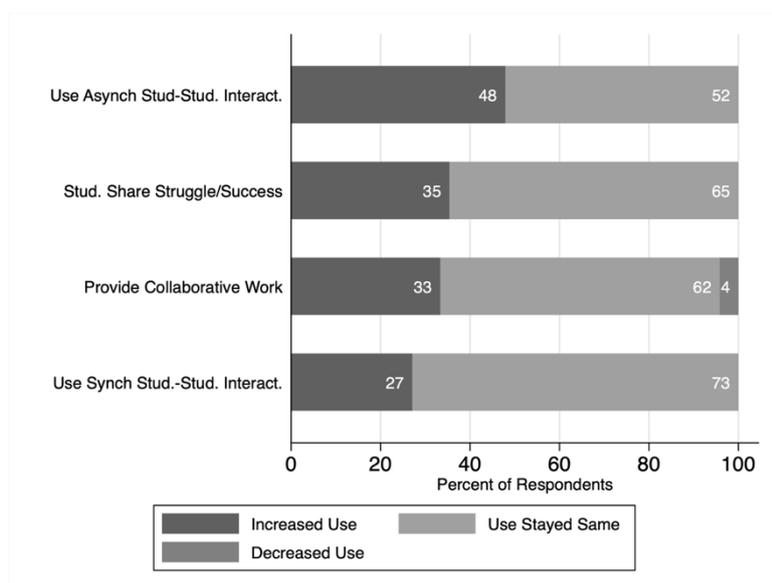
We further probed into the adoption of new practices by asking the 48 instructors who had taught online prior to taking the professional development whether they changed the extent to which they used different pedagogical strategies in courses, following the PD. Results regarding changes in practices to promote student interaction are reported in Figure 3. The darkest gray bars indicate the share of participants who increased their use of a given practice, while the lightest gray bars indicate the share whose use of a practice stayed the same. The medium gray bar indicates decreased use. The student interaction type that had the largest increase in use following professional development was asynchronous student interaction (48%), while about a third of the sample reported increases in the use of having students share their struggles with each other and in providing collaborative work.

In addition, instructors changed several other pedagogical practices related to the presentation of course content (shown in Figure 4). Most notably, a strong majority (70%) of instructors reported increasing their use of techniques to promote accessibility post-professional development (e.g., providing closed captions for video or attaching alt-text to images). Other pedagogical practices that increased included lectures through video and promoting student reflection (50% and 48%, respectively). Most instructors indicated that the

use of formative assessments; opportunities for student leadership; and the use of lectures via audio, PowerPoint slides, and text stayed the same after the professional development.

Figure 3

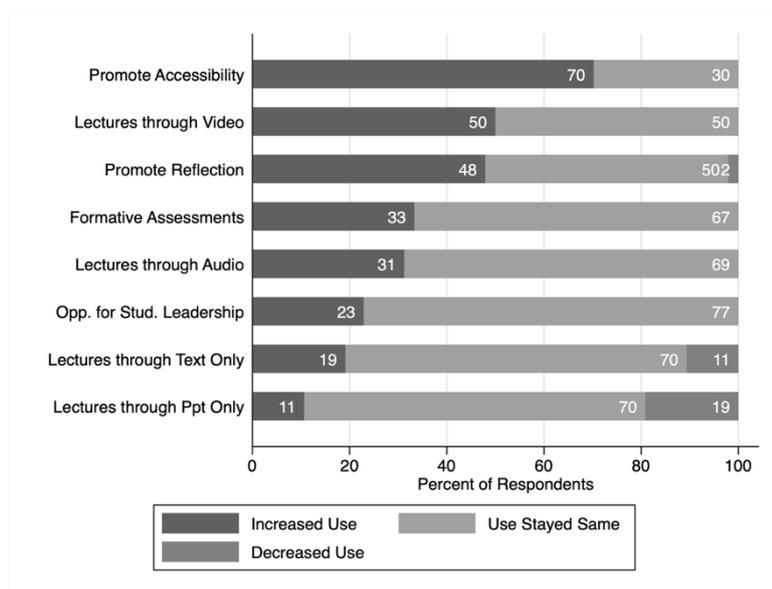
Changes in Student Interaction Practices Post-professional Development



Note. Respondents chose one category within each instructional practice. Asked among instructors who taught online pre-professional development ($n = 48$). Responses of “Don’t Do” were combined into “Use Stayed Same” category.

