INSTRUCTIONAL DESIGN AND ASSESSMENT

Use of Entertainment Elements in an Online Video Mini-Series to Train Pharmacy Preceptors

Craig D. Cox, PharmD,^a Jongpil Cheon, EdD,^b Steven M. Crooks, PhD,^c Jaehoon Lee, PhD,^b Jacob D. Curtis, BA^b

^a Texas Tech University Health Sciences Center School of Pharmacy, Lubbock, Texas

^b Texas Tech University, Lubbock, Texas

^c Idaho State University, Pocatello, Idaho

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Objective. To create an entertaining approach to training pharmacy preceptors.

Design. A training program was developed to provide an innovative, entertaining, and flexible continuing education program for pharmacy preceptors. Three instructional design principles – providing an authentic context, offering a diversity of content, and engaging and maintaining attention – were foundational to this concept. The mini-series consisted of 12 online video episodes. Participants completed three reflective questions and one evaluation after watching each episode. Three months following completion of the training, a survey was distributed to analyze the long-term impact of the mini-series on precepting skills.

Assessment. Two hundred two participants completed all 12 episodes. After completing the training series, the participants' confidence level in their knowledge pertaining to the objectives was significantly greater than before they started. Among the 32% of participants who responded to the three-month follow-up survey, the mean score for precepting confidence was 6.8 on a scale of 1 to 10 on which 1=no increase to 10=big increase. Also, 99% of participants indicated they would complete a similar training program and recommend to others.

Conclusions. Feedback from the mini-series provides evidence of the effectiveness of its delivery format and use as a preceptor learning tool.

Keywords: preceptor, online, experiential, pharmacy, education

INTRODUCTION

Experiential education continues to be a major component of the curricula of pharmacy colleges and schools. Introductory and advanced pharmacy practice experiences are delivered by a combination of adjunct and full-time faculty preceptors. A critical component of experiential education is the training of preceptors responsible for educating students on clinical experiences. In February 2015, the Accreditation Council for Pharmacy Education (ACPE) released their new 2016 standards.¹ Standard 20 focuses on preceptors and their training. Even prior to release of these standards, the need to enhance the quantity and quality of existing preceptor training programs had been noted in a number of recent institutional and nationwide surveys.²⁻⁶ In addition, Danielson and colleagues conducted a survey of experiential education administrators and found that preceptor

training was ranked as the fourth most concerning issue among the 78 participating institutions (66% of colleges and schools of pharmacy).⁷

Surveys have provided further insight into the specific needs and preferences of preceptors. A survey of more than 4,800 preceptors conducted by Skrabal and colleagues reported the following: web-based online programs were the preferred method of training (44%); continuing education credit was considered an important incentive for completing training (92% agreed or strongly agreed); 30 minutes was considered the ideal length of training (51%); and time was the largest barrier to participating in training (55%). Additionally, the respondents indicated that a mean of three hours of training should be completed each year by preceptors.⁶

A diversity of preceptor training programs currently exist around the country. Programs developed by individual institutions, collaborative efforts of consortium-based institutions, professional pharmacy organizations, and commercial entities are all available. Several mediums

Corresponding Author: Craig D. Cox, 3601 4th St. STOP 8162, Lubbock, TX 79430. Tel: 806-743-7640. Fax: 806-743-4209. E-mail: craig.cox@ttuhsc.edu

have also been used including live workshops, online modules, podcasts, vodcasts, webinars, and written programming. These programs vary in length and many offer continuing education credit to their participants. A recent review of pharmacy experiential education websites reported that of the colleges and schools that discussed preceptor training on their websites, 87% referenced the *Pharmacist's Letter*.⁸ This is of interest since this resource may be provided free to participants and offers a diversity of training. Such widespread use of a free resource is not unexpected however, considering a recent American Association of Colleges of Pharmacy (AACP) Council of Deans report found that minimal financial resources are allocated toward preceptor training as compared to other experiential education program costs.⁹

In discussing preceptor training, it is important to consider key adult-learning principles. These may include, but are not limited to the following: the content must be based on the perceived learning needs of the participant; the learning materials must be organized in a logical fashion; the instructional methods must involve active learning, ie, allowing for participants to use previous knowledge/experience in applying new information; and the learning environment must be safe and supportive. Training must also consider potential generational differences and preceptor learning style tendencies to adequately reach a broad audience.

We developed a preceptor mini-series training program based upon the key adult learning principles described above. The objective of the mini-series was to provide an innovative, entertaining, and flexible continuing education program and to evaluate both the short- and long-term impact on participants' self-perceived preceptor abilities. This manuscript will provide an overview of the mini-series concept and focus on quality improvement outcomes related to its initial release.

