

Can Distance Learning Fulfill Program Structure and Access Needs of Pharmacists for Post-B.S. Professional Education?

Mayur M. Amonkar
Virginia Scott
Suresh Madhavan

ABSTRACT. Continuing education, certificate programs, and nontraditional Pharm.D. programs afford practicing pharmacists the opportunity to continue enhancing their knowledge and skills to face the challenges of an ever-changing health care environment. While the content and topics offered through such programs are important, it is also important to structure programs in a convenient and cost-effective manner so as to benefit the greatest number of pharmacists. The overall goal of this study was to address ways to fulfill program structure and access needs of West Virginia pharmacists with regard to continuing education programs, certificate programs, and the nontraditional Pharm.D. program and to assess how emerging educational and distance learning technology can best be used to meet those needs. Data gathered via mail survey of 2,800 West Virginia University School of Pharmacy alumni and pharmacists licensed in West Virginia indicated varying levels of interest in

Mayur M. Amonkar, Ph.D., is Assistant Professor in the Department of Pharmaceutical Systems and Policy at the West Virginia University School of Pharmacy, Robert C. Byrd HSC(N), P.O. Box 9510, Morgantown, WV 26506 (E-mail: mamonkar@hsc.wvu.edu). Virginia Scott, Ph.D., and Suresh Madhavan, M.B.A., Ph.D., are Associate Professors in the Department of Pharmaceutical Systems and Policy, West Virginia School of Pharmacy.

This study was supported by the West Virginia University School of Pharmacy. The authors acknowledge the assistance of D. P. Elliott, K. Jozefczyk, G. W. Leader, D. B. Lucas, L. J. Moherman, S. A. Rosenbluth, E. J. Scharman, G. R. Spratto, and R. Watkins.

the three types of programs. Preferences for structuring the three types of programs based on characteristics such as method of instruction, class scheduling, traveling time, and willingness to pay were reported. While there appears to be a gap between pharmacists' preferences for program structure and access and what distance learning has to offer by the way of reduced travel time and distance, greater ease in managing family responsibilities, and greater flexibility in work schedules, this gap can be minimized through increased awareness and availability of education by distance learning means. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: <getinfo@haworthpressinc.com> Website: <<http://www.HaworthPress.com>> © 2001 by The Haworth Press, Inc. All rights reserved.]

KEYWORDS. Professional education, distance learning, pharmacists' needs, continuing education, nontraditional Pharm.D.

INTRODUCTION

Pharmacy is a practice-oriented profession with a continually expanding body of knowledge. New drugs and changing treatment modalities for disease demand that practicing pharmacists stay current with the latest developments in health care. Various educational programs are offered that allow pharmacists to continue enhancing their knowledge and skills while maintaining their practice. Three common types of programs include continuing education, certificate programs, and nontraditional Pharm.D. programs. Continuing education programs include hours of didactic or workshop training or self-study that pharmacists are required by all but two state boards of pharmacy to complete each year as a means of keeping up with changes in pharmacy practice and to maintain their licenses. A certificate program may be a single course or series of courses composed of didactic and experiential components of sufficient depth and duration to ensure mastery of a content area (1). A nontraditional Pharm.D. program, a modified version of the full-time Pharm.D. program, provides the opportunity to complete the didactic component at or near the participant's home (while maintaining full-time employment) or on-campus and the experiential component that can be arranged around one's work schedule (1). Continuing education credits may also be given for some of the hours spent for a certificate program and for certain courses of the nontraditional Pharm.D. program.

While the content and topics offered through such programs are important, it is also important to structure the programs in a convenient and cost-effective manner so as to benefit the greatest number of pharmacists. These programs have to be available on days and at times convenient to working pharmacists in locations that are easily accessible or in formats that allow self-paced learning. The emergence of personal computers in the last decade or so and the rapid changes in educational technology have created new opportunities for delivering educational programs right into pharmacists' homes. This and any other type of educational experience in which distance and/or time separate the instructor from the learner (student) are referred to as distance learning (2). Electronic media is commonly used as the primary source of communication in today's distance learning environment. Commonly used distance learning technologies and strategies include two-way audio teleconferences, prerecorded video telecourse, audiographics, computer-based courses (via the Internet), desktop video, one- and two-way videos, interactive television (two-way audio and video), and any combinations of the above (2).

Distance learning has and continues to be used effectively in various settings. The literature has yielded numerous articles on the successful use of distance learning in nursing education. The College of Nursing at the University of New Mexico offers an R.N.-B.S.N. outreach program via two-way audio, one-way visual satellite transmission (3). Since its founding in 1988, more than 200 R.N.s have earned their B.S.N. through this part-time program of study. Johns Hopkins University and other prestigious universities such as Cornell, Duke, and Stanford are constantly expanding their distance learning operations (4). The U.S. Army National Guard is in the process of converting more than 3,000 sites across the country into high-tech, interactive distance learning centers (5).