Figure 4

Changes in Course Content Practices Post-professional Development



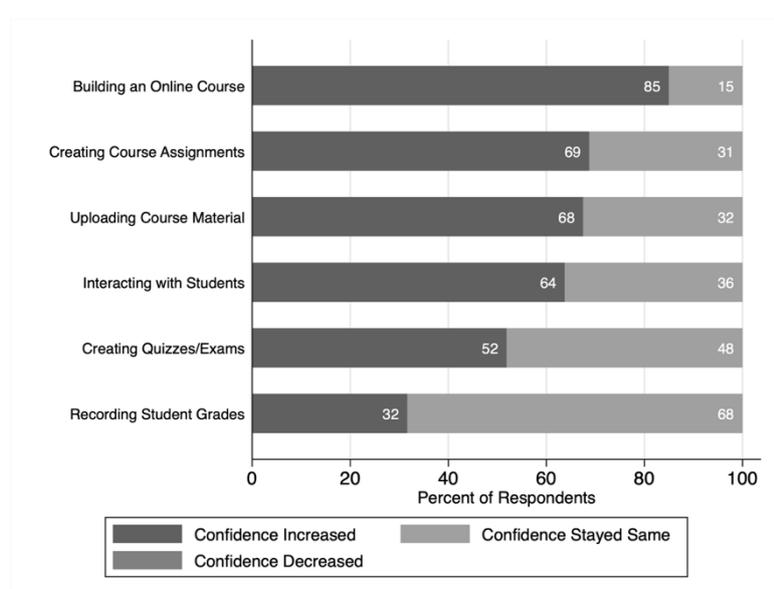
Note. Respondents chose one category within each instructional practice. Asked among instructors who taught online pre-professional development ($n = 48$). Responses of “Don’t Do” were included in “Use Stayed Same” category. Opp. = Opportunity, Stud. = Student, Ppt = PowerPoint.

Shifts in Confidence Across Online Teaching Skills after Professional Development

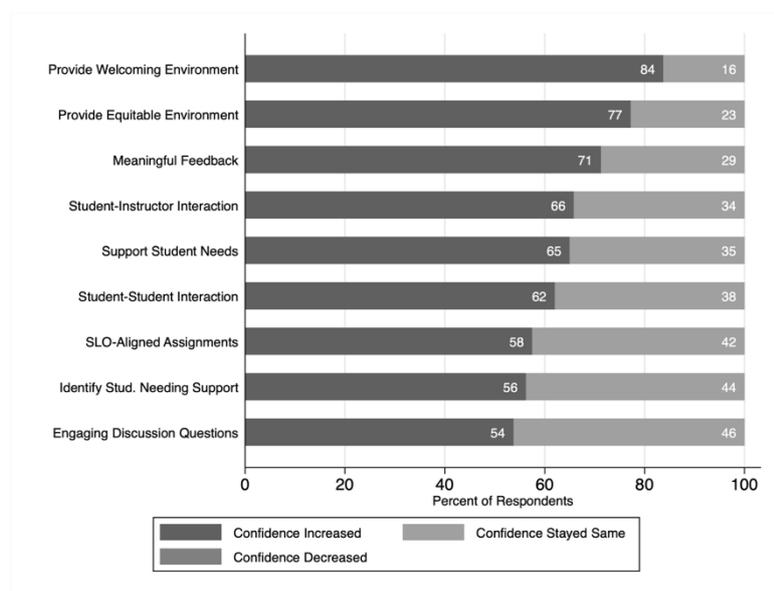
We find that instructors typically reported an increase in confidence in their online teaching skills in various domains post-professional development. The majority of instructors reported that professional development increased their confidence (indicated by the darkest gray bars) in five areas related to the technical side of using Canvas (Figure 5): building online courses (85%), creating course assignments (69%), uploading course materials (68%), interacting with students (64%), and creating quizzes/exams (52%). Similarly, large majorities of instructors reported increased confidence in skills related to domains related to student support, including providing both welcoming (84%) and equitable (77%) course environments, as well as providing meaningful feedback (71%) (Figure 6). While those three domains had especially strong increases in instructor confidence, it is notable that majorities reported improved confidence in skills related to student interaction and support across all domains featured in Figure 6. Taken together, Figures 5 and 6 strongly suggest that the professional development improved instructor confidence in skills important to online instruction.