DESIGN

Conceptualized in 2009, the mini-series concept was the culmination of an extensive review of the different types of education and training programs available, preceptor needs, and the desire to foster lifelong learning. To help break the monotony of learning and achieve the goals of delivering preceptor training, a design strategy for a video mini-series was identified and put into action in 2012. The mini-series concept provides the versatility to deliver a multitude of different educational topics using a variety of delivery formats. In an attempt to create unique and engaging educational content, the video mini-series takes the form of a professionally produced movie. In considering the busy schedules of preceptors, the mini-series was divided into 12 video episodes, five to

eight minutes in length, that all followed a central plot. The story follows the lives of a young, inexperienced preceptor and her two students. One student is an overconfident advanced pharmacy practice experience student and the other a shy introductory pharmacy practice experience student. The series begins with their orientation and ends with their final evaluations. Each episode was designed to include entertainment, preceptor-student scenarios, preceptor expert commentary, and preceptor teaching pearls. The mini-series concept was also an integral component of a much broader preceptor training initiative for Texas Tech University Health Sciences Center School of Pharmacy (TTUHSC SOP).

The development of the mini-series was guided by three research-based instructional design principles: engaging and maintaining attention, providing an authentic context, and offering a diversity of content. The theoretical framework provided the design team with the direction needed to accomplish the objectives of the mini-series.

Behavioral and cognitive psychologists have recognized attention as a fundamental principle of learning, instruction, and motivation for decades. For example, more than 80 years ago, Thorndike identified attention (the original term used by Thorndike (1937) was *readiness*, a construct he described as encompassing concentration, focus, and a clear incentive for learning) as one of his three primary laws of learning.¹⁰ Similarly, Gagné and Briggs identified attention as the first of his nine events of instruction.¹¹ Finally, Keller identified attention as the first of his four categories of conditions that must be addressed in order to initiate and sustain motivation while learning.¹² The principle of attention was applied to the mini-series by including professionally produced video episodes that consisted of the following characteristics: brevity, humor, and variability. Each video episode was relatively brief, ranging from 5 to 8 minutes, which is well within the attention span of the target population of adult learners. Each episode began with a brief, 30- to 60-second humorous scenario specifically designed to focus learner attention on the episode objectives. Finally, each episode was designed to include entertainment (eg, student crying over constructive feedback), as well as preceptor-student scenarios, preceptor-expert commentary, and preceptor teaching pearls.

Choi and Hannafin suggest authenticity as a way of providing a meaningful context for learning.¹³ Authenticity refers to the nature of the learning task. Authentic tasks involve activities that practitioners and experts engage in during real problem-solving situations, not the simulated processes typically required in formal schooling.¹⁴ Learning environments that involve

authentic tasks will be more likely to support transfer of learning to real-life situations. Recognizing the importance of this learning principle, we carefully considered the scenarios and characters used in the mini-series design. The core element of each video episode is an authentic scenario involving a situation frequently encountered by preceptors during their work with students. Each scenario provides a rich, authentic context for learner reflection. Each episode maintains authenticity by including a full cast of characters with whom preceptors would typically interact (eg, nurse, pharmacist, physician). Using video as a medium for instruction adds further contextual authenticity by depicting characters in ways and in places not possible to convey through text or audio alone (eg, wearing authentic dress, using authentic mannerisms, set in a hospital, clinic, or student lounge).

Choi and Hannafin recommend content diversity as a method for embedding meaningful content into authentic learning environments.¹³ Content diversity can be achieved by varying the situations in which learners reflect on what they have learned.¹⁵ This helps learners to learn at a level of generality that enables them to transfer knowledge and skills to new situations, explore a diversity of perspectives, and see interrelationships between content domains. This principle was accomplished in the mini-series through scenario diversity and perspective diversity. The video series includes 12 episodes covering a variety of realistic situations often encountered by preceptors as they work with students. Continuity between episodes helps reduce cognitive load as the same preceptor and two students work through several challenges in a six-week clinical inpatient rotation. In addition to scenario diversity, there is perspective diversity within each scenario. This was accomplished by having the student characters present polar opposite viewpoints that in turn presented unique challenges to the preceptor. In response, the preceptors provide multiple perspectives within each scenario. Finally, each episode includes a diversity of content type (eg, entertainment, preceptor-student scenarios, preceptor-expert commentary, and preceptor teaching pearls).

The vice chair of experiential programs scripted and directed the first mini-series. It was entitled "Preceptor Pharm Tools." The storyline follows a young preceptor and two students (one introductory and one advanced pharmacy practice experience student) through a six-week clinical inpatient rotation. The two students are polar opposites and present unique challenges to the preceptor. Through these interactions, the basic concepts of orientation, feedback, evaluation, and dealing with difficult students are addressed (Table 1).

The strategy for development and launch of this training program was meticulous and time intensive. To bring the mini-series to fruition, an appropriate budget, detailed strategy, and professional production company were needed. Four proposals were received and reviewed by the vice chair of experiential programs, assistant director of experiential programs, and the continuing education committee. The review and selection process took approximately six months. The cost to produce the video series was \$9,000 for all 12 episodes. The project was funded entirely by TTUHSC SOP.

