

## INSTRUCTIONAL DESIGN AND ASSESSMENT

### An Asynchronous Learning Approach for the Instructional Component of a Dual-Campus Pharmacy Resident Teaching Program

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Submitted May 20, 2014; accepted July 25, 2014; published March 25, 2015.

**Objective.** To describe the shift to an asynchronous online approach for pedagogy instruction within a pharmacy resident teaching program offered by a dual-campus college.

**Design.** The pedagogy instruction component of the teaching program (Part I) was redesigned with a focus on the content, delivery, and coordination of the learning environment. Asynchronous online learning replaced distance technology or lecture capture. Using a pedagogical content knowledge framework, residents participated in self-paced online learning using faculty recordings, readings, and discussion board activities. A learning management system was used to assess achievement of learning objectives and participation prior to progressing to the teaching experiences component of the teaching program (Part II).

**Assessment.** Evaluation of resident pedagogical knowledge development and participation in Part I of the teaching program was achieved through the learning management system. Participant surveys and written reflections showed general satisfaction with the online learning environment. Future considerations include addition of a live orientation session and increased faculty presence in the online learning environment.

**Conclusion.** An online approach framed by educational theory can be an effective way to provide pedagogy instruction within a teaching program.

**Keywords:** pharmacy residents, teaching, teaching certificate program, academic pharmacy, online learning

## INTRODUCTION

Current accreditation standards for pharmacy residents include broad goals and objectives related to developing teaching skills across a wide range of settings and audiences.<sup>1</sup> Within the scope of these standards, specific curricular content and teaching methods offered in resident teaching programs varies, though pedagogy instruction prior to mentored teaching experiences is common.<sup>2-9</sup> Guidelines for resident teaching experiences were developed by the American College of Clinical Pharmacy (ACCP) to promote standardization.<sup>10</sup> These guidelines address teaching experience standards for residencies with or without a formal teaching program or certificate program through an affiliated academic institution. Suggested minimum goals for resident teaching programs include baseline pedagogy instruction, teaching experiences under the guidance of a faculty mentor, and teaching philosophy for inclusion in a teaching portfolio.

Suggested topics for pedagogy instruction include, but are not limited to, creating a teaching philosophy statement, writing assessment questions, precepting students, and learning the roles and responsibilities of a faculty member and/or preceptor. The guideline recommends “active participation in pedagogy seminars” in teaching programs for pedagogy knowledge development prior to teaching experiences, but does not stipulate a delivery format for this instruction. A live seminar approach appears common for pedagogy instruction within teaching programs, although prerecorded or distance learning sessions have also been used.<sup>2-9,11-12</sup>

In fall 2010, Albany College of Pharmacy and Health Sciences (ACPHS) began offering a teaching program to residents and fellows affiliated with the main campus in Albany, New York and the satellite campus in Colchester, Vermont. While not a “certificate program” according to New York State Department of Education requirements, the teaching program was designed to include requirements comparable to established resident teaching certificate programs in other states.<sup>3-5,9,12,13</sup> Our teaching program offered pedagogy instruction (Part I) prior to engaging in

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teaching experiences under the direction of a faculty mentor on either campus (Part II). For the first 2 offerings, Part I involved monthly seminars delivered in both synchronous and asynchronous formats; seminars were offered live through distance learning, with recorded content later posted in a learning management system. Related readings and suggested discussion board activities were also posted in the learning management system.

Beginning with the 2012-2013 offering, the teaching program was redesigned to offer Part I in an asynchronous online learning environment. This manuscript concentrates on modifications to the content, delivery, and coordination of Part I of the teaching program. Description of Part II is included in this manuscript only where applicable to the redesign of Part I.

## DESIGN

The need to change our approach to pedagogy instruction in Part I was informed by 2 years of program evaluation data. Participant evaluation data from the 2010-2011 and 2011-2012 offerings was limited because the response rate was low, but the data was consistent with informal feedback collected from teaching program faculty members and residency/fellowship program directors. The content, delivery, and coordination of Part I's pedagogy instruction needed improvement. Topic organization, sequencing, and relevance were primary concerns. Technology barriers existed with the delivery of the live distance learning seminars and lecture recordings. Participants also experienced problems with accessing learning materials within the learning management system. Teaching program faculty members were concerned with participant engagement, citing limited attendance at live seminar sessions, technology issues with recorded sessions, and underuse of the discussion board. Challenges associated with coordinating Part I included evaluation of knowledge development among participants and regular oversight of their engagement.