A few schools and colleges of pharmacy have also begun to use distance learning technology to deliver courses developed for nontraditional Pharm.D. programs. In 1996, the University of North Carolina employed printed materials, videotapes, and interactive videoconferencing to deliver an applied pharmacokinetics course to 54 full-time practitioners throughout the state (6). Albany College of Pharmacy contracted with the New Jersey Institute of Technology, in 1995, to offer a drug information related course to its external Pharm.D. students (7). Lectures were delivered via audiotape while the journal club component of the program was conducted on-line using a telecommunications network. As more schools and colleges of pharmacy look to invest in

this new technology for the purpose of providing postgraduate educational programming, there is a need to determine to what extent this technology lends itself to meeting the special needs of practicing pharmacists.

STUDY GOAL

The overall goal of this study was to address ways to fulfill program structure and access needs of West Virginia pharmacists with regard to continuing education programs, certificate programs, and the nontraditional Pharm.D. program and to assess how emerging educational and distance learning technology can best be used to meet those needs. To achieve this goal, it was necessary to identify levels of interests and preferences for structuring of continuing education programs, certificate programs, and the nontraditional Pharm.D. program with respect to:

1. Preferred methods of instruction—to determine which teaching format is most preferred for continuing education, certificate programs, and the nontraditional Pharm.D. degree from among video and audiotapes, Internet, written material (handouts and textbooks), live lectures, interactive television, and telephone conferencing
2. Scheduling preferences (when, where, how long)—to determine preferences for issues such as time of year, day of week, and time of day most convenient for class meetings; location or setting for meeting; and length of time available to meet
3. Traveling preferences—to determine preferences for issues such as maximum travel time willing to spend to go to class, frequency of traveling to attend class, and willingness to travel to a central location
4. Willingness to pay—to estimate the amount one would be most willing to pay to attend the various types of educational programs.

METHODS

A self-administered mail survey was considered to be the method of choice for collecting the information needed to accomplish the goal of this study. Four previously administered surveys (Midwestern University-Chicago College of Pharmacy, University of Texas at Austin, Ohio

State University, and the Pennsylvania Society of Health System Pharmacists) were used in developing the survey for this study (1, 8-10). The study population to be surveyed comprised all West Virginia University School of Pharmacy alumni and pharmacists licensed in West Virginia, for a total of 2,800 pharmacists. Mailing lists were obtained from the School of Pharmacy Development Office and the West Virginia Board of Pharmacy for alumni and registered pharmacists, respectively. The two lists were reviewed to identify and eliminate duplicate names.

Structurally, the instrument consisted of four sections. The first page of the survey included a cover letter that explained the purpose of the study and the importance of participation. Sections A through C were designed to collect information on the perceptions and preferences for optimal structuring of the three post-B.S. educational programs: continuing education, certificate programs, and the nontraditional Pharm.D. program. Section D was designed to collect information on demographic and practice characteristics. Respondents were asked to complete the various sections based on their interest in the three programs. Additionally, definitions of the types and components of the three programs were provided in the survey for respondents to bear in mind when completing the survey.

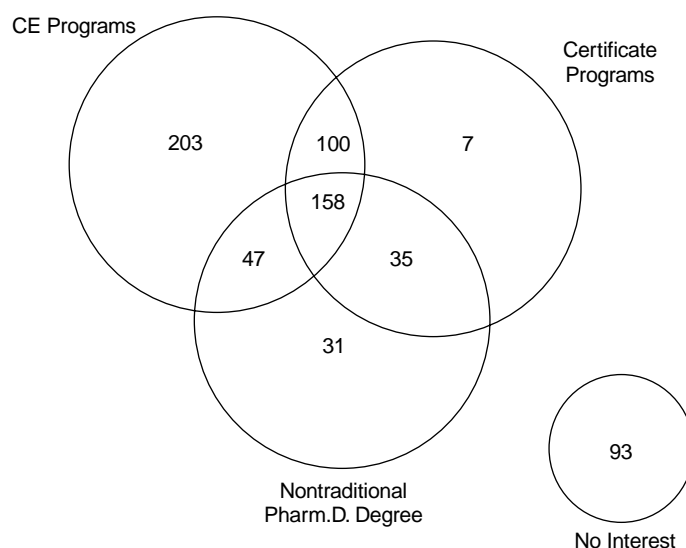
The initial mailing of the survey (done in November 1996) and a postage-paid business reply envelope was followed in 12 weeks by a second mailing of the survey to nonrespondents. All data input, formatting, transformation, and analyses were performed using the Statistical Package for the Social Sciences (SPSS®) for Windows. Descriptive statistics in terms of means, standard deviation, and frequency distributions were used for determining the preferences for the structuring of the three programs.

RESULTS

Survey Response and Levels of Interest in Post-B.S. Education

A total of 674 usable responses were received after both mailings. Thus, the net response rate was calculated to be 24%. Varying levels of interest were shown for the three types of programs (Figure 1). Respondents were given seven program options and asked to select the program option that they would be most likely to enroll in within the next year or two. More than 75% of the respondents were interested in continuing education programs, while almost 45% showed interest in certificate programs. Among the three programs, the least amount of

FIGURE 1. Number of Respondents Showing Interest in the Various Program Offerings.



