

Implications of Advanced Pharmacy Practice Experience Placements

Cecilia M. Plaza and JoLaine R. Draugalis

College of Pharmacy, University of Arizona, PO Box 210207, Tucson AZ 85721-0207

The purpose of this study was to assess relevant variables of advanced pharmacy practice experience placements in entry-level PharmD programs and to serve as a follow-up to surveys conducted in 1991-1992 and 1994-1995. Questionnaires were mailed to all accredited colleges of pharmacy to obtain information regarding entry-level PharmD programs. The number of colleges offering a PharmD degree has increased from 64 to 80 since the 1995 study. Eighty-nine percent (71/80) of the institutions contacted either provided data (42) or indicated it was too early in their curricular transition to do so (28). The number of practice experience students placed for the 1999-2000 academic year ranged from 12 to 203 per institution (mean = 80 + 40). When asked how difficult it would be to find sites within the next three years, 40 percent (17) of coordinators replied the difficulty would be five or greater on a seven-point scale (mean = 4.2 + 1.3). The three most difficult sites to obtain were ambulatory care, internal medicine, and institutional pharmacy. Eighty-five percent (34/40) of respondents cited an increase in inter-school competition for acquisition and retention of sites in the past three years. The area of inter-school competition merits further exploration as the number of institutions placing students in rotations continues to grow with the conversion to an all-PharmD system.

INTRODUCTION

Practice experiences, or experiential rotations, form the core of the advanced pharmacy practice experiences (APPEs) dictated by the American Council on Pharmaceutical Education (ACPE) in the latest Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree(1). The ACPE guidelines stipulate that, "...the core and selective experiences should be full-time and provide continuity of care, with pharmacy faculty supervision and monitoring" and include ambulatory and inpatient settings(1). The core experiences consist of community practice, hospital/institutional pharmacy practice and general medicine acute care with an emphasis on direct patient care. Selective experiences should be provided not only to complement the core experiences, but also to allow the student to pursue individual professional interests. These guidelines place the impetus on colleges and schools of pharmacy to cultivate and maintain sites for both the core and selective experiences.

The ACPE Guidelines outline what constitutes appropriate practice facilities that a college or school of pharmacy should have available in order to fulfill the APPEs. Schools should, "...have practice facilities of adequate number and sufficient nature to support the professional experience area of the curriculum and to provide for the student enrollment," as well as have administrative arrangements with these practice sites(1). The ACPE guidelines do not however prescribe guidelines for these administrative arrangements; arrangements which had not been described or explored in depth prior to a 1991-92 study(2).

In response to the increasing number of PharmD degrees awarded and the corresponding growing need for practice experience sites, the 1991-92 study by Draugalis and Slack looked at the financial implications of PharmD practice experience placements(2). This national survey described the types of contractual arrangements that colleges of pharmacy used in the acquisition and retention of practice experience sites. There was wide variability in the financial arrangements between schools and sites, with no clear standard practice emerging as the guiding principle behind these decisions.

Draugalis, Carter, and Slack conducted a 1994-95 follow-up study with a wider scope that examined trends and changes in both the financial and curricular arrangements involved in practice experience placements(3). While the number of formal financial agreements between sites and schools increased, the lack of a standard guideline for these arrangements remained unchanged since the initial 1991-92 study. The increases in enrollment and the number of PharmD programs, along with a corresponding need for more sites, were found to be leading towards more inter-school competition for practice experience sites, a potential trend that merited further exploration.

The enrollment in and the number of PharmD programs continues to grow. There was a 30.4 percent increase in the number of students enrolled in doctor of pharmacy degree programs between the Fall of 1997 with 15,984 and the Fall of 1998 with 20,842(4). While there was an overall 4.8 percent decrease in the total number of first professional degrees conferred between 1996-97 and 1997-98, the number of PharmD degrees being awarded promises to continue to rise as more schools convert to all PharmD programs. Currently 80 colleges and schools of pharmacy offer a PharmD as the first professional degree, up from 75 a year ago(5). Sixty-eight schools and colleges of pharmacy offer a doctor of pharmacy degree exclusively.

The increase in the number of PharmD enrollments is creating the need for schools to find more practice experience

Am. J. Pharm. Educ., 64, 404-409(2000); received 8/2/00, accepted 9/30/00.

