

Consortium for Healthcare Education Online

Faculty Development Brief

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RUTGERS

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Research Center

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SMLR was originally established by an act of the New Jersey legislature in 1947 as the Institute of Management and Labor Relations (IMLR). Like its counterparts that were created in the other large industrial states at the same time, the Institute was chartered to promote new forms of labor-management cooperation following the industrial unrest at the end of World War II. It officially became a school at the flagship campus of the State University of New Jersey in New Brunswick/Piscataway in 1994. For more information, visit smlr.rutgers.edu.

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BACKGROUND

The Consortium for Healthcare Education Online (CHEO) is a United States Department of Labor (USDOL) Trade Adjustment Assistance Community College and Career Training (TAACCCT) funded grant project intended to develop new or redesigned online and hybrid courses leading to credentials in health care fields in high demand across the West and Midwest. CHEO is an interstate consortium consisting of eight colleges across Colorado, Wyoming, South Dakota, Montana, and Alaska. The consortium includes: Pueblo Community College (PCC), Otero Junior College (OJC), Red Rocks Community College (RRCC), Laramie County Community College (LCCC), Lake Area Technical College (LATI), Great Falls College Montana State University (GFC MSU), Flathead Valley Community College (FVCC), and Kodiak College (KoC).

METHODOLOGY/DATA SOURCES

This report examines the change, or resistance to change, over time of CHEO-affiliated faculty to new online and hybrid pedagogies. This report utilizes a largely qualitative methodology derived from an online survey of CHEO-affiliated faculty that was distributed to faculty in August, 2015 and on-site and phone interviews conduct by EERC staff members with CHEO-affiliated faculty, project leads and instructional designers across the grant period. Where quantitative information is presented, it is derived from the online survey results.

Most interviews were taped and transcribed; non-taped interviews involved extensive note taking. These transcriptions and notes as well as the documents cited above have been coded through the use of NVivo qualitative data management software and analyzed by EERC team members to identify key themes and paths by which faculty perception and practice changed, or resisted change, around new online and hybrid pedagogies.

The academic literature on teaching with technology and online learning was consulted to identify key variables or themes that previous research identified as important. These variables, as well as previously collected qualitative data, were used to construct the online faculty survey questions. They were also used as an analytical frame for categorizing the interview data.

INTRODUCTION

This report examines the change over time in faculty practice and perception of online and hybrid teaching technologies through the CHEO grant. A primary purpose of the CHEO grant was to assist each of the eight college consortium members with transitioning identified allied healthcare courses and programs into hybrid and/or online formats, as well as incorporating Open Education Resources (OER) — free, public learning resources or program support materials — into their courses. These changes were intended to allow those schools to better serve rural and adult learners who may struggle to access campus locations routinely as required by traditional course delivery. Specifically, this report addresses whether

(1) change over time occurred relative to faculty perceptions and practice regarding online/hybrid teaching and (2) what elements (variables) led to this change if it occurred. Overall, the literature identifies five main categories of variables as important to pedagogical shifts in practice and belief, and sustainability of online educational initiatives:

1. Collaboration with peers (Lackey, 2011; McGill, Klobas & Renzi, 2014; Gunn, 2010)
2. Institutional support of online teaching initiatives (Baran & Correia, 2014; Gunn, 2010)
3. Faculty efficacy and perceived ease of use (Ajjan & Hartshorne, 2008)
4. Perception of superiors, peers and students attitudes toward online education (Ajjan & Hartshorne, 2008)
5. Training both in technological use and instructional design (Mitchell & Geva-May, 2009; Baran & Correia, 2014)

There is significant qualitative evidence that these forces were important to adoption of online teaching technologies by CHEO faculty. There is also significant evidence that the CHEO grant was instrumental in helping to generate the pre-conditions for success. It facilitated collaboration across faculty and institutions; formalized institutional support for online teaching especially in schools who had not previously prioritized it and also developed training opportunities for faculty.

