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Online Faculty Development for Creating E-learning Materials

Virginia Niebuhr1, Bruce Niebuhr2, Julie Trumble3, Mary Jo Urbani4

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ABSTRACT

Background: Faculty who want to develop e-learning materials face pedagogical challenges of transforming instruction for the online environment, especially as many have never experienced online learning themselves. They face technical challenges of learning new software and time challenges of not all being able to be in the same place at the same time to learn these new skills. The objective of the Any Day Any Place Teaching (ADAPT) faculty development program was to create an online experience in which faculty could learn to produce e-learning materials.

Methods: The ADAPT curriculum included units on instructional design, copyright principles and peer review, all for the online environment, and units on specific software tools. Participants experienced asynchronous and synchronous methods, including a learning management system, PC-based videoconferencing, online discussions, desktop sharing, an online toolbox and optional face-to-face labs. Project outcomes were e-learning materials developed and participants’ evaluations of the experience. Likert scale responses for five instructional units (quantitative) were analyzed for distance from neutral using one-sample $t$-tests. Interview data (qualitative) were analyzed with assurance of data trustworthiness and thematic analysis techniques.

Results: Participants were 27 interprofessional faculty. They evaluated the program instruction as easy to access, engaging and logically presented. They reported increased confidence in new skills and increased awareness of copyright issues, yet continued to have time management challenges and remained uncomfortable about peer review. They produced 22 new instructional materials.

Discussion: Online faculty development methods are helpful for faculty learning to create e-learning materials. Recommendations are made to increase the success of such a faculty development program.

Keywords: E-learning, faculty development, faculty learning community, learning objects, online learning

Background

Today’s health professions learners expect their learning to be interactive1 and the learning materials to be available online, delivered in small chunks2, accessible electronically and available any time and any place. Many health professions educators are challenged to meet these expectations because they do not have the skills to develop and deliver interactive e-learning materials and many have never experienced online learning themselves. Schaeffer concluded that the need to help faculty adapt to this new teaching environment is urgent:

Not enough emphasis has been placed on the individual learning needs of the faculty…with respect to these new teaching demands and professional skills. While it may be convenient to assume they will simply adapt to these new demands on their own (and on their own time), the reality is that only a very small percentage of our faculty can successfully and quickly adapt… without assistance of some sort… they must become students themselves.3

Robin and colleagues urged that schools need to support faculty as they adopt new technologies,4 and acknowledged that “teachers themselves often realize that they have much to learn about using new technologies and that just converting their lecture notes to digital format is not enough.”5

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Address for correspondence: Dr. Virginia Niebuhr, University of Texas Medical Branch, 301 University Blvd, Galveston, TX, US 77555-1119. E-mail: vniebuhr@utmb.edu
Educators seeking to develop e-learning materials may seek faculty development opportunities to acquire these skills. Traditional formats include workshops presented locally or at professional meetings, short courses, fellowships and faculty learning communities (FLCs).\(^{6-12}\) However, faculty often find participation challenging because of the requirements of same time same place attendance. Like their learners, they also want their faculty development opportunities to be available at any time and from any place. This challenge is especially severe for health professions faculty balancing clinical, teaching, and research responsibilities.

Another faculty development delivery option is the online method. The virtual or online FLC has been described as a model whereby faculty create a community but need not meet face-to-face.\(^{3,13}\) The online method has been increasingly used for professional development,\(^ {14,15}\) medical education degree programs\(^ {16}\) and continuing education,\(^ {17-19}\) but much less reported for content-focused faculty development for health professions educators.

The Any Day Any Place Teaching (ADAPT) program was our response to the increased need for e-learning materials and to the time and place challenges for faculty development. We investigated the elements that could potentially contribute to a successful online faculty development program for creating e-learning materials.

### Materials and Methods

The project was undertaken at an academic health center in the United States. ADAPT was a 12-month interprofessional faculty development program for health professions educators committed to creating learning objects (LOs) and where most learning occurred through any time, any place online methods. In ADAPT, we focused on the specific subset of e-learning materials termed LOs, defined as digital (thus Internet deliverable), shareable, reusable, teaching units.\(^ {20}\) Research efforts related to the program were approved by the university Institutional (Human Subjects) Review Board.