Once the company was secured and the scripts were finalized, a list of what was needed to begin shooting was created. This included the cast, scene locations, props, and wardrobes. Permission and special provisions had to be requested and granted as secure and private locations were used for filming. Actors for the mini-series were identified using a casting call and targeted identification and selection. Scheduled and unscheduled rehearsals helped the cast to become more comfortable in each of their roles. During rehearsals and private line readings, the props and wardrobe essentials that were needed were identified and subsequently acquired.

The mini-series was shot over a two-month span. To avoid any appearance of the school being biased or promoting any businesses, efforts were made to blur business names, logos, and other identifying information. The final product was provided in several digital video formats including .mov and .mp4 and in both 720p and 1080p resolutions. The production company provided copies of the individual episodes as well as a single video that contained all 12 episodes. Additionally, a trailer for the mini-series was developed using footage from the shoots.

After the mini-series was completed, TTUHSC SOP underwent a process for accrediting each episode for continuing pharmacy education credit. The video episodes, reflection questions, and accompanying episode evaluation forms were distributed to a 12-member peer review committee that was responsible for reviewing content and determining the appropriate amount of credit to award. The committee was comprised of members from the preceptor advisory committee, continuing education committee, and other select faculty members. The reviews were unanimous in identifying, on average, 15 minutes of CE credit for each episode. Thus, when preceptors completed all 12 episodes of the mini-series, they would receive a total of three hours (12 episodes $\times$ 15 minutes) of continuing education credit. This met the CE goal we had established for the mini-series, based on the state of Texas requiring preceptors to obtain three hours of preceptor-specific continuing education every two years to maintain their certification.

Table 1. Description of 12 Individual Preceptor Mini-series Episodes

Episode Number and Title	Brief Episode Description	Teaching Pearls	Length of Episode (minutes)
#1: Ready for Challenge?	Observe third year and fourth year pharmacy students discussing their upcoming inpatient rotation	Get to know your students Don't give up before it starts	8:38
#2: Orientation	Observe two students and a preceptor during their orientation session at the start of an inpatient rotation	Develop your rotation with your student Have student take active role during orientation	6:59
#3: Lost in Translation	Observe two students and a preceptor during their first feedback session.	Feedback should occur frequently Limit feedback session to 1-2 major issues	7:27
#4: Mistaken Time	Observe a student showing up more than 30 minutes late to rotation and the reaction by student and preceptor	Discuss and enforce school policies Critical issues require immediate feedback	5:20
#5: Checking In	Observe a feedback session between two students and their preceptor	Learners are different thus you must vary your approach Take control of feedback sessions	6:08
#6: Are You Kidding Me	Observe an over confident student acting unprofessional during rounds with a health care team	Inform other health professionals of your role	4:30
#7: Wake-Up Call	Observe a preceptor meeting with an attending physician to discuss the unprofessional actions of her student	Be available to other health professionals Student's actions are a reflection of you Don't wait! Deal with student issues as they occur	4:43
#8: Halfway Home	Observe a preceptor meeting with two students to provide their midpoint rotation evaluation	Feedback should be direct and specific Hold students accountable for your feedback	6:32
#9: Finally Clicking	Observe a preceptor meeting with her student following up from their midpoint evaluation discussion.	Make time for your students Show students you care	5:12
#10: Coming Into Focus	Observe two students and a preceptor individually reflecting on their rotation experience	Recognize students for good performance Be patient with students	6:13
#11: Reflection	Observe two students and a preceptor discussing their rotation experience with friends.	Trust your hard work is making an impact Rewards may take time	6:32
#12: End of the Road	Observe a preceptor providing the final evaluation for two students at the conclusion of a rotation.	Don't give up on a rotation Never stop learning as a preceptor	7:45

Episode 1 – Are You Ready For the Challenge

Description / Reflection Questions

In this scenario, you observe two students who are about to start an inpatient rotation. After you view this episode you will be asked to spend a few minutes reflecting on the following questions:

1. What potential challenges do you see the preceptor facing with these students?
2. How could you prepare in advance to deal with these challenges?
3. List one thing you learned during the program that you intend on incorporating into your rotation experiences?

Precepting Pearls

1. Learn as much about your students/residents as you can before the rotation begins. This can be through portfolios, biography forms, or other means.
2. Don't give up before it starts. Things are not always as they appear. Go into each new experience with an open mind and don't dwell on the past.

Objectives

1. Identify student/resident characteristics that may pose challenges during an experiential rotation.
2. Prepare a comprehensive rotation plan based on individual student/resident characteristics.

CE Hours

0.25

Individual Video Episode

Note: All 12 individual episodes have similar structure, format, and information. This is an example for only Episode 1.

Figure 1. Online View of Preceptor Mini-series Content.