ADOPTING ONLINE PEDAGOGY

As mentioned above, a primary goal of the CHEO grant was to transition specific healthcare courses and programs into hybrid and/or online formats, and to incorporate OER into curriculum. The nature of these changes impacted faculty teaching CHEO healthcare courses and required extensive cooperation and collaboration from them as they engaged in course development and redesign. Faculty experience with online and/or hybrid formats varied considerably across the consortium prior to the grant. Likewise, pre-existing attitudes about these learning platforms also varied across programs and colleges.

Over half of faculty survey respondents, 62 percent (N=18) had previous experience with teaching online. That experience was quite varied; for some faculty it amounted to grading students' at-home lab reports electronically, while others had extensive experience in learning management systems such as BlackBoard and characterized themselves as "early adopters." On the other hand, 38 percent (N=11) of faculty respondents had no online teaching experience prior to the CHEO grant. One instructor described her experience as a "maiden voyage."

Changes in Perception

To measure whether or not change over time occurred with regards to online pedagogies in CHEO-affiliated faculty, we first present pre-CHEO attitudes of these faculty toward online teaching. Before CHEO, 51 percent of survey respondents (N=15) expressed some sense of positivity or identified some benefit that might be derived from online teaching.

Faculty members with experience teaching online before the CHEO grant were slightly more likely to report some positivity or identified some benefit to online teaching as the general population (58 percent). Some faculty had experience on both sides of the screen – teaching and learning online:

I have always been a big proponent actually. I did my master's program online and it was a little bit scary for me but then I got more comfortable. I think online learning gives a lot more opportunities for a lot more students. I am all about it. I think it is great! I think every program should offer it.

Those that were positive were not necessarily unequivocal; there was still some concern whether online teaching was appropriate for all subject matters. For example, one faculty member characterized online teaching as “the wave of now and the future,” but expressed concern that “that it would be tough to teach a “soft” course like hospice online or hybrid.”

For those faculty members that expressed negative impressions of online teaching, they largely felt that online education wouldn't work for their *particular subject*, not necessarily that it was unsuitable for *all education*. This seemed to be true particularly for hard science courses, especially those with lab components. For example, several faculty members stated that “before my CHEO experience I believed that online teaching [wouldn't] work for lab-based classes” or “that it [online teaching] would be difficult to do in science courses and that labs should be [done] in class.” Another faculty member expressed that “I thought that you could transition some stuff, but I thought ‘how you are going to get the kind of level of engagement that you get with a face-to-face [class]?’ That was my main concern because it just seemed like more of a disconnect.”

The ability to engage students and interact with them enough was a concern that faculty expressed both in their pre-CHEO perception of online teaching and throughout the process of transitioning to online teaching during the CHEO grant. This was especially true in regard to the lab components of many hard science courses. Faculty were concerned the asynchronous nature of much online teaching would hinder students' ability to receive the same lab experience online as they would in a classroom.

Literature identifies instructor attitudes as a major factor in faculty adoption of online learning (Mitchell & Geva-May, 2009). Teachers' adoption of online learning strategies is rooted in their existing pedagogical beliefs. Pedagogy shifts require not just an increase in knowledge (training in how or what is available), but also a shift in belief (whether the new tools are valuable) (Ertmer, 2005). Overall, faculty did generally report a change both in perception toward online teaching and in their teaching practice over the course of the CHEO grant. Over half, 58 percent (N=17) of faculty respondents reported changing their perception of online teaching. For those faculty members who did experience a change in perception it was uniformly toward a more positive outlook; some faculty retained negative perceptions or remained unconvinced about

the role of online or hybrid teaching strategies in their particular discipline though no faculty member reported developing a *more* negative perception of online teaching. An even greater percentage, 65 percent (N=19), reported a practice change in their teaching since the beginning of the grant.