Transition to an asynchronous online learning approach for Part I was informed by review of published teaching program experiences, educational theory, and 2 online pedagogy initiatives from ACPHS.<sup>2-23</sup> The 2 initiatives that served as models for the redesign were a professional development program titled Helping Educators Learn Pedagogy (HELP) and an elective course titled Teaching and Learning in Higher Education.<sup>14,15</sup> HELP was an online, 50-hour professional development program offered to local, regional, and national pharmacy educators. The elective was a 3-credit course offered to ACPHS students in a predominantly online format. Both initiatives had the primary objective of developing and

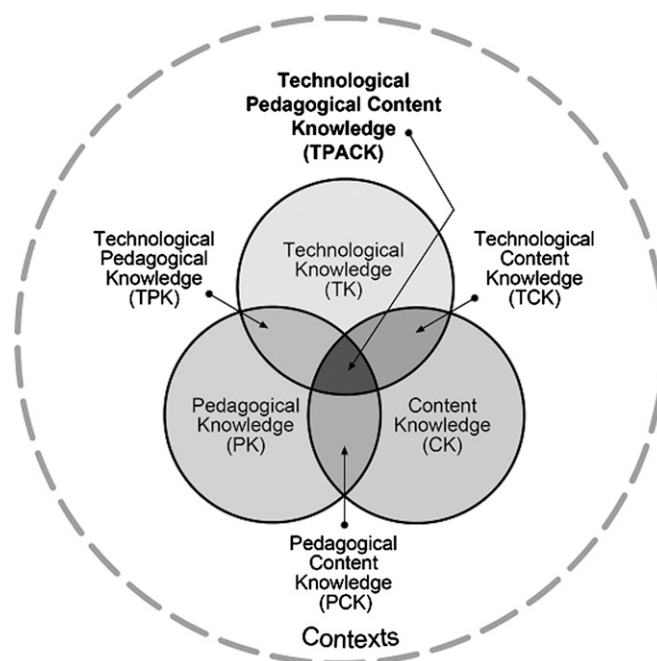


Figure 1. Technological Pedagogical Content Knowledge (TPACK) Reproduced by permission of the publisher<sup>18</sup>

strengthening knowledge and skills in educational theory and practice. They were developed using the Technological Pedagogical Content Knowledge (TPACK) framework (Figure 1), which emphasizes the integration and intersection of 3 key knowledge areas: (1) technology as a resource and tool, (2) teaching theory and practice, and (3) specialized content area.<sup>16,17,18</sup> Since technological knowledge was not a focus for participants in Part I, Pedagogical Content Knowledge (PCK), a subtype of the TPACK approach, was used to concentrate on the intersection of content and pedagogy. Figure 1 shows the theoretical relationships between PCK and TPACK framework.<sup>18</sup>

The PCK framework assumes teachers with both content knowledge and pedagogical knowledge will succeed at conveying learning.<sup>19</sup> In instructional design, the use of PCK is valuable because learning will be compromised if knowledge of pedagogy and content are isolated from each other.<sup>20</sup> Both content knowledge and pedagogical knowledge are considered important components to successful teaching in a college or university setting.<sup>21,22</sup> Moreover, using PCK to frame curriculum and instructional design works well when educating individuals about teaching and learning concepts.<sup>18-20</sup>

Emphasizing integration of teaching theory and practice (pedagogical knowledge) with subject matter specific to pharmacy education (content knowledge), the PCK framework guided revision of the pedagogy instruction in Part I. Changing to a complete asynchronous model aimed