Figure 5

Changes in Confidence with Online Practices Post-professional Development



Note. Respondents chose one category within each skill. We excluded responses of “Don’t Do,” since changes in confidence cannot be meaningfully assessed for practices that instructors reported never using. Note that while “Confidence Decreased” was an option, no participants selected it.

Figure 6*Changes in Confidence in Skills Post-professional Development*

Note. Respondents chose one category within each skill. Responses of “Don’t Do” ($n = 1$ for some answers) were excluded.

Discussion

Overall, these survey results underscore the role of professional development in shaping instructors’ online teaching confidence and practices. The professional development filled an important gap in training, as most instructors had not received formal training in many key pedagogical skills relevant to online instruction prior to the focal professional development. Our findings provide an important addition to other studies that have shown positive impacts of professional development on online instructors’ confidence and practices (Lewis & Abdul-Hamid, 2006; Brinkley-Etzkorn, 2018), as well as continued room for growth in particular instructional practices such as video feedback even post-professional development (Scherer et al., 2021).

Instructors reported improvements in their confidence and the adoption of various online teaching methods following professional development. This was particularly noted in the areas related to humanization of online courses (Pacansky-Brock et al., 2020), including respondents’ increased confidence in their ability to provide welcoming and equitable online learning environments. This was also reflected in a reported change in practices, as a strong majority of professional development participants reported adopting practices to improve accessibility of their online courses, as well as incorporating practices to improve student engagement in classes (e.g., use of video lectures and promoting student reflection) and interaction with other students (e.g., using new approaches to student interaction, encouraging students to share struggles). Such changes to course practices to improve interaction, organization, and engagement have long been identified as important elements of online teaching (Garrison et al., 1999; Garrison & Arbaugh, 2007; Jaggars et al., 2013; Rovai, 2004; Shea & Bidjerano, 2010).

Design elements within the professional development curriculum that encouraged engagement with peers and instructors, and the sharing of personal experiences may have contributed to this increased confidence by increasing engagement (Darling-Hammond et al., 2017; Sentance & Humphreys, 2018). Prior research suggests that institutional policies that encourage collaborative learning and the sharing of best practices among faculty after professional development may help reinforce and sustain changes in teaching practice (Lave & Wenger, 1991; Sentance & Humphreys, 2018). Institutions may consider fostering a culture of collaboration and providing platforms for instructors to connect and learn from each other through formal and informal communities of practice. Looking at these avenues to sustain improvements in practice made after PD is an important area for future work.

Conclusions and Limitations

Our study makes several key contributions to the literature. First, much of the existing research has been conducted at four-year institutions (e.g., Brinkley-Etzkorn, 2018, 2020; Borup & Evmenova, 2019; Jarvie-Eggart et al., 2023), with limited attention to community colleges (but see Zhou, Li, & Xu, 2025). This is a significant gap given the critical role community colleges play in serving diverse and nontraditional student populations, who often face greater challenges in online learning environments. Community colleges operate under unique resource constraints and often have different institutional priorities, making it essential to understand how professional development functions in these settings. Our study focuses explicitly on community colleges, examining structured professional development programs at two institutions in Southern California. By exploring how faculty report changes to their teaching practices as a result of professional development in these contexts, we contribute to the understanding of professional development in resource-constrained settings.

Second, many studies rely on small sample sizes, which limits their generalizability. For example, many studies rely on qualitative data, which provides rich detail and nuance but generally allows for fewer participants (e.g., <30; see Borup & Evmenova, 2019; Brinkley-Etzkorn, 2018, 2020). Prior studies often include only a handful of faculty from a single institution, reducing their ability to capture variations in faculty experiences or outcomes. Our study surveys 82 faculty members across a variety of departments at two community colleges, which allows us to capture meaningful variation in faculty experiences and outcomes, providing a stronger empirical foundation for understanding how professional development influences online teaching practices for instructors from different backgrounds.

Finally, our study design allows us to look at specific pedagogical practices and examine pre- and post-professional development adoption rates. The use of surveys to collect this rich data provides a detailed and actionable understanding of how professional development influences teaching practices, highlighting areas where faculty have made significant changes and where further support may be needed.