Changes in Practice

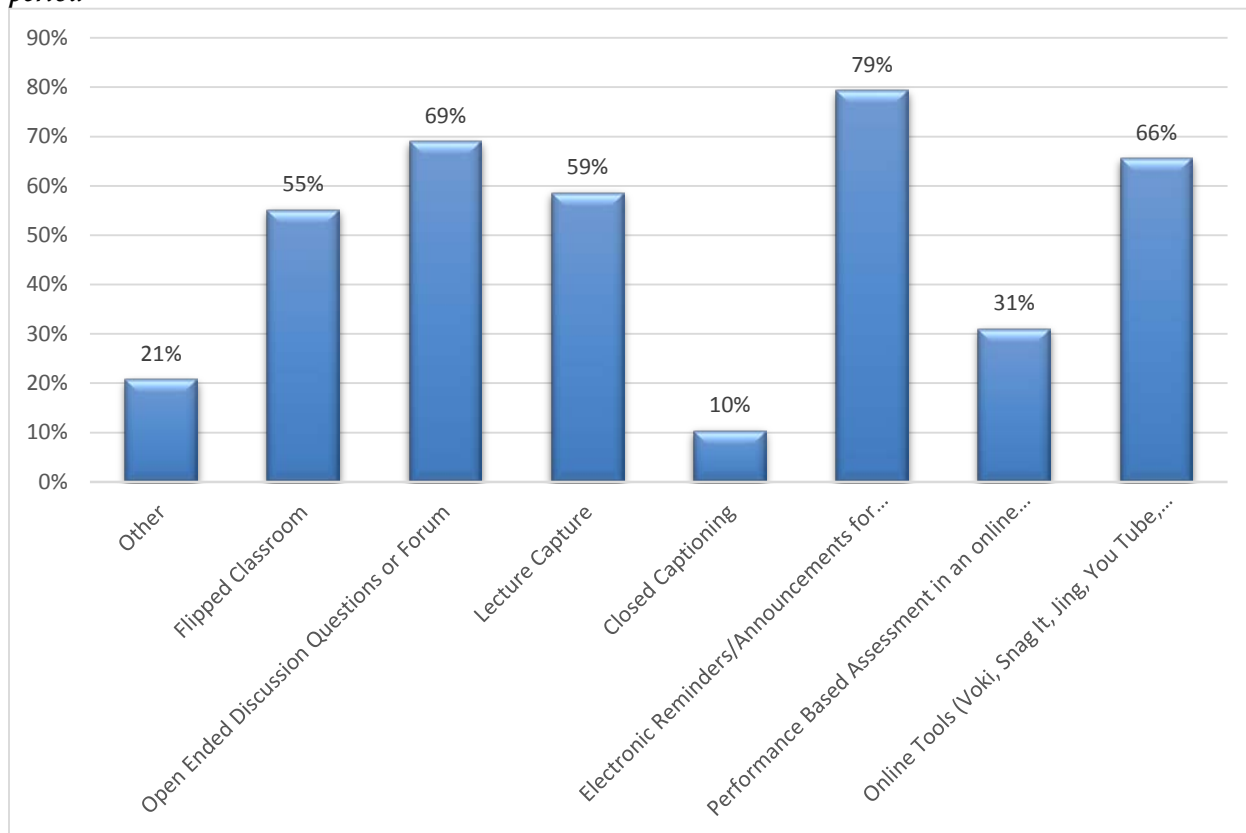
Faculty cited the incorporation of OER as a major practice change resulting from the CHEO grant. The creation of OER has fundamentally changed the way that online education was undertaken at consortium colleges. It has introduced drawbacks, largely through the larger investment of time required to sort or create OER, but it has been a stimulus to innovation across the consortium.

One drawback of the requirement to incorporate OER material was the time-intensity it reportedly required to find suitable material. Faculty consistently referred to the challenge presented by the sheer quantity of OER material available and the amount of time that it requires to sort through resources to find the “diamond in the rough.” This concern about the quality of available OER is commensurate with findings in other studies, where faculty have reported resistance to OER because of the perceived lower quality of available materials (Bliss, Robinson, Hilton, & Wiley, 2013). The quantity and quality of OER materials varies significantly across disciplines and courses.

This challenge, however, spurred collaboration and creativity. CHEO grant money and priorities provided opportunities for faculty members to sort through available OER often with the assistance of an Instructional Designer and, where no suitable resources were found, create their own. Access to the lightboard, a legible writing surface which allows instructors to write as if on a chalkboard while facing a recording device for distance students, itself an OER product, at FVCC allowed faculty there to create a significant amount of their own material that they could also make available as OER. For the development of CHMY 105, they developed approximately 50 videos.