Table 1. 2012-2013 ACPHS Teaching Program Online Learning (Part I)

| <b>Program Objective</b>   | <b>Instruction</b>   | <b>Assessment</b>                |
|--|--|----------------------------------|
| Create a personal teaching philosophy statement for inclusion in a teaching portfolio.   | Module 1: Week 1<br>Introduction/ About Teaching Philosophies                                  | Teaching Philosophy statement #1 |
| Explain considerations related to live instruction including teaching strategies, learning styles, assessment of learning, and student engagement. | Module 2: Week 2<br>Teaching and Learning<br>Module 3: Weeks 3, 4<br>Assessment                | 2 Discussion board assignments   |
| Describe key elements of providing effective facilitation of student learning in both the classroom and experiential settings.                     | Module 4: Weeks 5,6,7<br>Teaching Strategies   | 3 Discussion board assignments   |
| Compare and contrast teaching and learning approaches related to classroom instruction with patient, experiential, and continuing education.       | Module 5: Weeks 8,9<br>Lesson Planning   | 1 Discussion board assignment    |
| Write a personal reflection on teaching experiences for inclusion in a teaching portfolio.   | Module 6: Week 10<br>Teaching Portfolios<br>Module 7: Week 11<br>Careers in Pharmacy Education | Self-reflective essay            |
| Prepare to teach in various settings under the direction of an assigned faculty mentor.  | Module 8: Week 12<br>Teaching Experiences Preparation  | Teaching Philosophy statement #2 |

to strengthen pedagogical content knowledge development among participants. Understanding of teaching strategies and assessments was supported when the pedagogical techniques taught in the learning modules were emulated through faculty instruction and active participation in discussion board assignments. This approach also recognizes the learning preferences of “Generation Y” teaching program participants.<sup>24</sup>

Aligned with program objectives, Part I content was redesigned into weekly theme-based modules (Table 1) in the learning management system. Module topics were organized to strengthen pedagogical understanding through purposeful repetition, scaffolding, and active participation in the discussion board. Learning content highlighted relevant connections to practice, including upcoming teaching experiences in Part II of the program that required development of learning objectives, lesson plans, and assessments.

Each weekly folder included the following components: a faculty recording (with slides), required readings (in published articles and/or on websites), and a discussion board assignment (with specific prompts or questions for each topic). Weekly discussion board assignments required participants to critically evaluate a question or concept related to the weekly topic, then comment on peer responses to the same assignment. This approach guided achievement of learning objectives through critical thinking and participation in collaborative learning. Participant

discussion board communication helped track individual development of pedagogy knowledge. Participants were also required to reflect on pedagogy knowledge development through a self-reflective essay assignment and regular reevaluation of personal teaching philosophy statements during Part I. These writing assignments helped participants integrate PCK by encouraging meta-cognitive reflection.

Part I was taught by 4 full-time ACPHS faculty members with experience in teaching pedagogy. Having a limited number of Part I faculty members aimed to promote consistency in organization, availability, and sequencing of the teaching content. With only 4 faculty members, participants would have fewer teaching styles to acclimate to and fewer teacher-learner relationships to develop in the online environment.

Oversight of the 2012-2013 program redesign was assigned to 2 faculty members, who would serve as program coordinators, in collaboration with a faculty liaison for teaching experiences on the satellite campus. These faculty roles were an important part of the teaching program redesign in terms of facilitating open communication and relating Part I expectations to all stakeholders, who included participants, Part I faculty members, residency/fellowship program directors across affiliated institutions, and ACPHS faculty mentors who provided oversight during Part II. The Part I faculty coordinator oversaw posting materials to the

learning management system, monitoring participant activity (eg, discussion board contributions), and assessing online assignments for achievement of required learning objectives. This research was conducted in a common educational setting involving normal instructional strategies, curricula, and classroom management methods.

Focusing on content, delivery, and coordination, the redesigned Part I was assessed through 2 participant surveys. The first survey was administered at the end of Part I, and the second at the end of Part II. Both surveys were administered electronically and included 10 questions each. Enrollment for the 2012-2013 teaching program included 13 participants (11 residents on the main campus and 2 residents on the satellite campus) across 6 affiliated PGY-1 residency training programs. Participants were invited via e-mail to voluntarily and anonymously complete the surveys. The study was considered exempt by the Albany College of Pharmacy and Health Sciences Institutional Review Board.