Total Responses Obtained = 674 (24.1% response rate)
 Interest in CE Programs = 508 (75.4%)
 Interest in Certificate Programs = 300 (44.5%)
 Interest in Nontraditional Pharm.D. Degree = 271 (40.2%)

interest was shown for the nontraditional Pharm.D. program (40%). About 14% of the respondents had no interest in any of the programs. Almost 36% of the respondents showed interest in a single program, 27% in a combination of 2 programs, and 23% in all 3 programs.

Since the study population included pharmacists who were WVU alumni and West Virginia licensed pharmacists not residing in West Virginia, responses were also obtained from pharmacists practicing in other states. However, the majority (75.3%) of respondent pharmacists practiced in West Virginia, while almost 25% of pharmacists practiced in other states. Among the other states, Pennsylvania, Ohio, Maryland, and Virginia represented a greater percentage of responses. Thus, the results of this study can be generalized to WVU alumni and West Virginia licensed pharmacists practicing within and outside West Virginia. Since no study has shown West Virginia pharmacists to be different from pharmacists in other parts of the country, results may definitely be useful in understanding the preferences of the rest of the pharmacist population.

Nonresponse Bias Analysis

Because the response rate was lower than optimal, nonresponse analysis was performed to determine if there was any bias in the data collected (i.e., Did the pharmacists who responded to the survey differ from those who did not respond even after two mailings?). The extrapolation method of estimating nonresponse bias, which assumes that those who respond late are more like nonrespondents and hence can be compared to the early respondents, was used for this study (11).

The first one-third of pharmacists who responded after the first mailing of the questionnaire were classified as early respondents, while the last third of pharmacists who responded after the second mailing were classified as late respondents. Nonresponse bias was assessed by comparing early and late respondents on selected demographic and practice characteristics using chi-square tests of independence. Results showed no significant differences between the two groups (Table 1). Thus, nonresponse bias analysis did not warrant any adjustment or transformation of the data.

Demographic and Practice Characteristics

Demographic and practice characteristics of the respondents on an overall basis and based on interests for enrollment in the three programs are provided in Table 2. On an overall basis, respondents were predominantly male, married, approximately 41 years of age, employee or staff pharmacists, practicing in a community setting (independent or chain), working more than 40 hours a week, and spending a majority of their time in dispensing activities. When comparing interests across the three types of programs, respondents with an interest in the nontraditional Pharm.D. program and certificate programs were younger than those with an interest in continuing education (CE) programs. Since the groups showing an interest in the three types of programs were not mutually exclusive, statistical comparisons could not be made across them. Also, a higher percentage of respondents with an interest in the nontraditional program practiced in a hospital setting than respondents with an interest in the other two types of programs.

Preferences for Structuring the Three Types of Programs

Results of pharmacists' preferences for structuring of the three types of post-B.S. educational programs are provided in Tables 3-7. For CE

TABLE 1. Nonresponse Bias Analysis.

Characteristic	Early Respondents	Late Respondents	Chi-Square	Signif.*
Gender	212	213	1.576	0.209
Male	136	124		
Female	76	89		
Marital Status	208	211	0.039	0.844
Married	158	162		
Single	50	49		
Age	210	212	1.207	0.751
21-30 years	50	56		
31-40 years	52	49		
41-50 years	59	52		
>50 years	49	55		
Practice Site	210	215	2.980	0.561
Community (chain)	74	70		
Community (independent)	40	45		
Hospital	48	46		
Other (home health, academia, etc.)	42	41		
Not employed	6	13		
Position	200	194	1.267	0.737
Employee/Staff Pharmacist	92	98		
Managerial	52	42		
Clinical & Other	36	36		
Owner/Partner	20	18		

Early respondents were the first 225 pharmacists who responded.

Late respondents were the last 224 pharmacists who responded.

*Significance tested at 95% confidence level ($p < 0.05$)

and certificate programs, live lectures, written materials, and video were the three most preferred methods of instruction (Table 3). Pharmacists interested in the nontraditional program favored instruction through written materials, live lectures, and videos. For all three programs, audiotapes and teleconferences were the least preferred methods of instruction.

Preferences for structuring the three types of programs based on characteristics such as class scheduling, traveling time, and willingness to pay are summarized in Tables 4-6. Respondents with an interest in CE programs had no particular preference for the setting in which a program would be delivered, although a hotel or resort setting was preferred over a college setting (Table 4). They also had no particular preference for the time of year when they would attend such programs, although fall and spring were preferred over winter and summer. Saturday and Sunday mornings or afternoons and weekday evenings were

TABLE 2. Respondents' Demographic and Practice Characteristics.