Working with an instructional designer and collaborating with peers also prompted faculty to experiment with other forms of technology and to explore other options for teaching and learning tools. Many CHEO faculty indicated they had increased the incorporation of technological tools in their online courses since the beginning of the grant period. The ability to create or share videos with students was particularly important to many faculty; for example, “the quality and ease of use for recording information for student viewing was greatly enhanced [by the CHEO grant]. I acquired the ability to edit my own lecture recordings and the ability to present them to students in a timely fashion.” 66 percent (N = 19) of survey respondents reported incorporating Online Tools such as Voki, Snag It, Jing, You Tube, nobelprize.org, Wiki or WebEx into their teaching, while 59 percent (N=17) used some form of lecture capture technology for their class. The use of electronic reminders/ announcements, and open-ended discussion questions or forums were also popular amongst survey respondents.

Figure 1: Percent of respondents incorporating various methods into their teaching over the CHEO grant period



For those institutions already delivering online classes, the CHEO grant allowed them to swap existing tools that might be more cumbersome for newer, more effective tools:

We previously used Camtasia for recording lectures. This required software to be installed on every computer used for recording and limited the access to recording. CHEO enabled us to purchase Panopto which allows recording from every computer and tablet. Panopto also allows instructors to easily edit their material improving the quality of the content.

Practice changes also helped facilitate perception changes - new technology tools also provided faculty with an avenue for recreating parts of the traditional classroom environment. For example, one college began using “Zoom,” a synchronous lecture capture and video conferencing tool that allows people in multiple locations to interact face-to-face and share their computer screens, which “[began] to allow us to replicate face-to-face teaching and those important personal interactions in an online environment.” These interactions “get them [the students] connected to you...like in the face-to-face class, you see them and they feel ownership and they also feel that you’re watching them, so they’re more likely to perform.” Another faculty member outlined the way in which they are currently utilizing Zoom:

...In Zoom, I've got two monitors. So I'm sharing my one monitor and my other monitor they can't see. So I can have all their faces popped up there and I can maybe bring up ALEKS¹ and they can't see it until I get to the problem and then I can slide it to the other screen. So, they can see each other on webcam in Zoom...on their screen, they can see these other people's faces popped up. One of them would ask a question. I hadn't gotten to answering yet because another student would pop in so quickly and be like, "well, you know, in this video she did this."

There is significant evidence presented here that change in perception and teaching practice occurred over the course of the CHEO grant. In particular, faculty adopted new technology tools to facilitate lecture capture and increase the amount of interaction with students in an online environment. Collaboration, which was incentivized by the CHEO grant, was also a particular feature of the development of new teaching practice.

SOURCES OF RESISTANCE TO PEDAGOGICAL CHANGE

Overall CHEO effected a pedagogical change for a majority of affiliated faculty; however, not all faculty members were equally receptive to perception or practice change. A consistent set of themes to explain their resistance to change was presented by faculty across the survey results and the interview conducted by EERC staff members. These included: the lack of faculty time for new course development and delivery, concerns about the appropriateness of new delivery modalities for particular subjects and the quality of student outcomes.

Faculty Time

Faculty who are generally positive about online teaching may be resistant to actually teaching online because online courses take a significant amount of time to create and then administer. Research also suggests that faculty both perceive and experience online teaching to be more time consuming to prepare and administer (Cavanaugh, 2005). In fact, online teaching can take a minimum of 14 percent more time to administer than similar courses in the classroom (Tomei, 2006). Beyond the direct activities required to develop new online courses or to deliver them, faculty often have additional and ongoing courses they are also teaching in the classroom during this process.

The nature of online interactions is a major driver behind the increased time commitment for online teaching. Where courses may not take more *time*, they can actually require greater amounts of instructor effort including monitoring the course space across a more diffuse span of time, which faculty may perceive as being time-consuming (Hislop & Ellis, 2004). For example, one faculty member pointed out that "even though it is the same curriculum, so you might think it's not that much more [time to administer], it's a lot more [time] when you add the lab in especially."

¹ ALEKS is a web-based, adaptive assessment and learning system owned by McGraw Hill.

The online [course]...does take more time because in the classroom someone will say, "I don't understand this. Can we meet?" And someone else goes, "neither do I, can I come too?" And you end up with four students in your office at the same time. With online classes it's four individual meeting times instead of meeting with four students [at once].