With the episodes accredited, a release strategy was prepared. First, a premiere for preceptors was held at a local movie theater, complete with drinks and snacks. After the premiere, the videos were posted to the college's online education portal for preceptors across the nation to access. Within the online portal, participants were required to create an account and register for the mini-series before they could watch any of the videos. They were asked several demographic questions to gain an understanding of their preceptor experience. After registration, participants gained access and were provided with a brief description of the mini-series followed by a list of the 12 episodes. To access an individual episode, the user could expand a tab to see the episode's objectives, preceptor pearls, reflection questions, and link to the video (Figure

1). After viewing each episode, participants were prompted to complete an evaluation. Once participants had completed and submitted the online evaluation, they were given 15 minutes of continuing pharmacy education credit. After participants completed an episode, they were given the opportunity to move on to the next episode in the mini-series or logout of the system and come back at a later date.

Qualitative and quantitative outcomes were collected through a comprehensive evaluation process. Descriptive statistics were calculated to summarize sample demographics and outcome measures of the mini-series (ie, attitudes toward the program, word count as a proxy indicator of program engagement, and level of confidence). General linear mixed modeling was used to

examine between-group variability in each outcome while accounting for the fact that participants (Level 2) were repeatedly measured on different episodes (Level 1). In addition, a paired-samples *t* test was performed to compare the confidence level prior to and after viewing the mini-series episodes. All quantitative analyses were conducted using SAS, version 9.4 (SAS Institute, 2002–2012). This project was submitted to the Institutional Review Board (IRB) for review and was deemed to be a quality assurance project.

EVALUATION AND ASSESSMENT

The mini-series was released in May 2014 and made available online to preceptors all over the country. The program was free to all Texas preceptors, and \$30 for all other preceptors to obtain three hours of continuing education. No formal recruitment efforts were made. To make individual preceptors aware of the program, an advertisement was placed on the Texas Society of Health-System Pharmacists organization website and emails were sent by the vice chair of experiential programs to all TTUHSC SOP preceptors and to one experiential administrator at each US college and school of pharmacy.

At the time of online registration, all participants were required to provide some basic demographic information. This included if they were full or adjunct faculty members; the state where they precepted; how long they had served as a preceptor; if they precepted students, residents, or both; the average number of students and/or residents they trained in a given year; how many hours of preceptor-specific training they completed each year; and the schools and college for which they precepted.

In order to determine the effectiveness of the mini-series, an evaluation process was developed based on the framework of Kirkpatrick's Four-Level Training Evaluation Model (Figure 2).¹⁶ Figure 2 provides an explanation of the four levels of the model and shows the hierarchical relationship among the levels, with level 1 being the most basic, and level 4 being the most comprehensive. The evaluation framework was designed to reach Level 3: Behavior. The relationship between the mini-series evaluation instruments and the first three levels of Kirkpatrick's evaluation model are described below.

The Reaction level pertains to the learner's affective reaction to an instructional program. A six-item reaction instrument was developed to measure participants' attitudes toward each episode of the mini-series (Appendix 1). The first section of the instrument contained items designed to assess attitudes about content relevance, teaching strategy, assessment strategy, and program length. To complete these items, participants responded to positively worded statements by marking their responses on a five-point Likert scale ranging from strongly disagree to strongly agree. The second section of the instrument contained two dichotomous (yes/no) items designed to assess whether participants would participate in similar learning activities in the future; and recommend the learning activity to colleagues.

The Knowledge level pertains to how much learners learned as a direct result of an instructional program. Two knowledge-level evaluation instruments were developed for each episode of the mini-series: two pre- and two post self-assessment questions and three reflection questions. The self-assessment and reflection questions were

Level 4: Results

Increased efficiencies, decreased costs, increase revenue, improved quality. Better morale, increases retention, and loyalty to the company. Frequently thought of as "bottom line" results. This measures the success of training in terms executives understand.

Level 3: Behavior

How did your performance or behavior change due to the training provided? Requires important decisions when and how to evaluate.

Level 2: Knowledge

What did you learn? Pre (before training) and post (after training) measurement

Level 1: Reaction

How did you feel? Did you like it? How was the environment? How was the facilitator? Was the content relevant?

Figure 2. Kirkpatrick's Four Level Model For Training Course Evaluation.¹⁶

directly aligned with the episode objectives. The pre- and post-assessment items required participants to rate their level of confidence concerning their mastery of specific objectives prior to and after completing the instruction. To complete these items, participants responded to positively worded statements by selecting their responses on a three-point scale ranging from not confident to very confident. Both the pre- and post-assessment items were administered after each mini-series episode. This approach was similar to a traditional “self-report” pretest-posttest except that the pretest is given after the treatment.¹⁷ Respondents reflect back to their state prior to the treatment and determine whether they have undergone a change.¹⁸ In a traditional “self-report” pretest-posttest, respondents often overestimate their level of knowledge on a particular subject when taking the pretest.¹⁹ With the retrospective pretest, respondents first learn how much they know about a subject prior to responding to a questionnaire.¹⁹

The Behavior level pertains to the learner’s ability to apply what they have learned from an instructional program by exhibiting relevant behaviors in a real-world setting. The mini-series addressed the Behavior level by

asking participants to complete a follow-up survey administered between three and six months following completion of all 12 episodes. This survey contained self-assessment questions aligned with the objectives of the mini-series. These items employed the same three-point scale as the self-assessment instrument administered during the Level 2 evaluation (ie, “Knowledge”). The survey also contained an open-ended item asking participants to provide further information about the impact of the mini-series on their practice as a preceptor.