Characteristic	Overall (N = 581)*		CE Programs (N = 508)		Certificate Programs (N = 300)		Nontrad. Pharm.D. (N = 271)	
	N	%	N	%	N	%	N	%
Gender								
Male	316	57.0	275	56.9	148	51.0	143	54.0
Female	238	43.0	208	43.1	142	49.0	122	46.0
Marital Status								
Married	416	76.5	361	76.3	212	74.6	202	77.4
Single	128	23.5	112	23.7	72	25.4	59	22.6
Age Group								
21-30 years	156	28.4	140	29.2	105	36.5	94	35.7
31-40 years	143	26.0	115	24	82	28.5	77	29.3
41-50 years	145	26.4	121	25.2	75	26.0	75	28.5
over 50	106	19.3	104	21.7	26	9.0	17	6.5
Mean	40.8		41.3		36.9		36.7	
S.D.	13.2		13.7		10.2		10.1	
Year License Obtained								
Before 1980	225	41.5	203	43	80	32.8	67	29.8
1980 to 1989	142	26.2	114	24.2	70	28.7	68	30.2
1990 and after	175	32.3	155	32.8	94	38.5	90	40.0
Practice Site								
Independent pharmacy	112	20.3	101	20.9	57	19.8	44	16.6
Chain pharmacy	191	34.5	172	35.6	101	35.1	100	37.7
Hospital	135	24.4	100	20.7	83	28.8	86	32.5
Other (home health, academia, managed care, etc.)	95	17.2	90	18.6	41	14.2	30	11.3
Not employed	20	3.6	20	4.1	6	2.1	5	1.9
Position Held								
Employee/Staff R.Ph.	266	50.1	236	51.1	150	52.8	136	51.9
Managerial	128	24.1	100	21.6	68	23.9	72	27.5
Clinical & other	88	16.6	81	17.5	38	13.4	34	13.0
Owner/Partner	49	9.2	45	9.7	28	9.9	20	7.6
Hours Worked Per Week								
Less than 40 hours	106	20.5	96	21.4	45	16.2	35	13.6
40 hours	176	34.0	144	32.1	101	36.3	98	38.1
More than 40 hours	235	45.5	208	46.4	132	47.5	124	48.2
Mean	40.3		40.1		41.8		42.3	
S.D.	13.1		13.5		11.4		10.0	
Activities Performed								
Clinical (e.g., consulting)		25.3		25.6		27.9		27.1
Dispensing		51.3		51.6		50.0		51.2
Financial (e.g., budgeting)		8.1		7.9		8.6		8.6
Personnel (e.g., training)		8.0		7.7		8.0		7.7
Others		7.3		7.2		5.5		5.4

*Of the total 674 responses, 93 were eliminated since they belonged to respondents with no interest in any program.

TABLE 3. Mean Score and Ranking of Preferred Method of Instruction Based on Program Interest.

Preferred Method of Instruction*	CE Programs		Certificate Programs		Nontrad. Pharm.D.	
	Mean	Rank	Mean	Rank	Mean	Rank
Live lectures	4.37	1	4.29	1	4.23	2
Written materials	4.10	2	4.25	2	4.29	1
Video	3.66	3	3.89	3	4.04	3
Computers (Internet, e-mail)	3.29	4	3.45	4	3.57	4
Interactive television	3.23	5	3.31	5	3.44	5
Audio tapes	2.68	6	2.70	6	2.83	6
Telephone conference	2.44	7	2.41	7	2.43	7

*Measured on a 5-point Likert scale where 1 = dislike very much and 5 = like very much

preferred days and times of the week for attending CE programs. The majority of respondents would be inclined to attend a CE program of a half-day duration and would not like to travel more than 100 miles to get to the program site. The majority of respondents would not spend more than \$75 to attend a 6-hour CE workshop.

For certificate programs, respondents had no particular preference for the time of the year when they would find it convenient to attend but had the least preference for attending in winter (Table 5). The preferred days of the week to attend a two-hour to three-hour instructional session were Thursday and Saturday. For a course of 40 to 60 hours, the scheduling alternative most preferred was to have classes and experiential activities on a combination of Saturdays and selected weekday evenings over a 5-week to 10-week period.

Respondents with an interest in the nontraditional program would prefer to spend up to ten hours per week on the didactic component (lectures, studying, and completing assignments), with Tuesday and Thursday evenings being preferred days and times to meet (Table 6). An eight-hour once-a-month meeting on Saturdays was also preferred for lectures, discussion, and testing. The majority of participants in such a program would be willing to travel less than an hour (one-way) to attend class and would be willing to do so once a week. For completing a 160-hour clerkship, an 8 hours per week for 20 weeks schedule was most preferred, while a 40 hours per week for 4 weeks schedule was least preferred. Almost one-third of the respondents would be willing to spend more than \$2,000 in tuition and fees per year to obtain the Pharm.D. degree. This amount does not include lost salary, books, travel, and supplies.

Table 7 provides a summary of the recommendations made for opti-

TABLE 4. Continuing Education Program Structure Preferences.