There is an "additional activation barrier" to communication that increases the amount of time and effort required to work with students in an online environment. One faculty member characterized it as having "this straw instead of a big pipe ... to communicate through", suggesting that faculty find face to face modalities capable of delivering greater quantities of information.

Subject Matter Suitability

Certain subject matters may be particularly difficult to teach online; one group of faculty pointed out that "to type chemistry" or "to type statistics" is difficult – notation and the nature of concepts can be particularly hard to fully communicate in this fashion especially because students are not equipped to "type it" in return. Faculty expressed concerns about the usefulness of many common online teaching tools like discussion forums in subjects like Chemistry and Anatomy; these subjects do not lend themselves to "meaningful conversations" because "they are so unnatural" to the context – one faculty member asked how to have a discussion about "why is the femur called the femur?...it just is." This is congruous with the concern that faculty expressed as influencing negative perceptions *before* the onset of the CHEO grant.

Student Outcomes

The largest sources of resistance to changing pedagogy are centered on concerns regarding student learning outcomes and learning experiences. Existing research suggests that while cognitive factors including learning and achievement are comparable between online and face to face learning environments, both student and faculty perceptions vary across the two (Rivera & Rice, 2002). Students are more likely to rate themselves as less satisfied with an online course even controlling for performance (Summers, Waigandt, & Whittaker, 2005).

Faculty are keenly aware of the value of interaction amongst students and between students and instructors the face-to-face classroom environment. Students' *perception* of the amount they interact in the online learning environment does correlate to their outcomes for certain categories of assessments (Picciano, 2002). Faculty consistently cited concerns around incorporating sufficient student interaction into online courses, and the asynchronous nature of the way most online courses are formatted; for example: "the thing that's lacking is the interaction, which is the hardest thing to do on an online class."

Interaction both between students and the instructor, and between students, is difficult for faculty to create in the online teaching environment. Some faculty feel frustrated by their attempts to solve this problem with existing tools; for example, one faculty member “started a discussion for [students]...to ask... peers questions” and the first week “it was like, oh, I want to have a study group and I want to have a study group and, oh, when are you free?” but eventually the enthusiasm died down and the instructor reported that the “discussion [hadn’t] had activity in three weeks.”

Especially in the hard sciences, some faculty were skeptical that online learning would ever be fully suitable:

I think I come from kind of a thought process where students have to be hands-on. There are so many teachable moments when you’re working [in] the lab, and putting that virtually, putting that online, you lose some of those moments. I think it’s something that’s progressively getting better, but I could not see a lab-based science class completely online. I would, if they were my students, somehow or another I’d want to be working with them because you miss those finer things. When they’re preparing a slide...just as simple as using too much [sample] or that cover slide not being where it needs to be.

The hands-on learning aspect of science labs was considered by faculty who were resistant to online learning as being a significant impediment to fully online science courses. FVCC is planning to overcome this by requiring students to come to campus for a weekend to do multiple lab experiments at the same time. This will allow them to maintain the flexibility of a predominantly online class while overcoming concerns about the quality of distance lab delivery.

Faculty were also concerned that the online format would impede students’ ability to budget their time adequately. Those students who are most successful in online courses are those that are most “motivated, independent and organized with good self-regulation strategies” (Summers, Waigandt, & Whittaker, 2005). Online learning requires independent time management skills:

It’s easier for the in-class students to stay on track than it is the [online students] because it’s so easy [for online students] to say, oh, well, I’ll watch the lecture tomorrow or whatever and before you know it they’re five hours behind in lecture...and so now they’re trying to catch up.

Those students that may self-select into online courses or programs because of their circumstances may also be those students who are least equipped with the skills to be successful in those courses; one faculty member pointed out that a widely held perception is that “the students don’t think that they’re going to have to work as hard” in online courses.

SOURCES OF PEDAGOGICAL CHANGE

The elements identified by CHEO-affiliated faculty to explain their pedagogy and practice changes largely fall into the same categories that the literature identified. Faculty pinpointed collaboration, training, and perceived benefits to students as particularly influential.