In the nine months after the release of the program (May 2014-February 2015), 232 participants registered and completed a minimum of one episode of the mini-series. Of those participants, 202 (87.1%) had completed all 12 episodes. The following results are focused on the participants who completed the entire series. Table 2 shows the demographic characteristics of this sample. The majority of the participants were adjunct faculty preceptors (134, 66.3%), had less than six years of preceptor experience (117, 57.9%), served as a preceptor for one or two students/residents per year (102, 50.5%), and completed two to three hours of preceptor training each year (116, 57.4%).

All data was stored internally within our online learning management system (Learning Express) that allowed us to track and verify the accuracy of individual participation. Only one third (59) of the participants completed all 12 episodes consecutively, in a single three-hour time period; 49 (24.3%) did so in a day, 35 (17.3%) within a week, and 53 (26.2%) in a month or longer.

Using a five-point scale ranging from 1=strongly disagree to 5=strongly agree, the participants evaluated whether the mini-series was appropriate in terms of the content (4.6 ± 0.4), teaching strategy (4.6 ± 0.4), reflection questions (4.5 ± 0.5), and length of the episodes (4.5 ± 0.5). Also, 201 (99.5%) of the participants stated that they would complete a similar program and that they would recommend the mini-series to others. Moreover, the general linear mixed modeling (GLMM) analysis showed that participants with more than 10 years of preceptor experience expressed significantly more positive attitudes toward the content compared to those with less than 1 year of experience (Table 3).

The word count of the responses to each reflection question was analyzed as a proxy measure of the participants’ engagement in the mini-series. For all 12 episodes combined, the participants responses averaged 25 words for each of the first two questions with the third question averaging 13 words ($M \pm SD = 25.2 \pm 23.1$, 25.3 ± 24.2 , and 13.3 ± 10.4). The GLMM analysis indicated that the participants with less than one year or one to five years of preceptor experience provided

Table 2. Demographic Characteristics of the Participants

Variable	N	%
Title		
Full-time faculty preceptor	29	14.4
Adjunct preceptor	134	66.3
Not yet a preceptor	39	19.3
Preceptor experience		
0-1 years	54	26.7
1-5 years	63	31.2
6-10 years	41	20.3
>10 years	44	21.8
Number students and/or residents per year on rotation ^a		
1-2	102	50.5
3-5	44	21.8
6-10	23	11.4
>10	18	8.9
Hours of preceptor training per year		
0 hour	31	15.3
1 hour	18	8.9
2-3 hours	116	57.4
>3 hours	37	18.3

^aThere were a total of 202 participants that completed all 12 episodes of the mini-series. Fifteen individuals did not answer the question regarding students and/or residents, which resulted in only 187 respondents. This may be a result of some participants never having a student and/or resident on rotation before and so they may have chosen not to answer the question since “no learners” (0) was not an answer listed

Table 3. Results of General Linear Mixed Modeling

	Dependent variable								
	Content			Teaching strategy			Reflection questions		
Fixed effect	Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>
Intercept	4.7	0.07	<.001	4.7	0.07	<.001	4.6	0.07	<.001
Preceptor experience									
0-1 years	-0.20	0.09	.02	-0.22	0.09	<.01	-0.25	0.09	<.01
1-5 years	-0.09	0.08	.26	-0.09	0.09	.27	-0.14	0.09	.11
6-10 years	-0.13	0.09	.18	-0.12	0.09	.21	-0.16	0.10	.11
>10 years (ref.)	-	-	-	-	-	-	-	-	-
Random effect									
Intercept variance	0.18	0.02	<.001	0.18	0.02	<.001	0.20	0.02	<.001
Residual variance	0.11	0.003	<.001	0.08	0.002	<.001	0.11	0.003	<.001
	Length of the episodes			Word count for reflection question No. 3			Change in the confidence level		
Fixed effect	Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>
Intercept	4.6	0.08	<.001	10.9	1.11	<.001	-0.34	0.05	<.001
Preceptor experience									
0-1 years	-0.19	0.10	.07	4.22	1.49	<.01	-0.15	0.07	.04
1-5 years	-0.09	0.10	.35	2.83	1.44	<.05	-0.15	0.07	.03
6-10 years	-0.10	0.11	.36	1.61	1.59	.31	-0.15	0.08	.06
>10 years (ref.)	-	-	-	-	-	-	-	-	-
Random effect									
Intercept variance	0.25	0.03	<.001	48.9	5.42	<.001	0.10	0.01	<.001
Residual variance	0.10	0.003	<.001	72.62	2.18	<.001	0.11	0.004	<.001