We note that while this survey provides valuable insights into how instructors' approaches to online teaching have evolved, the direct impact of professional development training on student outcomes remains largely unknown. Our study is limited by the use of instructors' self-reported changes in practice. Future research should consider using more objective measures, such as course observations or learning-management-system clickstream data, to measure behavioral changes. Additionally, an important avenue for future research lies in examining whether the changes in instructors' beliefs and practices resulting from professional development programs translate into improved student performance and reduced equity gaps in online coursework.

Additionally, we note that these findings come from two colleges with particularly extensive professional development around online learning, representing dozens of hours of engagement. It is uncertain whether similar results would be achieved with more cursory approaches to professional development; future work should examine how variability in implementation of professional development is associated with differences in instructor responses. Moreover, while our sample size is larger than in many past studies, future work should look at larger samples across a wider range of institutions to be able to better capture generalizable trends associated with professional development in online learning.

Finally, the skills covered in the professional development offered by our two focal colleges represent specific approaches to quality online teaching favored by the California Virtual Campus-Online Education Initiative (CVC-OEI) and Online Network of Educators (@ONE). While these approaches are commonly used in California Community Colleges, they may not align perfectly with approaches and professional development offered by national organizations such as Quality Matters (Quality Matters, n.d.) and the Online Learning Consortium (Online Learning Consortium, n.d.), or with independently validated measures of online teaching effectiveness (e.g., Jaggars & Xu, 2016; Xu et al., 2020). Looking at experiences and evaluations by participants in professional development offered by national organizations may offer one promising avenue for future work. In addition, more exploration of how PD has changed post-pandemic—and how impacts of PD on instructor practices have changed post-pandemic—are both important areas for future research.

As online learning continues to expand in postsecondary institutions post-COVID, questions around how to improve student outcomes in online courses will likely become increasingly pressing. Our work suggests that professional development may serve as one avenue to improve faculty practices and comfort with online teaching.

Declarations

Acknowledgements

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Ethics Board Approval

This study was conducted with approval by the University of California, Irvine IRB (#412) and the University of California, Davis IRB (#1771808-3).

Conflicts of Interest

Authors Kim d'Arcy, Cheryl Bailey, Tim VanNorman, Vivian Nguyen, and Jennifer Pakula are employees of the colleges where the study was conducted, with work connected to the professional development programs described here.

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Appendix A

Statistics Tables

Appendix Table A1

Descriptive Statistics of Survey Non-Respondents vs. Respondents

	Non-Respondents		Respondents		P-value, Diff
	Mean	N	Mean	N	
College					
College 1	0.656	125	0.646	82	0.887
College 2	0.344	125	0.354	82	0.887
Instructor Demographics					
Employee Female	0.706	119	0.744	82	0.557
White	0.629	124	0.683	82	0.430
Asian/Pacific Islander	0.161	124	0.110	82	0.300
Hispanic	0.145	124	0.085	82	0.200
Other Race/Ethnic Group	0.065	124	0.122	82	0.155
Instructor Type					
Academic Faculty: Full-Time	0.303	119	0.378	82	0.267
Associate Faculty	0.697	119	0.610	82	0.198
Classified and Admin.	0.000	119	0.012	82	0.229
Years of Experience (All Modalities)					
Years Experience: <5	0.200	125	0.122	82	0.144
Years Experience: 5–10	0.416	125	0.476	82	0.401
Years Experience: >10	0.384	125	0.402	82	0.792
N (Unique Faculty)	207				

Note. Authors' calculations from administrative data. Mismatches in demographics compared to Table 1 arise from differences in reporting across data sources. One observation/faculty member selected, in term of survey or nearest prior term.

Appendix Table A2*Propensity to Respond*

	b (se)
College 2	0.021 (0.075)
Instructor Demographics	
Employee Female	0.061 (0.078)
Asian/Pacific Islander	-0.113 (0.102)
Hispanic	-0.150 (0.111)
Other Race/Ethnic Group	0.156 (0.131)
Associate Faculty	-0.079 (0.077)
Years Experience, All Modalities	
Years Experience: <5	-0.071 (0.111)
Years Experience: 5–10	0.025 (0.080)
Constant	0.429*** (0.093)
Observations	201

Source. Author's calculation from colleges' administrative data. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Coefficient (standard error). Classified staff grouped in omitted category with Academic Full-Time faculty because classified status predicted response perfectly.