### Recruitment

The ADAPT program was announced to the entire university faculty, across Schools of Medicine, Nursing, Health Professions, and Graduate Studies. Interested faculty completed an application requiring a project proposal and letter of support. ADAPTers were expected to produce at least one LO during the year and to complete surveys and interviews to contribute to the investigative goals of this project. The expectation was that the minimum amount of time for successful participation was 4–6 h per month.

### Leadership Team

The leadership team for the project was an interprofessional group of five educators, skilled in curriculum development and computer applications. The team included four faculty and one staff member. The team met weekly over four years to plan and evaluate the program, develop the curriculum, build instructional materials and interact with the three cohorts. Team members received 5–35% salary support depending on their roles.

### Materials

Headsets were given to ADAPTers for creating LOs and for participating in web-based discussions; webcams were provided as needed. Software taught to the ADAPTers were either university-licensed or free, required no html-coding or background in web-development, and allowed for creation of LOs with interactivity (e.g. navigation, searching, insertion of audio and/or quizzes). Software taught were Wimba Create or SoftChalk, Adobe Presenter and Windows Movie Maker.

### Instructional Methods

The program kicked off annually with a 2-h group gathering, and afterwards, there were no required full group face-to-face activities. The ADAPT curriculum was a series of interactive online units, each including one to three modules, assignments, pre- and post-tests of knowledge and perceptions, and unit evaluations. Units were delivered through a course management system (Blackboard) in order to track participant access and to easily include links to evaluation surveys. Three units focused on concepts we considered critical for quality development of LOs: Instructional design, copyright issues and peer review, all specifically for the online environment. Additional units covered each of the software products being taught. Curriculum units are identified in Table 1.

We tried a variety of technologies to foster synchronous and asynchronous online interactions among ADAPTers. For asynchronous communications, we primarily used email, but also tried the discussion board within Blackboard and

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**Table 1: ADAPT curriculum: Interactive online units with modules, assignments, pre- and post-tests of knowledge and perceptions, and unit evaluations**

<table>
<thead>
<tr>
<th>Instructional design in the online environment</th>
</tr>
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<tbody>
<tr>
<td>Copyright for online learning objects</td>
</tr>
<tr>
<td>Peer review</td>
</tr>
<tr>
<td>Transforming word documents</td>
</tr>
<tr>
<td>For cohort one, Wimba create</td>
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<tr>
<td>For cohorts two and three, SoftChalk</td>
</tr>
<tr>
<td>Transforming powerpoint: Adobe Presenter</td>
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<tr>
<td>Using video in the online environment</td>
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</table>

\(ADAPT = \text{Any day any place teaching}\)
use of a LISTSERV. For each cohort, we scheduled several synchronous web-based video conferences, using a virtual meeting room (i.e. Adobe Connect). To augment the online activities, we offered each cohort 10–12 optional computer labs and personal consultations. Individual consultations were offered face-to-face, by phone or by remote desktop sharing.

Evaluation
The evaluation was conducted using a mixed methods design of quantitative and qualitative data analysis.

Quantitative data collection and analysis
Participants were asked to evaluate each curriculum unit using Likert scale surveys distributed using SurveyMonkey linked within Blackboard. These evaluations included the impact of instructional materials on participant learning and participant assessment of the software tools. Each Likert scale item was scored as 1 to 5 for strongly disagree, disagree, neutral, agree or strongly agree. Mean scale scores were calculated for Instructional Design (10 items), Copyright (15 items), Peer Review (17 items), Wimba Create (17 items), SoftChalk (14 items), Adobe Presenter (8 items) and Video (20 items). To assess the distance from neutral, the differences between the mean scale scores and the neutral rating (3) were analyzed using the one-sample t-test (α = 0.05).

Qualitative data collection and analysis
At the conclusion of the cohort year, face-to-face interviews were conducted with each ADAPTer, using a 10-question structured interview. Questions focused on their experiences with the structured parts of the program and their own independent work. Examples include “How have you applied anything you have learned from the Copyright unit?” and “Have you taught anyone something you have learned in ADAPT?”