The first survey asked participants to complete teaching evaluations of Part I faculty members using a Likert scale of strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). Questions addressed instructional content, assessments, preparedness, knowledge, and communication style. This survey also included open-ended questions regarding educational content/topics of the online modules and how the online course design helped or hindered learning. The second survey consisted of general questions about the teaching program as well as specific questions about whether Part I online learning modules supported participant success with Part II. Participants were asked whether the time devoted to the Part I online learning component was “just right,” “too long,” or “too short.” This survey also asked participants to list features they felt were missing from the program. Both surveys asked about perceived effectiveness of the online learning content (objectives, teaching materials, activities, and related time commitment) and delivery (technology format, ease of use, and utility) using the same Likert scale. Feedback on the redesigned teaching program was also collected through assessment of the Part II self-reflection essays. Participant metacognitive reflection in the essay was evaluated for pedagogical content knowledge development consistent with the stated Part I objectives.

## EVALUATION AND ASSESSMENT

All enrolled participants completed Part I (n=13 for first survey), and 1 resident didn't complete Part II (n=12 for second survey). The response rate was 92% (12/13) for the first survey and 92% (11/12) for the second survey. Fifty percent of respondents agreed that the technology

used for delivering Part I online learning was effective and that they liked the online learning environment, although 25% were undecided, and 25% did not like the asynchronous learning approach. Those not in favor of the online learning environment cited preference for a live seminar format, a desire for more live interaction with faculty members, more peer discussion, or difficulty keeping up with self-paced online learning.

Free-text comments from 67% of the participants described the value of the self-paced learning schedule and accessibility to asynchronous learning materials, including faculty recordings that could be paused and revisited. A few participants (17%) described preference for synchronous, scheduled learning and did not enjoy the online learning approach, citing frustration with accessing content in the learning management system. The majority of respondents (66%) found the time commitment for the online learning component to be manageable and well-balanced.

Most respondents (75%) thought the Part I learning objectives were relevant. A majority (90%) identified that the online content and materials (eg, readings, recordings) supported achievement of the teaching program learning objectives. Some respondents (25%) felt the various online assignments and activities did not always support achievement of the desired learning objectives. Participants favored 2 modules: teaching philosophy (module 1) and classroom/lesson planning (module 5). Some participants (17%) commented that discussion board assignments related to writing examination questions (module 3) and writing learning objectives based on a general learning topic (module 2) would be more beneficial if based on a pharmacy topic. Participant feedback was mixed regarding perceived value of discussion board activities, with 50% disagreeing with the value, and 42% responding neutrally. A few respondents (17%) cited frustration with discussion board assignments in the self-paced online learning environment, particularly when the assignment required each participant to comment on 2 or 3 other participant posts. Some participants (15%) were delayed in completing the assignment by 1 week.

Faculty teaching evaluations were generally positive, with scores ranging from 4 to 5 on the 5-point scale. When asked whether there was a good balance of communication between participants and faculty members in the online environment, 58% percent responded neutrally with the other 42% split between agreeing (17%) and disagreeing (25%). Written feedback indicated preference for a stronger faculty presence in the online learning environment, particularly with respect to discussion board conversations and more feedback on self-reflection

Table 2. Sample Participant Feedback from the ACPHS Teaching Program

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“I feel confident going into the upcoming teaching experiences.”

“I feel I have developed a variety of skills from this course including creating effective objective questions, developing a lesson plan, creating a lecture based on the objectives, and utilizing formative and summative assessment.”

“The teaching program [online] class taught me a lot in terms of how to prepare to teach, what types of activities and teaching styles to consider using, and how to assess the students. It is far more complicated than I originally thought before I started the program.”

“While the online modules were convenient, they certainly did not foster relationships with the teachers.”

“My greatest challenge was [that] I wasn’t sure of the quality of work I was doing.”

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essay assignments (ie, teaching philosophy statement drafts and the module 8 self-reflection essay).

Results from the second survey indicated that 73% of respondents felt the online learning in Part I prepared them for each of the teaching experiences in Part II. Twenty-five percent of respondents were undecided on the value of the online learning modules in terms of their success with the 4 teaching experiences. In the summative reflection essay, participants indicated overall satisfaction with Part I online learning, providing many positive reflective comments (Table 2).