Appendix B

Survey Instrument

Note: All respondents provided consent before starting the survey below. Text in {brackets} was piped in to reflect the college, course, PD training, etc. relevant to each participant.

Block 1: Teaching, Training, and Professional Development History

The following questions ask about your teaching experience, both in general and online.

Q1. Which of the following types of institutions have you taught in during your career? Include both teaching done both online and face-to-face. Exclude any teaching done as a graduate student assistant or TA. (Please check all that apply.)

- {Partner College}
- Other college in {Partner College}'s District
- Other college in California Community College (CCC) system
- Other colleges outside of the CCC system
- Schools at another level of education (not college)

Carry Forward Selected Choices from “Which of the following types of institutions have you taught in during your career? Include both teaching done both online and face-to-face. Exclude any teaching done as a graduate student assistant or TA. (Please check all that apply.)”

Q2. In which of the following types of institutions have you taught **online** during your career? Exclude any teaching done as a graduate student assistant or TA. (Please check all that apply.)

- {Partner College}
- Other college in {Partner College}'s District
- Other college in California Community College (CCC) system
- Other colleges outside of the CCC system
- Schools at another level of education (not college)

Q3. For roughly how many years have you taught at {Partner College}? Choose the response that applies best, including teaching done online AND face-to-face. Exclude any teaching done as a graduate teaching assistant. Choose the response that applies best.

- 1 (first year teaching)
- 2-3 years
- 4-5
- 6-10
- 10-15
- 16 or more

Display this question:

If In which of the following types of institutions have you taught online during your career? Exclud... {Partner College} Is Selected

Q4. For roughly how many years have you taught **online** at {Partner College}? Choose the response that applies best for online teaching specifically.

- 1 (first year teaching)
- 2-3 years
- 4-5
- 6-10
- 10-15
- 16 or more

Display this question:

If Which of the following types of institutions have you taught in during your career? Include both... = Other college in {Partner College}'s District

Or Which of the following types of institutions have you taught in during your career? Include both... = Other college in California Community College (CCC) system

Or Which of the following types of institutions have you taught in during your career? Include both... = Other colleges outside of the CCC system

Q5. For roughly how many years have you taught at the college level (including both online and face-to-face classes)? Please consider your experience in ALL institutions (including {Partner College}). Exclude any teaching done as a graduate teaching assistant. Choose the response that applies best.

- 1 (first year teaching)
- 2-3
- 4-5
- 6-10
- 10-15
- 16 or more

Display this question:

If In which of the following types of institutions have you taught online during your career? Exclud... Other college in {Partner College}'s District Is Selected

Or Or In which of the following types of institutions have you taught online during your career? Exclud... Other college in California Community College (CCC) system Is Selected

Or Or In which of the following types of institutions have you taught online during your career? Exclud... Other colleges outside of the CCC system Is Selected

Q6. For roughly how many years have you taught **online** at the college level (including both online and face-to-face classes)? Please consider your experience in ALL institutions (including {Partner College}). Exclude any teaching done as a graduate teaching assistant. Choose the response that applies best.

- 1 (first year teaching)
- 2-3
- 4-5
- 6-10
- 10-15
- 16 or more

The following questions ask about your past experiences with professional development (PD) **for online teaching specifically**.

Q7. {Partner College} records indicate that you completed the {PD Name} in {PD Completion Term}. Is this correct? (Choose one).

- Yes, that is correct
- No, I never completed {PD Name}
- No, I completed {PD Name} at a different time

Display this question:

If {Partner College} records indicate that you completed the {PD Name} in ... = No, I completed {PD Name} at a different time

Q8. To the best of your memory, when did you complete {PD Name}?

Q9. **Before you** completed the {PD Name} course at {Partner College}, had you taught any online courses? (Select the answer that applies best.)

- No, I had not taught online prior to completing the {PD Name} course

- Yes, I had taught online before completing the {PD Name} course
- I was teaching online for the first time during the term I completed the {PD Name} course

Display this question:

If Before you completed the {PD Name} course at {Partner College}, had you taught... = Yes, I had taught online before completing the {PD Name} course

Q10. Where had you taught online **before completing** the {PD Name} course? (Select all that apply.)