Interviews, conducted by one of four authors, were audio-recorded and transcribed. Transcriptions were qualitatively analyzed using methods outlined by Glicken[22] and Hanson et al.[23] Trustworthiness of the data was established through an iterative process: On Pass 1, each of the five authors read every transcript and highlighted significant statements; on Pass 2, each author sorted highlighted statements into meaningful groups and identified a working theme for each group; on Pass 3, all five authors compared themes, consolidated and renamed the themes by consensus; and on Pass 4, each author then re-sorted the statements into the new theme categories.

Results
Participants
ADAPTer were 26 faculty participating in cohorts between 2009 and 2012 (n = 8, 9, 10 for each cohort, with one faculty member participating in two cohorts). ADAPTer were interprofessional faculty teaching undergraduate and graduate students, residents and fellows. Faculty were appointed in the School of Health Professions (n = 2; 7.4%) Departments of Physician Assistant Studies and Occupational Therapy; School of Medicine (n = 21; 77.8%) Departments of Anesthesiology, Family Medicine, Microbiology, Obstetrics and Gynecology, Pathology, Pediatrics, Preventive Medicine and Community Health, Psychiatry, Surgery; and School of Nursing (n = 3; 11.1%). Faculty ranks were Instructor (n = 1; 3.7%), Assistant Professor (n = 10; 37.0%) Associate Professor (n = 6; 22.2%) and Professor (n = 10; 37.0%). ADAPTer had a variety of education leadership roles, including residency program directors, a department chair, clerkship directors and an assistant dean. Overall, 77.8% of participants were female. The mean age was 50.9, with a range 33–62. Of the ADAPTer, 48% (n = 13) had some prior experience with online teaching.

Learning Objects Produced by ADAPTer
By the end of the three ADAP courses, 22 LOs had been produced using Wimba Create, SoftChalk and Adobe Presenter; and several others were in-process. Targeted learners for these LOs include: First-year medical students; undergraduate nursing students; medical school clerkship students; residents in pathology, pediatrics and psychiatry; and graduate students in occupational therapy and preventive medicine-community health. Content of the LOs varied, including Attention Deficit Hyperactivity Disorder, Medicaid, the statistical concepts of reliability and validity, public health, photography for pathology, antidepressants and an orientation for a clinical rotation. The number of LOs continues to increase as ADAPTer work beyond the 12 months of the program. One ADAPTer has subsequently been awarded a federal grant to support large scale development of LOs for an interdisciplinary curriculum project. Several ADAPTer are now helping their learners create online instructional materials.

ADAPTer Evaluation of the Program
Likert scale data came from completed surveys for each unit: Instructional Design (20/27), Copyright (14/27), Peer Review (18/27), Wimba Create (8/9), SoftChalk (2/16), Adobe Presenter (11/27) and Video (7/27). T-tests showed that the mean scale score was significantly greater than the neutral scale score for: Instructional Design (mean scale = 4.05, SD = 0.35, t = 13.47, P < 0.01); Copyright (mean scale = 3.98, SD = 0.54, t = 6.78, P < 0.01); Peer Review (mean scale = 3.69, SD = 0.4, t = 8.78, P < 0.01); Wimba Create (mean scale = 3.99, SD = 0.71, t = 3.97, P < 0.01); Adobe Presenter (mean scale = 4.44, SD = 0.60, t = 7.98, P < 0.01); and Video (mean scale = 4.36, SD = 0.65, t = 5.49, P < 0.05). The number of completed surveys for SoftChalk (2) was insufficient for statistical analysis.
Qualitative analysis of the survey comments revealed positive perceptions of the instruction, the tools, and the overall program. ADAPTers evaluated the instructional materials as easy to access, engaging, and logically presented. They evaluated the software tools as easy to install, easy to learn, and useful for creating interactive modules. They also evaluated the overall program as positive for gaining skills for their teaching.

Five themes emerged from the qualitative analysis of interview data: Expressing Affect or Attitudes; Understanding Copyright Issues; Managing Time; Building an online FLC; and Developing Learning Objects. Successes and Challenges within each theme were identified from the data. Details are presented in Table 2.