SE = standard error

Note: The participants with more than 10 years of preceptor experience were used as the reference group. Thus, the intercept is equal to the *estimated mean* of the dependent variable for those in this group. The “change in the confidence level” dependent variable was calculated by subtracting the post-program value from the pre-program value. For this variable, therefore, the *negative* intercept estimate indicates an *increase* in the mean confidence level after the program completion for those in the reference group. The intercept variance represents the variability of the intercept estimate across individuals; and the residual variance represents the unreliable variance in the dependent variable (ie, random error in prediction)

significantly longer comments to question 3 (“List one thing you learned during the program that you intend incorporating into your rotations with students?”) than those with more than 10 years of experience (Table 3). However, there were no significant between-group differences with regard to the length of responses to the other two reflection questions. When reviewing the participants’ responses to reflection question 3, 87% of the time the responses matched the learning objective for an episode in the mini-series.

Prior to the mini-series, the participants reported a confidence level of 1.9 ± 0.4 (where 1=not confident to 3=very confident) for all 12 episodes combined. After the program completion, participants’ confidence levels increased to a mean of 2.3 ± 0.4 . This change was significant ($t=17.85$, $p<.001$) as well as substantial in size (Cohen’s $d=1.39$). Similar results were observed for individual episodes, ie, significant and large increases in the confidence level ($t=10.6-14.2$, all $p<.001$, $d=0.85-1.1$). Further, the GLMM analysis revealed that the participants

whose preceptor experience was less than one year (marginal $\Delta M \pm SE = 0.49 \pm 0.05$) or one to five years (0.5 ± 0.04) achieved a significantly greater increase in their confidence compared to those who had more than 10 years of preceptor experience (0.3 ± 0.1) (both $p<.05$; Table 3).

The participants reported an overall confidence level of 2.6 ± 0.4 at the three-month follow-up survey. This was in fact a substantial increase from their confidence level at program completion ($M \pm SD = 2.3 \pm 0.4$). They also reported large increases in their comfort level for precepting at 3 months after program completion (6.8 ± 2.2) (where 1 = no increase, and 10 = big increase).

DISCUSSION

The purpose of this quality improvement project was to develop an innovative, entertaining, and flexible continuing education training program and to evaluate both its immediate and long-term impact on participant’s

preceptor abilities. The mini-series proved to be both engaging and entertaining. Using reflection question word counts as an indirect measure, authors concluded that the average of more than 20 words (one to two sentences) per question suggests a high level of engagement by participants. As for entertainment value, 99% of the participants recommended the mini-series to others and would complete a program in a similar format again. Only 32% of the participants completed the program within the three-hour session it was designed for, while 43% of the participants completed it in two days to three months. Such variation in the completion time exemplifies the flexibility of the mini-series. These findings support the success of the mini-series in reaching its targeted objectives. Of interest, the more experienced participants demonstrated significantly more favorable attitudes toward the mini-series but a lower level of engagement than did the less-experienced participants. We hypothesize that more experienced users in their career had been exposed to other preceptor training mediums they did not find beneficial and thus were able to compare the mini-series to these other programs unlike less-experienced users. As for level of engagement being higher among less-experienced participants, this may be due to these individuals being exposed to preceptor-student scenarios for the first time and thus provoking more thought and reflection than experienced users who have maybe “been there and done that.”

Over the years, numerous modalities have been used to provide preceptor training. Unfortunately, very little data has been published to support their use and few head-to-head studies exist to conclude one modality is more or less effective than another. It appears the circumstances of when, how, and for whom it is used will determine its impact. A “blended” learning model is a learning design that combines at least two delivery modalities and may include multiple instructional strategies within each program. Although not conclusive, findings from a recent meta-analysis suggest this model is at least as effective, if not more effective than non-blended strategies.²⁰ Given the diversity of individual approaches to learning, we believe blended learning has the potential to more successfully reach a broader audience. Although this cannot be definitively said, the mini-series did provide content in both written and video formats.

Online programs like the mini-series can take several different formats. Some institutions’ online programs consist of recorded live programs that are made available to participants who were unable to attend the original event. Often these recorded programs are of poor quality and do not engage the learner. Online modules are also becoming more popular. There is wide variety of modules

that have been developed for preceptor training, ranging from very basic (click from one page to the next)²¹⁻²⁵ to complex (interactive games, quizzes, videos, animation, etc).²⁶ Unfortunately there is a paucity of research articles on online teaching modules that would help to determine which format is best. Time to complete modules tend to range from a few minutes to several hours depending upon the complexity of the module. Regardless of module design, they appear to be an effective medium to teach learners “content knowledge” as did our mini-series program.