Collaboration

Due to the collaborative nature of the grant consortium, interaction with peers both within individual colleges and across consortium schools significantly impacted faculty perception of online and hybrid teaching. The literature has also pinpointed interaction with colleagues, administrators and instructional designers as a source of positive changes in pedagogical attitudes and practice (Lackey, 2011). Collaboration allows for the diffusion of new pedagogical innovations, the communication of educational benefits, and continuity through staff turnover (McGill, Klobas & Renzi, 2014). Teaching online is fundamentally different for instructors in that it is more “intellectually and socially isolated” than traditional teaching methods; community support can scaffold instructors’ “sustained and in-depth collaborative investigation of their online teaching pedagogies and student learning” (Baran & Correia, 2014: 99). For faculty whose initial concern was technological feasibility, they reported a significant impact from collaboration with other faculty members around new tools or technology that could be incorporated into their course:

So initially, before I even got involved ... I was not convinced that you could offer a comparable course online as you do face-to-face. But after visiting with several instructors ... it kind of opened up ideas about what's possible as far as offering a hard science lab online ... I realized that there is more resources out there than I had anticipated, and that I wasn't really going to have to recreate the wheel, but that I could adapt stuff. So once that initial concern was kind of gone, I was able to just kind of explore.

Other faculty also echoed that once they were introduced to potential strategies, they felt more capable or willing to explore available resources for online teaching; one faculty member mentioned that they had a moment where they said “oh, I totally get it now. I can do this”. Faculty members did not just learn about new tools in particular, they learned that they become “aware of available resources” which changed their viewpoint about the “quality and the possibility of online lab instruction.”

Collaboration within the consortium has allowed ideas to be widely disseminated. A lightboard—a high-tech teaching tool which allows an instructor to maintain eye contact and use technology to interact through recorded video—was originally developed at FVCC. Use of the lightboard has expanded at the college and over the summer they made significant progress in developing OER videos for their online CHEMY 105 course. Due to FVCC’s example, PCC and LCCC are currently creating their own lightboards.

Instructor Efficacy

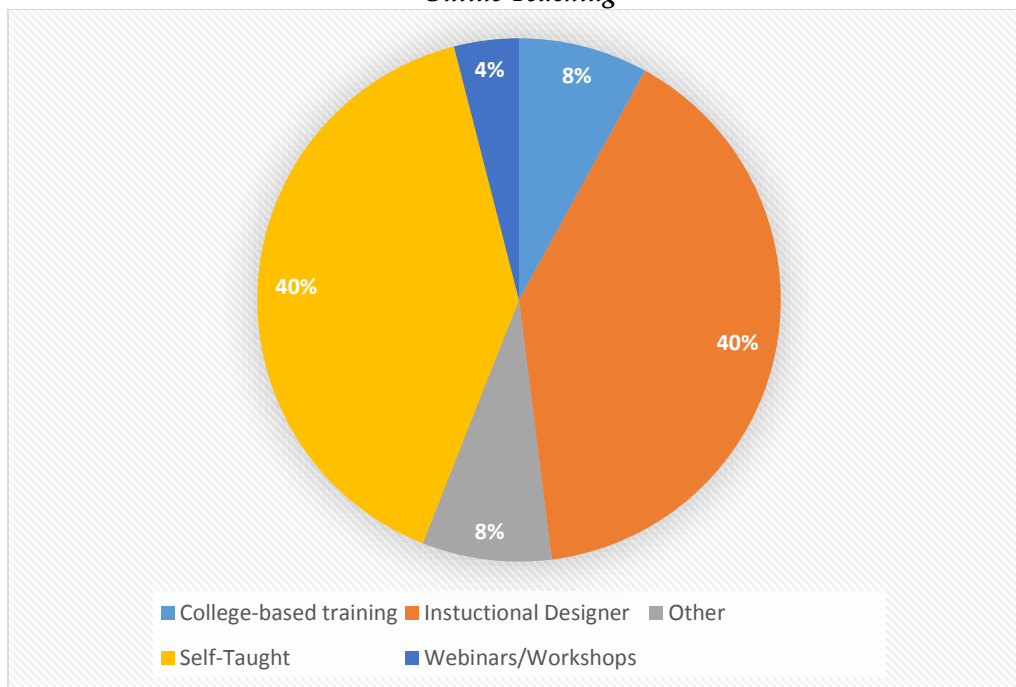
Literature suggests that the greater sense of efficacy faculty feel around the use of online teaching tools, the more likely they are to engage in a pedagogical change around teaching online. Faculty members who responded to the online survey reported the degree to which they felt like they were effective in using online educational tools on a scale from 1 to 100, with 1 being least effective to 100 being most effective. The average faculty response was 76, indicating that CHEO faculty generally feel more effective using the online learning tools than not. Qualitative evidence has also suggested that the CHEO grant was directly responsible for an increased sense of comfort with tools available for teaching online. The literature suggests a gradual or phased approach to introducing instructors to online learning (having them use online enhancements in traditional courses before teaching fully online) better prepares faculty to teach online – it allows them to become comfortable with the technology and reduce the extent to which it is perceived as intimidating (Lackey, 2011; Ajjan & Hartshorne, 2008). For example, one instructor noted the first time she recorded lectures for an online course she was inexperienced with the equipment and “the stressful part was learning how to use the technology to do it.” After becoming more experienced (and finding a more user-friendly technology), the instructor “felt more at ease with the technology” and said it became “so easy” for her to use effectively.