The themes reflected that ADAPTers were confident in their new skills in online instruction yet were apprehensive about adapting to fast technological change. They gained increased comfort with copyright issues, but still worried about violating copyright. They experienced time challenges to complete creation of their own LOs. Although development of an online FLC was generally a success, some ADAPTers admitted reluctance to review their peers’ work.

**Toolbox and LO Repository**

Since completion of the investigational program, all instructional units, software tutorials and installation guides available in a toolbox.

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<td>Apprehension. ADAPTers were apprehensive about technology. Examples: “The technology is always changing.” “I felt overwhelmed.”</td>
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<td>Awareness. ADAPTers were more aware and confident that they could avoid copyright violations. Examples: “I am more consciously aware of my rights and responsibilities as a faculty member.” “When I get stuff from the web I look to see what the copyright status is.”</td>
<td>Insecurity. ADAPTers continue to worry about violating copyright. Examples: “The copyright stuff is very scary as a matter of fact.” “I finally had to go to a copyright lawyer.”</td>
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<td>Managing time</td>
<td>High-to-moderate participation. ADAPTers who were able to commit time were positive about the experience. Examples: “I participated so that I could learn a little bit more about teaching in an electronic environment. I think I learned quite a bit.” “I enjoyed the face-to-face labs. I think they were very helpful to somebody who is primarily a hands-on and visual learner.”</td>
<td>Moderate-to-low participation. ADAPTers were conflicted about competing priorities, which challenged their participation. Examples: “Scheduled learning is not compatible with the life of our faculty; ADAPT could be more self-paced with a brief overview at the beginning.” “I got busier and busier so I wasn’t able to finish all the activities but I think I did get a pretty good idea on tools to use.”</td>
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In a 2013 review of published articles about faculty development programs, Leslie et al. recommend that evaluation of faculty development programs use multiple data sources and combine rigorous quantitative and qualitative methods. The ADAPT evaluation has done so. Outcome measures were participant surveys and interviews, participant products posted for sharing, and leadership-developed curriculum units now available in a toolbox.

**Discussion**

Responding to faculty’s needs to create e-learning materials and to their challenges of time and place for faculty development, we investigated use of an online FLC as a method for faculty to learn to create e-learning materials. ADAPT was a year-long faculty development program conducted for three cohorts of interprofessional educators using online instructional units, asynchronous online discussions, synchronous online conference rooms, face-to-face labs, and individual consultations.

Table 2: Themes identified by qualitative analysis of participant interview data

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ADAPT = Any day any place teaching, FLC = Faculty learning community
Major successes for ADAPT were genuine enthusiasm and gratitude from participants. One participant stated “I would explain ADAPT as an exciting adventure in learning how to use new technology to augment my skills as a classroom teacher.” Participants evaluated the online curriculum as clear, interactive, logically presented, easy to use and providing ample opportunities to practice. They found their new learning to be practical and applicable to their specific teaching needs and especially valued learning about copyright. They identified themselves as part of a learning community and were grateful for the support they received from the leadership team.

The quantitative analyses of unit evaluations identified overall positive participant evaluations. The survey questions were likely not sensitive enough for identifying their perceived concerns. In contrast, the qualitative analysis of interview data did reveal challenges experienced by the participants, including continued concern about copyright issues, reluctance to engage in peer review, and difficulty completing the work.

Participants frequently stated “not enough time” as an explanation for their lack of progress; but we suspect that other reasons underlie this ubiquitous excuse. Two factors made it easier for participants to prioritize their time to proceed through the instructional units or to learn new software. These were having an immediate need for LO development, not just a dream of one day doing so, and having instructional content already built. Some participants had weakly defined goals or project plans too large in scope to complete in a year; and in some instances, we were able to advise the participant to start small. Future research could investigate how traits of self-directedness correlate with successful LO development.

Participants agreed that a genuine FLC developed only partially. ADAPTers readily admitted they were reluctant to seek peer feedback, either because they felt their work was not yet worthy of review or they did not want to bother their peers. In contrast, they freely asked the leadership team for assistance and feedback. For any sense of lack of community, the participants took personal ownership. They felt responsible for not sharing enough with peers, and repeatedly gave credit to the leadership team for their efforts to foster group spirit. One participant reported “You … seem to always be available.”