Advantages to online programs like the mini-series include ease of access, convenience, consistency of program content, efficient means of training preceptors, and flexibility for participants to complete at a time convenient to them. The mini-series was self-paced and flexible, meaning participants could start and stop when they needed to. Tracking data can also be a positive attribute of online programs and it may be accessed for record keeping, making content revisions, and evaluating the effectiveness of programs (quality assurance) which was the intent of our project. Some reported disadvantages include participants not having sufficient computer skills or a desire to complete a continuing education program online. There may be a lack of computers onsite and technology problems often occur. Start-up costs are very high and technology support is necessary, which we too have experienced.

Preceptors’ level of confidence in their teaching abilities significantly increased immediately after completing each of the 12 episodes in the series. A follow-up survey administered three months after completing the entire program also demonstrated a positive impact on preceptor learning based on participant self-reflection. There was no clear association between type of preceptor (adjunct or full-time faculty member) or average number of preceptor training programs completed in previous years and the outcomes of the mini-series. There have not been a lot of studies looking at long-term retention of knowledge and/or long-term impact of continuing education programming, which is important when significant time and resources are committed to training strategies.

One limitation of the project was the script was conceptualized and written by one academic pharmacist, which may have led to a more narrow focus based on a single individual’s experience/expertise. For future mini-series, a team of individuals will be recruited to write various aspects of the program based on their predetermined expertise and/or interests. The Southeastern Pharmacy Experiential Education Consortium (SPEEC) was very successful in collaborating on the development

of a preceptor training series and their efforts could be considered as a model for future script development.²³ Our assessment techniques were appropriate for the mini-series but were also somewhat limiting. Future projects will provide additional interactivity for the learner and include more measures to assess the effectiveness of the program. The reflection questions required participants to respond to open-ended questions aligned with the episode objectives. The reflection questions were thought provoking and provided participants with an experience that surpassed a one-dimensional learning experience. The reflection questions required active participation of the learner to relate the content to their experiences or a hypothetical situation. By requiring participants to think about a particular situation and how it would apply to them or their practice, they were able to process the educational content in a way that enabled them to more easily apply the content in their role as a preceptor. However, a post-review of reflection questions determined that not all questions were appropriate for each individual episode. More rigor will be used in development of future reflection questions. Evaluation questions for the series were developed by the authors, and no formal validity study (ie, content validity or face validity) was conducted. We recognize the potential limitation of this, in that it is possible that our final evaluations may not have clearly measured what was intended. For the three-month follow-up we did not ask participants whether they had precepted students in between completion of the program and time of follow-up, and that may limit the validity of our positive findings. Future strategies will collect this information to better determine whether the mini-series had an actual impact on preceptor's clinical teaching. Additional mini-series analyses will determine whether preceptors' perceptions of the program are influenced by their requirement to pay for the CE resources versus complete them for free.

To date, preceptors from 26 different states in which we do not routinely offer rotations have successfully completed all 12 episodes of the online mini-series. Given there was very limited recruitment of preceptors outside of TTUHSC SOP and preceptors were required to pay \$30 to complete the series (3 hours of CE) we were pleasantly surprised of this. This supports the potential transferability and use of the mini-series product to other institutions.

As reported in the results section, no differences were found based upon any demographics of the registrants. Thus, we have shown the online version of the product to be successful in several regions of the United States. Alternatively, if a college or school of pharmacy was interested in creating a new mini-series from

scratch, they could potentially face many challenges that could contest the workability or practicality of the mini-series format. These include but are not limited to the cost of filming and postproduction of the product, and the time required to conceptualize the theme, write the script, cast the actors, and coordinate production. To be successful, a significant number of individuals and resources would need to be allocated to the process. Even given these obstacles, they could be overcome through a coordinated effort of "pooling" resources (individuals and dollars) from multiple colleges and schools of pharmacy. With the development of the "consortium model" in pharmacy education, many regions of the country have created organized groups consisting on several colleges and schools who share a common geographic area. These consortiums could provide a great opportunity to meet the challenges of creating an entertaining CE video series. An example of the potential success of this model has been published. This consortium of five pharmacy schools from two states worked together to develop five online preceptor training modules.²³ If this model were to be adapted to the "mini-series" concept, one could project that similar success could be achieved.

At the time of writing this manuscript, three additional 12-episode mini-series ("The Reason I Jump: An Interprofessional Mini_Series", "Adventures in Interprofessional Precepting" and a "Change of Heart: An Interprofessional Series") and two six-episode mini-series ("A Resident Preceptor's Experience: It's Not as Easy as it Looks" and "A Glimpse Into the Life of a Community Pharmacy Preceptor") have been created (Table 4). The development of each new mini-series has been modified based upon experience from previous ones. For the latest 12-episode programs we added student experts to the preceptor experts and have created a product that is effective in not only training preceptors but preparing students for practice experiences. The new interprofessional mini-series not only embedded student experts into the design, but also were developed to train a diversity of health care professionals including pharmacists, physicians, nurses, speech-language pathologists, occupational therapists, and physical therapists. Similar evaluation strategies are being used to assess the effectiveness of each of the new online mini-series that are developed.