- {Partner College}
- Other college in {Partner College}'s district
- Other California Community College (CCC)
- Other colleges outside of the CCC system
- Schools at another level of education (not college)

Q11. Have you ever taken any other professional development course specifically **focused on online teaching skills** aside from the {PD Name} course?

No

- Yes, through {Partner College}
- Yes, through another California Community College
- Yes, through @ONE (California Virtual College-Online Education Initiative)
- Yes, through another provider
- Not sure

Display this question:

If Have you ever taken any other professional development course specifically focused on online teaching... != No

Q12. We are interested in whether/when instructors may have received training in the following areas **for online teaching** from other professional development courses besides {PD Name}. Please select all that apply for each skill listed.

	Other Training Prior to {PD Name}	Other Training While Taking {PD Name}	Other Training After {PD Name}	No Training Outside of {PD Name}
Learner challenges in online courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organizing course content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deadlines/pacing assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student-student interaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student-instructor interaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing valid assessments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility for students with disabilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personalizing student learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Equitable
instruction



Block 2: Course Management Practices

Q13. The next set of questions will ask about a number of different practices that you use in instruction. {Partner College} records show that you taught {Class Name} online at least once between 2016-2019. Is this correct?

- Correct
- Incorrect. I taught online during that period, but it was a *different* class
- Incorrect, I did not teach any classes online during that period

Display this question:

If The next set of questions will ask about a number of different practices that you use in instruct... = Incorrect. I taught online during that period, but it was a different class

Q14. Thank you for letting us know. We would like you to answer the following questions with respect to a course that you taught online from 2016-2019. Could you please specify a course that you taught online that you will keep in mind for the following questions? (You can provide a course name or number, e.g., “Bio 101” or “Introduction to Biology”). Please consider this course in the following questions instead of {Class Name}, even though the prompts will refer to {Class Name}.

Display this question:

If The next set of questions will ask about a number of different practices that you use in instruct... = Incorrect, I did not teach any classes online during that period

Q15. Thank you for letting us know. We would like you to answer the following questions with respect to a course that you taught online at some point. Could you please specify a course that you taught online that you will keep in mind for the following questions? (You can provide a course name or number, e.g., “Bio 101” or “Introduction to Biology”). Please consider this course in the following questions instead of {Class Name}, even though the prompts will refer to {Class Name}.

Display this question:

If The next set of questions will ask about a number of different practices that you use in instruct... = Incorrect, I did not teach any classes online during that period

Q16. Please list at least one academic term when you taught that course.

Q17. Consider your {Class Name} course. The **first time you taught the course online**, did you build the site for the course in Canvas (or the equivalent learning management system), or did you build off of a pre-existing course site offered or shared by a publisher or another instructor?

- Built the course shell entirely myself
- A pre-existing course was shared with me and I used that course site with little alteration
- A pre-existing course was shared with me and I customized the course content substantially
- I did not use a learning management system the first time I taught the course online

Q18. Consider your {Class Name} course. When would you say you **first** used the following practices in online sections of this course? (Choose best answer for each row).

	Prior to Starting {PD Name}	Within 1 Year of Taking {PD Name}	More than 1 Year after Taking {PD Name}	I Have Never Done This
Sending a welcome email to students prior to the start of the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using a course homepage with a brief video or photo of me and a clear “start here” cue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Including learning objectives for course assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing explicit grading criteria (e.g., a rubric) for course assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identifying struggling students and proactively providing additional support (e.g., study tips, advice, encouragement, referrals to tutoring)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating self-recorded videos to introduce new content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leaving voice or video feedback for students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display this question:

If Before you completed the {PD Name} course at {Partner College}, had you taught... = Yes, I had taught online before completing the {PD Name} course

Or Before you completed the {PD Name} course at {Partner College}, had you taught... = I was teaching online for the first time during the term I completed the {PD Name} course

Q19. We are interested in your instructional practices in structuring student engagement with other students in your online {Class Name} course. Did your use of each practice listed in your online courses increase, decrease, or stay the same after you took {PD Name}? (Choose the best answer for each row).