Indeed, we did try hard to keep the cohort connected. We explored use of the Blackboard discussion board tool, and we tried using a LISTSERV; but these conversations were more unidirectional from the leadership team to the participants, thus they felt forced and rather meaningless. We used email generously. Early in the program, faculty indicated that they liked the online model because being at many meetings was too restrictive. However, it became clear that they also appreciated face-to-face lab times. The most community interaction occurred during web-based synchronous teleconferencing from their homes, scheduled at 9:00 PM to accommodate the greatest number of participants. Participants also valued individual consultations for reinforcement of concepts and technical assistance.

We have identified several possible study limitations. One is that not every ADAPTTER completed all units. We speculate that participants stopped either when they got what they needed out of the program or reached a personal time challenge. Even those who did not fully participate reported value from the program. A second limitation is that the Likert-scale questions likely were not sensitive enough for identifying participants’ perceived concerns. However, the qualitative analyses were quite useful in identifying successes and challenges.

A third possible limitation of the study is that it was conducted with the faculty of only one academic health center. However, the teaching, research and clinical service responsibilities of our participants are typical for health sciences faculty; and we included nursing, graduate school and health professions faculty. Thus, it is reasonable to conclude that the findings can be generalized to other academic health centers.

A final limitation relates to the motivation of faculty to adopt new technologies. This study was conducted with faculty eager to learn new skills; yet the program would have been more difficult with more apprehensive or reticent faculty. As is true for any faculty development program, this is a program model best suited for volunteer rather than mandated participation.

**Recommendations**

We offer the following recommendations for others wanting to develop online faculty development programs for creating e-learning materials.

- **Build on what faculty already know:** Participants were building LOs on content well-known to them. We chose tools that built on their existing skills (i.e. software which transform Microsoft PowerPoint and Word presentations)
- **Identify available resources:** We chose to focus on Wimba Create, SoftChalk, Adobe Presenter, and Windows Movie Maker because our faculty had access to these products.
- **Model best practices:** We took care with our instructional units to model best practices in design, copyright adherence, interactivity and reusability
- **Attend to instructional design:** LOs have a permanency that live lectures do not, thus it is important to aim for quality in content, design and delivery. Focus not only on the technical aspects of building LOs, but also on instructional design and development of learning objectives. We required ADAPTers to complete the Instructional Design unit first
• **Emphasize copyright:** Early in the program, we provided foundation and practice exercises for understanding copyright issues for LOs

• **Encourage content development before learning software:** Participants with already-prepared content were more likely to complete creation of an LO

• **Provide support:** We provided many-time and any-place support by making a genuine commitment to be available to participants (even if late at night), using remote desktop sharing, email, telephone, office calls and both morning and afternoon choices for labs

• **Provide feedback:** Develop strategies for providing feedback both on content and on instructional design. Perhaps it is not as important who gives feedback, as long as someone does

• **Recognize and reward success:** We posted ADAPTer’s LOs on our website, announced success to the ADAP community, and provided certificates of program completion. Although the program application required a chair’s letter of support, assurance for protected time was not mandatory. We speculate that the rate of LO completion could be increased if time to develop LOs were explicitly valued as much as time to develop or give lectures (e.g. teaching credits). Recognition could also be made through an award program for innovative LOs

• **Expect changing technologies:** We experienced a number of technology changes in the three years of this project (e.g. revolution of mobile apps, new software releases). Continued change will require updates of instructional materials, but more importantly, will challenge your program’s goals and planning. Be adaptable.

### Summary

From both content and process frameworks, ADAP was a faculty development success. The content of the program was learning to create e-learning materials. All participants began development of new teaching materials and several completed and implemented their products. The program process was a blending of mostly online instruction with supportive face-to-face interactions. Teaching strategies included self-instructional modules, labs, web-based discussions and individualized consultations offered face-to-face or with desktop sharing. Through experiential learning, participants gained insight into the anytime-anyplace learning environment which their learners experience. We believe our goal was accomplished to use online methods to teach development of e-learning materials. In addition to the products created, we established a cadre of faculty who can confidently build e-learning materials and help others.

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