Training

While faculty members such as the one mentioned above felt more comfortable through repetition of the experience or the implementation of more intuitive tools, their sense of efficacy was also increased by training. Training provides faculty with the information necessary to make use of the new tools available (Lackey, 2011; Mitchell & Geva-May, 2009; Baran & Correia, 2014). Greater training lowers the barrier to entry by increasing the ease of use (Ajjan & Hartshorne, 2008). Further, adequate training can provide not just knowledge but a shift in belief by communicating the social influence of peers and administrators, and fostering a sense of faculty efficacy with technology (Ajjan & Hartshorne, 2008).

Formal training opportunities for faculty are not the only way they learn and develop pedagogy around online learning; collaborative opportunities are also widely considered important in the literature. The majority of survey respondents rated either working with an Instructional Designer (40 percent, N = 10) or self-teaching (40 percent, N = 10) as their primary method of preparing to teach online. Faculty were least likely to rate webinars and workshops as their primary source of training to prepare to teach online.

Figure 2. Percent of respondents identifying various methods as their primary source of preparation for Online Teaching



Faculty worked directly with instructional designers at their colleges to receive training around tools, pedagogy and available OER. Interaction with instructional designers, or at least training in online instructional design, can also facilitate pedagogical change (Lackey, 2011). Online teaching requires a shift from traditional methods that many faculty have spent their entire careers being trained in and practicing; collaboration creates an environment where faculty members can help one another “think outside the box.” One instructional designer described their role with faculty as “show[ing] them what’s possible, what they can do and then also they come to me with ideas and I’ve been the one to say, well, I’ll see what I can do to make this happen.”

Across consortium colleges, instructional designers have provided support to faculty in a variety of ways. For example, PCC’s instructional designer has helped to develop and deliver a fully online course to prepare instructors across all four PCC campuses to teach online. The training course “focuses on the pedagogy of teaching online; how it’s different from face-to-face, how to manage groups [online], how to build community online, and how to build student success online and retention.” In addition, they are offering faculty a brown-bag lunch on the first Friday of the month “on academic topics and non-technology topics.” At FVCC, CHEO grant funds have allowed the instructional designer to be trained in video editing – a skill she has assisted faculty with while creating lightboard videos.

Institutional Support

Institutional support and incentives have also played a role in faculty pedagogy change. The development of courses for online or hybrid teaching is time-consuming, even if the instructor has taught the course repeatedly in the classroom. To offset the additional work, and help motivate faculty, several colleges paid faculty extra for developing hybrid classes though they have not received release time. This strategy works as one faculty member pointed out:

..I got paid for it. That makes a big difference. It really does. ...If I would have had to spend all these hours just to do it over summer, it would have been much, much more difficult and at least there was some compensation for everything this summer.