	Increased	Decreased	Stayed the same	I don't do this
Providing collaborative work (e.g., group assignments, peer review)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Having students interact asynchronously with each other (e.g., Canvas/iLearn discussions, Flipgrid, VoiceThread, Google Docs, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having students interact synchronously with each other (e.g., Zoom, Skype or video conferencing tools)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having students share their struggles and successes with each other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display this question:

If Before you completed the {PD Name} course at {Partner College}, had you taught... = No, I had not taught online prior to completing the {PD Name} course

Q20. We are interested in your instructional practices in structuring student engagement with other students in your online {Class Name} course. Which of the practices below do you use in your online courses? (Choose all that apply.)

- Providing collaborative work (e.g., group assignments, peer review)
- Having your students interact asynchronously with each other (e.g., Canvas/iLearn discussions, Flipgrid, VoiceThread, Google Docs, etc.)
- Having students interact synchronously with each other (e.g., Zoom, Skype or video conferencing tools)
- Having students share their struggles and successes with each other

Display this question:

If Before you completed the {PD Name} course at {Partner College}, had you taught... = Yes, I had taught online before completing the {PD Name} course

Or Before you completed the {PD Name} course at {Partner College}, had you taught... = I was teaching online for the first time during the term I completed the {PD Name} course

Q21. We are interested in your instructional practices in structuring student engagement with course content in your online {Class Name} course. Did your use of each instructional practice listed in your online courses increase, decrease, or stay the same after you took {PD Name}? (Choose the best answer for each row).

	Increased	Decreased	Stayed the Same	I Don't Do This
Providing formative assessments (e.g., quizzes, problem-sets, other assignments)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asking students to reflect on their	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

learning (e.g., on their personal learning goals, on their study strategies, on their progress)				
Providing opportunities for students to take leadership in the learning process (e.g., teaching others, choosing topics of interest, guiding the direction of the coursework)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing lectures through video (e.g., videos of yourself solving problems/lecturing)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing lectures through audio (e.g., voice integrated within PowerPoint slides, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing lecture content through PowerPoint slides only (no accompanying videos or audio)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing lecture content through text only (e.g., written lecture notes, pdf, etc., without accompanying videos or audio)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing closed captions, writing alt-text and other tools to improve the accessibility of content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display this question:
If Before you completed the {PD Name} course at {Partner College}, had you taught... = No, I had not taught online prior to completing the {PD Name} course

Q22. We are interested in your instructional practices in structuring student engagement with course content in your online {Class Name} course after taking {PD Name}. Which of the practices below do you use in your online courses? (Choose all that apply.)

- Providing formative assessments (e.g., quizzes, problem-sets, other assignments)

- Asking students to reflect on their learning (e.g., on their personal learning goals, on their study strategies, on their progress)
- Providing opportunities for students to take leadership in the learning process (e.g., teaching others, choosing topics of interest, guiding the direction of the coursework)
- Providing lectures through video (e.g., videos of yourself solving problems/lecturing)
- Providing lectures through audio (e.g., voice integrated within PowerPoint slides, etc.)
- Providing lecture content through PowerPoint slides only (no accompanying videos or audio)
- Providing lecture content through text only (e.g., written lecture notes, pdf, etc., without accompanying videos or audio)
- Providing closed captions, writing alt-text and other tools to improve the accessibility of content

Block 3: Comfort and Confidence in Online Teaching

Q23. In this question, we ask about changes in your confidence using Canvas or other Learning Management Systems (LMS) for particular course goals. Did your confidence in the following areas increase, decrease, or stay the same after you took {PD Name}? (Choose the best answer for each row).

	Increased	Decreased	Stayed the same	I don't do this
Building an online course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uploading course material	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating course assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interacting with students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating quizzes and exams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recording student grades	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q24. In this question, we ask about changes in your confidence in the following domains of online teaching. Did your confidence in the following areas increase, decrease, or stay the same after you took {PD Name}? (Choose the best answer for each row).

	Increased	Decreased	Stayed the same	I don't do this
Facilitating meaningful student-student interaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilitating meaningful instructor-student interaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing discussion questions that promote engagement with course content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Designing course assignments aligned with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

student learning objectives					
Providing meaningful feedback for students	<input type="radio"/>				
Providing an equitable online learning environment for all learners	<input type="radio"/>				
Supporting the needs of individual students	<input type="radio"/>				
Identifying individual students who could benefit from extra support	<input type="radio"/>				
Designing a welcoming environment for students	<input type="radio"/>				

Block 4: Influences on Online Teaching

Q25. How influential have the following been in affecting your online teaching practices in general? (We ask separately about your experiences during COVID in the next question.) (Please choose one answer in each row.)