When respondents reflected on Part I during the second survey, 73% of participants considered the number of weeks dedicated to online learning “just right,” whereas 27% felt the time period was “too long.” Written comments supported the value of the information and effectiveness of the design/construction of the online learning environment. Some respondents (44%) also cited a preference for face-to-face sessions, including a “meet and greet” session before initiating the online learning in Part I. Respondents found significant value in regular communication with the teaching program faculty coordinators.

## DISCUSSION

Asynchronous pedagogy instruction for Part I of our teaching program provided a guided, self-paced learning environment deemed valuable by most participants. A PCK framework worked well to address the curricular and instructional design changes, emphasizing the integration of pedagogical knowledge with content knowledge. Content, delivery, and coordination of Part I pedagogy instruction was redesigned to align with expectations for teaching experiences in Part II and to be more relevant in practice.

Assessment data indicated that participants felt overall satisfaction with the asynchronous Part I online pedagogy instruction. The second survey included more positive feedback about the online learning in Part I compared to the first survey, which may mean participants gained different perspectives after getting some distance from the online modules and having the opportunity to

apply the knowledge to teaching experiences. A future goal for the teaching program is to foster stronger connections between the knowledge gained in Part I and its application to Part II teaching experiences. One approach to achieve this goal might involve evaluation of faculty mentor perspectives in terms of how the Part I instruction supported or could better support participant success in Part II. A survey of mentor perspectives regarding participant preparation for Part II was not available for comparison prior to the shift in the program, but this will be an important area for future evaluation.

Using an asynchronous online delivery method for the Part I pedagogy instruction was not welcomed by all participants. While some participants enjoyed the online learning approach, others indicated they wanted more face-to-face learning opportunities with faculty members and peers. Some participants cited struggles with keeping pace and fostering self-direction with weekly online learning. A few participants suggested adding at least one face-to-face orientation session before commencing Part I, seeking engagement with faculty members and peers outside the online learning environment. Future considerations for Part I include transition to a hybrid approach, with the addition of some face-to-face sessions to foster interaction between program faculty members and peers. One option could be to begin and end Part I with a face-to-face session, or perhaps to alternate live and online learning every few weeks. It may also be sensible to offer a face-to-face orientation session for all program faculty members, including mentors involved with Part II teaching experiences, to allow for continuity as participants transition from pedagogy instruction to teaching experiences.

Delivery of online material also met challenges in terms of organization and limitations of the learning management system technology platform according to several participants. Some of these difficulties appeared to be related to the use of the learning management system online tools (eg, discussion board, announcements, gradebook). Negative impressions of the online learning environment may also have been related to technological issues (eg, poor audio recording quality of 1 module).

Possible solutions may be to provide more in-depth orientation to Part I to explain the utility and expectations of the learning management system tools from a teaching and learning perspective.

Some participants found pedagogy knowledge development in some modules less valuable when they were assessed on general knowledge rather than knowledge specific to pharmacy education. For example, in module 3, participants were asked to write examination questions and to create learning objectives that could be used to teach a basic, nonpharmacy topic. This assessment allowed participants to use self-selected general topics, such as "How to bake a pie," to demonstrate understanding of pedagogy outside of pharmacy. This approach had been successful in the elective course design and was a natural inclusion for the online learning modules of the teaching program. However, participants indicated it did not work well and instead would have preferred assessments that directly prepared them for teaching experiences (eg, if they already knew what teaching topics would be assigned in Part II, they could create learning objectives during Part I). This participant preference was in line with the PCK framework where integration of pedagogy and content knowledge facilitates learning.