Faculty reported that less material forms of support were also helpful to them during the process of pedagogical change. Institutional support for online teaching initiatives have been found to be highly indicative of their success; “if faculty members know that their organization’s culture respects and rewards online teaching, and makes it accessible and flexible, their motivation to teach online increases” (Baran & Correia, 2014: 100). A faculty member at LATI summarized it:

[LATI] just ha[s] a way of making you feel like your job is the most important job here. And they say that to you. They say that to you your first day here. They say, “Your job is the most important job here.” And I’ve heard that multiple times... It’s just little things that make you want to go the extra mile for the institution here.

On the other hand, faculty that feel like their institutions’ are struggling to realize online education cite the lack of institutional support as a major stumbling block; “they are asking to have people teach online, but not providing the necessary means, training, help to provide the student with a top quality course.” Faculty members who do not feel sufficiently prepared for success by their institutions will be less willing to engage in pedagogical innovation, and less likely to succeed when it is required.

Student Outcomes

Overwhelmingly though, faculty who had a shift in pedagogy reported the perceived value of online education to their students as the primary source of their pedagogical shift. There are two sources of value that faculty identified: (1) greater flexibility for students which is particularly important as the consortium colleges generally serve student bodies that are rural, more likely to be non-traditional, and to be less likely to be able to make it to campus every day, and (2) enhanced delivery of course content.

One faculty member summed up the benefit of online education for modern students succinctly: “Busy, working students need anything to help them be efficient and save time. That is the way the world is now.” Faculty members recognize the particular circumstances of their students’ lives and embrace solutions to the unique challenges those present.

Student flexibility is increased by reducing travel time for students; this is a benefit both for courses that are delivered asynchronous and synchronously. Many of the consortium colleges serve geographically dispersed rural service areas where students may be faced with significant commutes to campus. On many campuses the alternative to hybrid or online courses is to condense learning into long blocks of time during weekends or evenings. One faculty member stated online and hybrid delivery of courses is “a more pleasant experience” than trying to condense class coursework into long evening classes on campus.

Online education provides busy students with the opportunity to do more of their course work at non-traditional times that may better fit their schedules. One faculty member reported that when they tracked student activity in the learning space there was a significant increase in the late evening. Students are not simply taking a traditional course schedule and doing the work from a different location, but rather engaging with the course at times that are challenging for traditional delivery as students are likely to be doing their lessons after work or “after the kids go to bed.”

Faculty who experienced a shift in pedagogy embraced the enhanced delivery options online teaching provided them when presenting material to students. The nature of online delivery allows students to review course material or activities repeatedly. This allows students to “have more time to focus on a lecture. If they need to go back and review something, it’s always there, they can get into it. The activities ... they can do over and over and over again until they get it.”

The specific nature of online learning – the fact that students are already on computers connected to the internet as they do their lessons – also opens up additional resources for a more varied presentation of the lesson content. Faculty are more likely to make use of videos and games online because:

They're already on the Internet...it's easy to click. [The online students say] “Oh, hey, that tutorial was really useful” versus [the in-classroom students who say] “Yeah, I'll look at it,” [but they really mean] “No, never mind.” [And] I would suggest other YouTube channels or other websites that would have additional content if they wanted to explore this a little bit more, and if they needed perhaps another person explaining this in a different context.

CONCLUSION

This paper has established that (1) change over time occurred relative to faculty perceptions and practice regarding online/hybrid teaching over the course of the CHEO grant and (2) factors influencing change were in line with those identified in the literature.

Overall, there has been a sizable shift in faculty perception and practice around online and hybrid teaching at consortium colleges. However, many faculty retain significant reservations about the feasibility of online education for all students and in all disciplines, particularly the

hard sciences. More than half of survey faculty reported some change in their perception of online education, and where change occurred it was always in the direction of feeling more positive about online or hybrid teaching.

In line with existing literature on sources of pedagogical change, CHEO faculty identified training, collaboration, institutional support and the perception of their peers and students as highly influential. Conversely, concerns about faculty time as result of insufficient institutional support and the quality of student outcomes acted on some faculty against embracing online or hybrid teaching to the same degree. The CHEO grant has impacted faculty pedagogy around online and hybrid teaching through the provision of funds for new tools and training and the creation of opportunities for faculty, instructional designers and administrators to collaborate.

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