Program Characteristic	N	%
Setting for CE Program		
No preference	232	49.9
Hotel setting	78	16.8
Resort setting	69	14.8
College setting	40	8.6
Other	46	9.9
Time of Year		
Fall	126	24.8
Winter	86	16.9
Spring	143	28.1
Summer	96	18.9
No Preference	236	46.5
Day and Time of Week		
Saturday morning	219	43.1
Sunday afternoon	190	37.4
Saturday afternoon	186	36.6
Sunday morning	170	33.5
Tuesday evening	146	28.7
Thursday evening	146	28.7
Wednesday evening	144	28.3
Friday evening	142	28.0
Monday evening	134	26.4
Length of Workshop		
Half day	237	50.9
Full day	138	29.7
No preference	78	16.8
More than a day	12	2.6
Willingness to Travel for 1-Day Program		
Less than 50 miles	155	33.9
50-99 miles	191	41.8
100-149 miles	65	14.2
150-200 miles	25	5.5
Anywhere in state	21	4.6
Willingness to Pay for a 1-Day, 6-Hour Program		
Less than \$75	280	60.3
\$75 to \$99	126	27.2
\$100 to \$124	40	8.6
\$125 to \$149	9	1.9
\$150 to \$174	8	1.7
\$175 or more	1	0.2

TABLE 5. Certificate Program Structure Preferences.

Program Characteristic	N	%
Time of Year		
No preference	135	45
Spring	88	29.3
Summer	68	22.7
Fall	68	22.7
Winter	48	16
Day of Week		
Thursday	112	37.3
Saturday	107	35.7
Tuesday	102	34
Sunday	101	33.7
Wednesday	100	33.3
Monday	91	30.3
Friday	89	29.7
Scheduling Alternative		Mean*
Classes and experiential activities on Saturdays & selected weekday evenings (5-10 weeks)		2.00
Classes and experiential activities on selected weekday evenings only (10-20 weeks)		2.35
Classes and experiential activities on Saturdays only (10 weeks)		2.42
Full-time classes and experiential activities (40hrs/wk for 1-2 weeks)		3.19

*Measured on a 4-point Likert scale where 1 = most preferable and 4 = least preferable

mal structuring of CE, certificate, and nontraditional programs based on levels of interest and preferences of West Virginia pharmacists. A few similarities can be seen in structuring preferences among the three programs. For all three types of programs, live lectures and use of written materials are preferred methods of instruction, while use of audiotapes and teleconferences are least preferred methods. Also, organizing CE programs, certificate program workshops, and nontraditional program classes on Saturdays are preferred by interested respondents.

DISCUSSION

Although this study surveyed West Virginia University alumni and West Virginia licensed pharmacists, study results may be useful to understand the preferences of the rest of the pharmacist population. This is because the literature has not yielded any study or report to indicate that West Virginia pharmacists are unique and not representative of pharmacists elsewhere. In fact, recent studies conducted by the authors about pharmacists' attitudes toward and willingness to provide immunization in West Virginia and nationally yielded remarkably similar re-

TABLE 6. Nontraditional Pharm.D. Program Structure Preferences.

Program Characteristic	N	%
Hours Willing to Spend Per Week		
Less than 5 hours	27	10.6
5-7 hours	66	26.0
8-10 hours	111	43.7
11-13 hours	30	11.8
More than 13 hours	20	7.9
Traveling Time (One-Way)		
Less than 30 mins	50	19.8
31 mins.-1 hour	118	46.6
1-1.5 hours	52	20.6
>1.5 hours	33	13.0
Traveling Frequency		
Once a week	157	62.1
Twice a month	58	22.9
Once a month	16	6.3
Once every other month	10	3.9
Once a year	2	0.8
Not willing to travel	10	3.9
Willingness to Pay Each Year (Tuition & Fees)		
Less than \$500	17	6.7
\$501-\$1,000	31	12.3
\$1,001-\$1,500	62	24.6
\$1,501-\$2,000	60	23.8
\$2,001-\$2,500	51	20.2
More than \$2,500	31	12.3
Time of Day		
Morning	74	32.3
Afternoon	34	14.8
Evening	121	52.8
Time Available to Meet		
Less than 2 hours	12	4.9
2 hours	56	23.0
3 hours	93	38.3
All day	82	33.7
Day of Week*		
Monday		3.14
Tuesday		2.75
Wednesday		2.83
Thursday		2.80
Friday		3.47

TABLE 6 (continued)

Program Characteristics	N	Mean
Preferred Saturday Schedule**		
One 8-hr Sat. meeting each month (8 am-4 pm)		1.78
Two 4-hr Sat. morning meetings each month (8 am-12 pm)		2.29
Two 4-hr Sat. afternoon meetings each month (1 pm-5 pm)		2.76
Two 4-hr Sat. evening meetings each month (5 pm-9 pm)		3.30
Preference for Completing a 160-hr Clerkship***		
8 hrs./wk. for 20 weeks		3.75
16 hrs./wk. for 10 weeks		3.10
20 hrs./wk. for 8 weeks		2.46
40 hrs./wk. for 4 weeks		2.35