As mentioned earlier, multiple formats are created with each mini-series product, including the online individual episodes (which was the focus of this manuscript); a single feature movie (all 12 episodes back to back); and individual episodes to be presented and reflected on in a large classroom environment. We are in the process of evaluating each of these formats for each mini-series to

Table 4. Links to Movie Trailers of Programs Developed With Mini-Series Concept

Title of Mini-Series (Year Produced)	Description of Mini-Series and Link to Movie Trailer
“Preceptor PharmTools” (2014)	<p>This 12-episode series follows a young pharmacy preceptor and two students through a 6-week clinical rotation at a hospital. The two students are polar opposites and present unique challenges to the preceptor. https://www.youtube.com/watch?v=1nq4HzQHc50</p>
“Adventures in Interprofessional Precepting” (2014)	<p>This 12-episode series follows three health professional preceptors including a nurse, pharmacist, and physician as they precept their students in an interprofessional ambulatory care setting. Through a combination of poor and quality interactions, the interprofessional competencies of values and ethics, roles and responsibilities, communication, and teamwork are discussed. https://youtu.be/bZ0jC6C-6WU</p>
“A Resident Preceptor’s Experience: It’s Not as Easy as It Looks” (2015)	<p>This 6-episode series focuses on residency accreditation standards, the four major preceptor roles (direct instruction, modeling, coaching, and facilitation), and the concept of continuous residency program improvement. Interactions between a resident, their preceptor, and residency program director are highlighted as they progress through a hospital clinical rotation. https://www.youtube.com/watch?v=PbItUWY28IM</p>
“A Glimpse Into The Life of a Community Pharmacy Preceptor” (2015)	<p>This 6-episode series highlights both positive and negative interactions between a student, preceptor, patients, and technicians during a community pharmacy experience. The principles of orientation, feedback, and teamwork are discussed. https://www.youtube.com/watch?v=q3hgaECcFf0</p>
“A Change of Heart: An Interprofessional Mini-Series” (2015)	<p>The series follows multiple health professional preceptors including nurses, pharmacists, physicians, speech-language-pathologists, occupational therapists, and physical therapists as they precept their students in both a hospital and extended care setting. As a result of a medication error, the life of a patient is transformed in this series and you firsthand experience his trials and tribulations. https://www.youtube.com/watch?v=I1i79XDQHB4</p>
“The Reason I Jump: An Interprofessional Mini-Series” (2016)	<p>The series follows multiple health professional preceptors including pharmacists, physicians, speech-language-pathologists, occupational therapists, athletic trainers, and emergency medical services as they precept their students. The story follows the life of a star college track athlete who is attempting to make it the Olympic trials in the long jump and the difficulties his girlfriend, mom, and he face during his journey. https://youtu.be/r63fS3_w5HM</p>

determine which, if any format proves most effective for teaching purposes.

Regardless of preceptor methodology used, the new ACPE standards have increased focus in this area and colleges and schools will soon be experimenting with new preceptor training strategies. The experiential world is challenged to develop studies with rigor and help to identify the most beneficial approach. Most likely it depends on both the individual and type of content being delivered to know which method is best. However, experiential education colleagues need to work together as an academic community to shed more light on this area. Many preceptors have received very little training on how to teach yet they are expected to take an increasing number of students. There is a concern that if time and resources are not devoted to this important initiative, the quality of experiential training around the country could be negatively impacted. It is also critical that those in upper administration recognize this important need and provide the appropriate resources (financial, personnel, etc) for it to be successful.

CONCLUSION

The level of confidence of preceptors significantly increased as a result of completing the mini-series and accompanying assessment materials, both immediately after completing the program and 3 months later. The more experienced participants demonstrated significantly more favorable attitudes toward the mini-series but a lower increase in their confidence and a lower level of engagement than did less-experienced participants. The mini-series outcomes (confidence, attitudes, and engagement) were not associated with the type of preceptor and the average hours of preceptor training in previous years. Feedback from the mini-series provides evidence of the effectiveness of the concept and use as a preceptor learning tool. Future education initiatives that use the mini-series model will be performed to gain a better understanding of the role and scope of combining entertainment with education as it relates to preceptor training.

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Appendix 1. Participant Attitude (*Reaction Level*) Questions

1. The content of the learning activity was relevant to my role as a preceptor.
2. The teaching strategy (ie, video) was appropriate for content delivered.
3. The reflection questions were appropriate for this learning exercise.
4. The length of the video was appropriate
5. Would you participate in future learning activities utilizing this same video format?
6. Would you recommend this continuing education activity to a colleague?

Note: These same 6 questions appeared on the evaluations of each episode. In addition to these questions, each evaluation also included 2 pre and 2 post-test knowledge questions and 3 reflection questions which, unlike the participant attitude questions, were different for each episode and based on objectives.