The discussion board component of the content redesign was successful in that all participants completed each of the assignments. While discussion and reflection are proven learning techniques, participants did not broadly perceive the online discussion board assignments to be successful in the teaching program modules. This may have been because they perceived assignments as forced discussions rather than organic dialogue in a live classroom setting. The participants liked thinking about the content and communicating with peers; however, the time commitments required for the active, online discussion moved participants away from enjoying the self-paced format. A major barrier involved the fact that participants were posting content on the discussion board on a flexible schedule, which meant that participants who responded earlier in the week had to wait until later in the week to complete the required peer dialogue for the assignment. Some participants viewed this process as having unnecessary steps each week, particularly after having completed all learning requirements for the week. This concern with the discussion board may explain why some participants considered the time for online learning in Part I to be "too long." Improvements to the discussion board may include setting virtual timeframes for select activities (eg, log on during a 1-hour time frame on prescheduled dates), though this design could create other logistical issues.

Critical thinking and collaborative learning through discussion board activities was successful in Part I, but

many participants cited preference for a stronger faculty presence in the online forums. Creating a sense of community among participants within an online discussion board can be challenging for faculty members to foster, requiring a social, cognitive, and teaching presence to support success.<sup>23</sup> For subsequent offerings, the Part I faculty coordinator could include more transparency about the pedagogical approach with the discussion board assignments, which would be to post a question or task and have other participants learn from different perspectives and the related dialogue that ensues. Moreover, it may be important for participants to know that the role of the Part I faculty coordinator is to read all posts but to reserve his or her own posts for clarifications, responses to questions, or statements to stimulate conversation, and that the rationale for this approach is to avoid stifling participant dialogue and promote a stronger sense of community among participants.

Participant comments also indicated a preference for more faculty feedback on formal teaching philosophy assignments completed at the beginning and end of the online modules. Part of the limitation with faculty feedback on the assignments may have been accessibility within the learning management system gradebook (it involved several clicks) and the fact that responses to participants may have been too formative (eg, there is no wrong or right in evaluating a teaching philosophy statement, only suggestions). Planning for the time involved in providing faculty feedback on assignments and explaining each assignment's purpose to the participants are other important aspects to consider when incorporating assignments into online learning modules for teaching programs.

Including a faculty coordinator enabled oversight of technology access, communication among stakeholders, engagement among participants, organization of faculty-presented learning materials, and review of online assessments for achievement of learning objectives. Having 2 faculty coordinator positions for Part I and Part II provided the structure to align content, delivery, and coordination of pedagogy. It was also important for the faculty coordinators to work collaboratively with the satellite campus faculty liaison to assure that online learning modules prepared participants for Part II teaching experiences on that campus. Increasing the number of faculty coordinators allowed them to delegate responsibilities, plan, supervise, and improve communication with each stakeholder so the program could be successfully offered across 2 campuses and multiple postgraduate training facilities.

## SUMMARY

An online learning approach framed by educational theory was an effective way to provide participants with

pedagogy instruction within a teaching program. Revisions to the pedagogy instruction component (Part I) of our teaching program involved modified content, delivery, and coordination based on feedback from the first 2 years of the program. The Part I redesign changed the monthly seminar format to asynchronous weekly online learning modules. The online learning modules were generated using the PCK framework and modeled after successful curriculum and instructional initiatives at ACPHS. Part I online learning modules aimed to provide pedagogy instruction for application in Part II teaching experiences and practice.

Generally positive feedback from participants accompanied the redesign, which provided a flexible, sequenced learning approach. Suggestions for future enhancements included more online faculty presence, particularly in the discussion board, and more face-to-face sessions to address learning preferences of the cohort. Participants also wanted more feedback on written assignments and more details or suggestions at the beginning regarding the importance of time management in the online learning environment. A goal for future teaching program offerings is to add pharmacy-specific topics for all discussion board assignments, which will consistently utilize the PCK approach to better unite content and pedagogy. Overall, an asynchronous online approach for pedagogy instruction is a feasible option for offering a pharmacy resident teaching program within a dual-campus college.

## ACKNOWLEDGMENT

The authors would like to acknowledge the efforts of Dr. Joanna Schwartz, assistant professor in the Department of Pharmacy Practice at ACPHS for her stamina and devotion to the inaugural 2 years of our college's teaching program. The authors would also like to thank Dr. Emily Sutton, assistant professor in the Department of Pharmacy Practice at ACPHS, for her efforts implementing the redesigned teaching program as Part II faculty liaison for the satellite campus.

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