*Measured on a 5-point Likert scale where 1 = most desirable and 5 = most undesirable

**Measured on a 4-point Likert scale where 1 = very appealing and 4 = not appealing at all

***Measured on a 5-point Likert scale where 1 = very unwilling and 5 = very willing

sults (12-13). One would expect to see differences in the attitudes and practice culture due to differences in state practice laws and traditions. However, since there is mobility in the pharmacy workforce and the health care system is becoming increasingly dominated by national hospital and pharmacy chains, the professional practice and culture are, over time, going to become more similar. One can also intuit that the primary driving forces that dictate pharmacists' preferences for types of programs and their structure—such as family commitments, workloads, distance to education site, etc.—are going to be similar and not dictated by state of residence. All states (except two) have a mandatory CE requirement (mostly differing on number of hours and types of programs) for relicensing. Certificate programs are becoming popular as a means of credentialing for reimbursement for cognitive services, and many schools are transitioning from a B.S. to a Pharm.D. curriculum. It seems that there are several reasons to think that pharmacists would be similar in terms of preferences in many respects across states. However, it is advisable to be cautious and conservative while interpreting results of this study and extrapolating the findings to a larger population.

The survey results showed the highest degree of interest for continuing education programs, followed by certificate programs and the non-traditional program. This ranking of interests may be due to the fact that CE and certificate programs are likely to be more affordable, require less time commitment from the participant, and cause minimal disruption of the participant's work and family-related activities (1). The cur-

TABLE 7. Optimal Structuring of Post-B.S. Educational Programs.

Continuing Education Programs

No particular preference for setting and time of the year
 Could consider scheduling in a hotel setting during spring time
 Saturday and Sunday mornings and afternoon are preferred times to meet
 Weekday mornings and afternoon are not good times although weekday evenings seem convenient
 A half day workshop is most preferred
 Participants would prefer to travel less than 100 miles for a 1-day workshop
 Participants would prefer to pay less than \$75 for a 1-day program lasting 6 hours
 Live lectures and use of written materials are preferred methods of instruction
 Audio tapes and telephone conferences are least preferred methods of instruction

Certificate Programs

Schedule classes and experiential activities on Saturdays and selected weekday evenings (5-10 week commitment)
 No preference for time of year although spring time seems convenient
 Thursday and Saturday are most convenient times to schedule classes
 Mondays and Fridays are least preferred
 Live lectures and use of written materials are preferred methods of instruction
 Audio tapes and telephone conferences are least preferred methods of instruction

Nontraditional Pharm.D. Program

Participants would be willing to spend up to 10 hours per week on lectures, studying, and completing assignments
 Participants would be willing to travel less than an hour (one-way) to go to class
 Participants would be willing to travel once a week to attend class
 Most participants would be willing to spend more than \$1,500 per year in tuition and fees
 Completing a 160-hr clerkship in 20 weeks in 8-hour blocks per week is preferred
 Tuesdays and Thursdays are best in terms of availability for lectures, discussion, and testing
 Evenings are preferred as meeting times
 Participants can be available for 3 hours during days of meetings
 For Saturday classes, one 8-hour monthly meeting is preferred (8 am-4 pm)
 Live lectures and use of written materials are preferred methods of instruction
 Audio tapes and telephone conferences are least preferred methods of instruction

rent requirement for pharmacists to participate in CE to maintain their licenses may also be a reason for such ranking.

Any program that is developed to provide post-B.S. education to pharmacists should take into account the preferences and expectations shown for various components of the program—method of instruction, schedule (when, where, how long), traveling time and distance, and willingness to pay. This will ensure maximum interest, enrollment, learning, and satisfaction. There are two ways in which such learning can be provided: traditional classroom-based learning and distance learning. Based on the preferences indicated by respondents, traditional

classroom-based learning may not be the most appropriate way to address the educational needs of practicing pharmacists. For example, a preference for less travel time and distance, weekday evening and weekend morning meeting times, and noncampus settings for all three types of programs does not lend itself to classroom-based learning. In West Virginia, where 47 of the 55 counties are rural, and similarly in other rural areas of the country, considerable traveling would be required to get to a centralized location for attending classes. In West Virginia, such a physical access barrier can be overcome through use of a partnership established by the university with a community-based rural health education network that covers the entire state—West Virginia Rural Health Education Partnerships (WVRHEP) (14). WVRHEP consists of community-based training sites that enable students to learn health care skills from practicing providers. Thirteen training consortia link more than 200 training sites including hospitals, health centers, physicians' offices, and pharmacies in rural communities. Eighteen locations have learning resource centers (LRCs) with computer stations and library resources, ten of which are linked up with statewide educational programs through an interactive telemedicine network.

Is Distance Learning the Answer?