	Highly Influential	Somewhat Influential	Slightly Influential	Not Influential	Have Not Done This
{PD Name}	<input type="radio"/>				
Other PD at {Partner College}	<input type="radio"/>				
Other PD outside of {Partner College}	<input type="radio"/>				
Collaboration with Colleagues	<input type="radio"/>				
Professional Learning Communities	<input type="radio"/>				
My Own Trial and Error	<input type="radio"/>				

Q26. How influential have the following been in affecting your online teaching practices **during COVID** specifically?

	Highly Influential	Somewhat Influential	Slightly Influential	Not Influential	Have Not Done This
{PD Name}	<input type="radio"/>				
Other PD at {Partner College}	<input type="radio"/>				
Other PD outside of {Partner College}	<input type="radio"/>				
Collaboration with Colleagues	<input type="radio"/>				
Professional Learning Communities	<input type="radio"/>				
My Own Trial and Error	<input type="radio"/>				

Display this question:

If How influential have the following been in affecting your online teaching practices in general? (... = Other PD at {Partner College} [Highly Influential]

Or How influential have the following been in affecting your online teaching practices in general? (... = Other PD at {Partner College} [Somewhat Influential]

Or How influential have the following been in affecting your online teaching practices in general? (... = Other PD at {Partner College} [Slightly Influential]

Or How influential have the following been in affecting your online teaching practices in general? (... = Other PD at {Partner College} [Not Influential]

Or How influential have the following been in affecting your online teaching practices in general? (... = Other PD outside of {Partner College} [Highly Influential]

Or How influential have the following been in affecting your online teaching practices in general? (... = Other PD outside of {Partner College} [Somewhat Influential]

Or How influential have the following been in affecting your online teaching practices in general? (... = Other PD outside of {Partner College} [Slightly Influential]

Or How influential have the following been in affecting your online teaching practices in general? (... = Other PD outside of {Partner College} [Not Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD at {Partner College} [Highly Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD at {Partner College} [Somewhat Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD at {Partner College} [Slightly Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD at {Partner College} [Not Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD outside of {Partner College} [Highly Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD outside of {Partner College} [Somewhat Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD outside of {Partner College} [Slightly Influential]

Or How influential have the following been in affecting your online teaching practices during COVID... = Other PD outside of {Partner College} [Not Influential]

Q27. Your response indicated you had an “other” PD experience that you considered above. Please let us know which “other” PD you had in mind.

Block 5: Participant Characteristics

Q28. Which range below best describes your age?

- 22-25
- 26-30
- 31-45
- 46-55
- 56+
- Prefer not to say

Q29. What is your gender identity?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

Q30. What is your racial/ethnic identity? Check all that apply.

- American Indian/Alaskan Native
- Asian (e.g., East Asian, Southeast Asian, South Asian)
- Black (e.g., African American, African, Caribbean)
- Latino/a (e.g., Mexican or Chicano, Puerto Rican, Central or South American)
- Middle Eastern
- Native Hawaiian/Pacific Islander
- White
- Other
- Prefer not to say

Q31. What is your highest degree earned?

- Professional degree (e.g., M.D., D.D.S., J.D., D.V.M.)
- Doctoral degree (e.g., Ph.D., Ed.D.)
- Master's degree
- Bachelor's degree
- Other

Q32. Is there anything you else you would like us to know with respect to how your professional development experiences prepared you for online teaching?

Display this question:

If {Partner College} records indicate that you completed the {PD Name} in ... = Yes, that is correct

Or {Partner College} records indicate that you completed the {PD Name} in ... = No, I completed {PD Name} at a different time

Q33. We may conduct additional interviews to learn more about participants' experiences in the {PD Name} Interviews would likely be conducted in the spring semester. Would you be willing for us to contact you about additional interview opportunities? (Answering yes does not obligate you to participate; it just allows us to contact you with more information.)

- Yes

- No

Display this question:

If We may conduct additional interviews to learn more about participants' experiences in the ... = Yes

Q34. Thank you. If we conduct additional interviews, we will contact you at that time.

Q35. Would you like to receive updates about the results of this study?

- Yes
- No