The preferences of the pharmacists for less travel time and convenient class scheduling may be influenced by factors such as job and family commitments and financial constraints. In other studies, pharmacists have cited job constraints and lack of time to attend formal courses as reasons for nonparticipation in continuing education (15-17). Is distance learning then the answer to overcoming some of these problems? Results of the survey do not show a high need for post-B.S. education through distance learning, since the commonly used methods of instruction in distance learning (Internet, web-based learning, interactive television, teleconferencing, and audiotapes) have been ranked low by respondents. There may be several explanations for this observation. First, a lack of awareness about the use of distance learning may be a factor, since distance learning in the arena of pharmacy has increased in popularity in only the last decade or so. This study was conducted to gather baseline data at a time when distance learning was not widely used as a means of providing continuing education to practicing pharmacists. Second, lack of exposure to such methods of learning may create apprehension and hesitancy to experiment with such educational techniques. Third, respondents may feel that keeping pace with the

changes in pharmacy practice is best done by learning through traditional and more familiar methods, such as live lectures and written materials (handouts, textbooks). Fourth, unpleasant experiences (e.g., downloading files, slow modem speeds) that individuals may have had with using distance learning technology in the past may have caused them to respond in this way.

Previous research on the success of distance learning in addressing the above-mentioned problems and producing desirable outcomes has shown mixed results. In a survey of pharmacists participating in a distance learning course on health screening, more than 80% of respondents completing the course found distance learning more enjoyable and more suitable than other methods of continuing education (18). Keck concluded that students learn as well at distant sites as in the regular classroom when assessed on outcome measures such as examinations scores, final course grade, and graduating GPA (19). On the other hand, McLeary and Eagan studied the effectiveness of delivery of courses over interactive television (20). Data for variables such as instructor's overall teaching effectiveness, provision of feedback about student progress, amount of material covered, and level of difficulty were compared between the distance learning mode of delivery and the conventional classroom-based course. No differences in achievement or acceptance by the students were observed. Dirr and other researchers state that variables such as motivation, prior knowledge, and opportunity are additional factors known to influence the choice of taking a course on- or off-campus and may significantly confound academic outcome measurements (21-23).

If distance learning is to become a mainstay for post-B.S. pharmacy education and if colleges and schools of pharmacy need to take up the challenge of providing such learning, then several tasks need to be completed. First, a needs assessment should be undertaken to determine the current level of knowledge, access to the necessary technology, level of proficiency in the use of technology, and concerns and barriers to distance learning among practitioners.

Second, it is important to determine the level of resources (technological, financial, personnel) available at the various institutions to provide distance learning and to consider programmatic and logistical issues such as curriculum, sites to be reached, student enrollment, and site visits. With the passage of the resolution of the House of Delegates of the American Association of Colleges of Pharmacy in July 1992 calling for all schools of pharmacy to implement the entry-level Pharm.D. curriculum, the traditional B.S. in pharmacy is being phased out (24). Hence, there will not be an endless supply of students seeking a nontra-

ditional Pharm.D. degree. This means that other opportunities must be assessed for providing distance education, such as continuing education and certificate programs.

Third, an educational initiative should be launched to create awareness about the advantages of distance learning, such as reduced travel time and distance, greater ease in managing family responsibilities, and greater flexibility in work schedules, and about the ease of using technology to obtain such learning. The Department of Pharmacy Care Systems at Auburn University's School of Pharmacy has initiated an intensive hands-on technology workshop (referred to as Virtual Technology Bootcamp) that teaches health care professionals from the U.S. and other countries aspects of daily computer use (25). It also employs the latest multimedia technologies in a web-based format to train students. Finally, distance learning programs should be initiated on a pilot scale with formative and summative evaluations conducted to determine their effectiveness in producing the desired outcomes, i.e., enhanced learning and student and faculty satisfaction.

In conclusion, there appears to be a gap between the needs of pharmacists and the use of distance learning and educational technology to meet those needs. But with the changing health care environment and technological advancements, it appears that distance learning is here to stay. Hence, more schools and colleges of pharmacy need to use distance learning and educational technology to structure postgraduate programs that would be more accessible to pharmacists in their homes or local areas. Distance learning and educational technology will allow practitioners to receive most current information in a timely manner and enable them to be lifelong learners by advancing their clinical and professional knowledge.

RECEIVED: 12/06/99
REVIEWED: 04/20/00
REVISED: 05/30/00
REVIEWED: 06/20/00
REVISED: 07/03/00
ACCEPTED: 07/06/00

REFERENCES

1. Hale KM, Gerald MC, Reuning RH. Assessment and comparison of interest in, commitment to, and perceived value of postbaccalaureate certificate and doctor of pharmacy programs. *Am J Pharm Educ* 1989;53:121-7.
2. Penney NE, Gibbons B, Busby A. Partners in distance learning: Project Outreach. *J Nurs Admin* 1996;26(7/8):27-36.

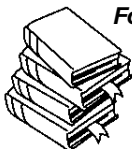
3. Learn CD. Distance learning: issues and applications for nontraditional programs. *Am J Pharm Educ* 1994;58:406-10.
4. Blumenstyr G. Some elite universities get serious about distance learning. *Chronicle Higher Educ* 1997;(Jun 20):A3-A4.
5. Anon. How the National Guard met its distance training needs. *Distance Train* 1998;DT9-10.
6. Moore K, Brouwer K, Joyner PU. Lessons gained from distance delivery of an applied pharmacokinetics course. *Am J Pharm Educ* 1997;61:310-13.
7. Kaplan IP, Patton LR, Hamilton RA. Adaptation of different computerized methods of distance learning to an external PharmD degree program. *Am J Pharm Educ* 1996;60:422-5.
8. MacKinnon GE, Zgarrick DP. Curricular considerations of a nontraditional doctor of pharmacy degree program: implications of a bi-state pharmacist survey. *Am J Pharm Educ* 1998;62:36-43.
9. Anon. A new option for Pharm.D.: college may pursue non-traditional approach to graduate degree program. *Dispenser—The University of Texas College of Pharmacy News* 1995;63:1-4.
10. Wanzie PM, Gregoire RE, Wiley SW. Assessment of the continuing professional education needs of Pennsylvania pharmacists. *ASHP Midyear Clinical Meeting* 1990:349E.
11. Walters MJ, Ferrante-Wallace J. Lessons from nonresponse in a consumer market survey. *J Health Care Marketing* 1985;5:17-28.
12. Madhavan SS, Rosenbluth S, Amonkar M, et al. Pharmacists' willingness to provide immunization services: a national survey. Invited presentation at the 33rd National Immunization Conference, Dallas, TX, June 20-25, 1999.
13. Madhavan SS. Pharmacy as links in the chain of immunization delivery and advocacy. Moderator and presenter in a session at the 91st Annual Convention of the West Virginia Pharmacist Association, September 11-13, 1998.
14. WVU Office of Rural Health. West Virginia Rural Health Education Partnerships annual report 1998.
15. Hanson AL, DeMuth JE. Facilitators and barriers to pharmacists' participation in lifelong learning. *Am J Pharm Educ* 1991;55:20-9.
16. Bernardi VW. A comparison of selected variables associated with participation in pharmacy continuing education programs [Dissertation]. Storrs-Mansfield, CT: University of Connecticut; 1974.
17. Morley A, Jepson MH. Pilot survey of attitudes to continuing education. *Pharm J* 1985;235:594.
18. Whiteman J, Scott EM, McElnay JC. Analysis of pharmacists' attitudes toward a distance learning initiative on health screening. *Am J Pharm Educ* 1994;58:300-6.
19. Keck JF. Comparison of learning outcomes between graduate students in telecourses and those in traditional classrooms. *J Nurs Educ* 1992;31:229-34.
20. McLeary I, Eagan M. Program design and evaluation: two-way interactive television. *Am J Distance Educ* 1989;3:50-60.
21. Dirr P. The critical questions in the evaluation of distance education. Paper presented at the Third Annual Conference on Teaching at a Distance, Madison, WI; 1987.

22. Doring A, Moon R. Evaluation of knowledge, attitudes and skills in distance teaching: a discussion paper. In: Evaluation in distance teaching. Armstrong J, Moon R, eds. ERIC Document Reproduction Service No. ED 223125, 1980.

23. Armstrong J. Concluding session: key issues in evaluating in distance teaching. In: Evaluation in distance teaching. Armstrong J, Moon R, eds. ERIC Document Reproduction Service No. ED 223125, 1980.

24. Buttaro M. AACP House of Delegates vote: colleges to move to sole entry-level PharmD. *Am J Hosp Pharm* 1992;49:2346-50.

25. Virtual Technology Bootcamp. Department of Pharmacy Care Systems at Auburn University's School of Pharmacy [resource on World Wide Web]. URL: <http://www.auburn.edu/academic/pharmacy/opao/boot.html>. Available from Internet.



For FACULTY/PROFESSIONALS with journal subscription recommendation authority for their institutional library . . .

If you have read a reprint or photocopy of this article, would you like to make sure that your library also subscribes to this journal? If you have the authority to recommend subscriptions to your library, we will send you a free complete (print edition) sample copy for review with your librarian.

1. Fill out the form below and make sure that you type or write out clearly both the name of the journal and your own name and address. Or send your request via e-mail to getinfo@haworthpressinc.com including in the subject line "Sample Copy Request" and the title of this journal.
2. Make sure to include your name and complete postal mailing address as well as your institutional/agency library name in the text of your e-mail.

[Please note: we cannot mail specific journal samples, such as the issue in which a specific article appears. Sample issues are provided with the hope that you might review a possible subscription/e-subscription with your institution's librarian. There is no charge for an institution/campus-wide electronic subscription concurrent with the archival print edition subscription.]

☐ **YES!** Please send me a complimentary sample of this journal:

(please write complete journal title here—do not leave blank)

I will show this journal to our institutional or agency library for a possible subscription.

Institution/Agency Library: _____

Name: _____

Institution: _____

Address: _____

City: _____ State: _____ Zip: _____

Return to: Sample Copy Department, The Haworth Press, Inc.,
10 Alice Street, Binghamton, NY 13904-1580