Table I. Practice experience characteristics

	1999-2000
Number of students in rotations	(n = 42) ^a
Range	12 – 203
Mean ± SD	80 ± 40
Median	78
Number of rotations scheduled	(n = 41)
Range	96 – 2400
Mean ± SD	668 ± 387
Median	612
Number of required rotations	(n = 42)
Range	5 – 12
Mean ± SD	8.3 ± 1.6
Median	8
Length of rotations (in weeks) ^b	(n = 38)
Range	4 – 6
Mean ± SD	4.7 ± 0.9
Median	4

^a The number of respondents varied due to missing data for the different items.

^b Two institutions provided ranges for length of rotations and were not included.

placements with which to fulfill Standard No. 29, as well as the APPE portion, of the ACPE Accreditation Standards and Guidelines. The purpose of this study was to provide a continuing analysis of the trends and changes in primarily the curricular aspects of APPEs. In addition, this study further explored the area of inter-school competition for practice experience sites and its impact on site acquisition and retention.

METHODS

A 26-item questionnaire was mailed to the experiential coordinator at every U.S. college of pharmacy that offers at least one type of PharmD degree program. The schools were identified from the AACP 1999 Academic Pharmacy's Vital Statistics. Inclusion of all experiential coordinators at schools offering at least one type of PharmD program was essential to provide an accurate and complete description of the practice experience programs in the United States.

The instrument was a modified version of the questionnaire used in the 1994-1995 study. The new instrument included six new items concerning competition between schools for retaining and acquiring practice experience sites. The new instrument retained questions used to ascertain the current state of affairs in the curricular and financial arrangements for practice experiences while also providing the data for a longitudinal analysis of trends and changes. The questionnaire consisted of a mixture of forced choice, fill-in, and open-ended items. The instrument was assessed for the four sources of error common to survey research(6). Coverage and sampling error were controlled for by striving for a census rather than a sample and thus included the entire population (or nearly so) of experiential coordinators. The list of experiential coordinators was obtained using the most current PEP-SIG list supplied by AACP or a phone call to the institution. Measurement error was minimized through the use of pre-testing as well as by the use of a previously validated instrument. The instrument was assessed for content validity. Non-response error was addressed by using multiple mailings.

The instrument was pilot tested by one experiential coordinator, revised and then sent to the confirmed experiential coordinator at each college of pharmacy offering at least one type of PharmD degree program. The first mailing was sent out September 15, 1999, with follow-up mailings sent to all non-responders on October 25, 1999 and January 4, 2000. The third

Table II. Required practice experiences in entry-level PharmD degree programs

Rotations ^{a,b}	Percent of schools		
	1994-1995 (n = 41)	1999-2000 (n = 41)	Percent change
Ambulatory Care	93	95	+2
Community Practice	85	84.5	-0.5
Institutional Practice	76	81.5	+5.5
Internal Medicine	83	64	-19
Adult Acute Care	51	55	+4
Drug Information	54	35	-19
Pediatrics	32	22	-10
Geriatrics	17	22	+5
Psychiatry	24	17	-7
Oncology	2	7.5	+5.5
Long Term Care	7	7	0
Critical Care ^c		5	
Research	5	5	0
Infectious Disease	0	2.5	+2.5
Administrative	7	2.5	-4.5
Managed Care ^c		2.5	
Nutrition Support	2	2.5	+0.5
Pharmacokinetics	15	2.5	-12.5
Cardiology	2	2.5	+0.5
Home Health Care ^c		0	
Industry	2	0	-2
Surgery	2	0	-2

^a Ordered by frequency.

^b Two schools listed some rotations as both required and elective and were not included for those items.

^c Not stipulated in the 1994-1995 study.

mailing contained a modified, abbreviated version of one item in an attempt to increase the response rate by reducing the time required to complete the survey. Telephone calls and e-mails were used in the first quarter of 2000 to clarify non-responders curricular revision status.

Statistical analysis of the data was performed using Excel Version 9.0. Descriptive statistics such as means, standard deviations, medians, percentages and frequencies were used to summarize the data.

RESULTS

Subjects

Forty-two (53 percent) of the 80 colleges and schools of pharmacy offering an entry-level PharmD degree program were able to respond and provide data concerning APPEs for their institutions. Twenty-eight (35 percent) of the 80 institutions are in the midst of, or have undergone, curricular revision in the last several years and have yet to place students in entry-level configuration practice experiences and thus it was too early in the conversion to provide meaningful data. Therefore the overall response rate was eighty-nine percent (71/80) with 10 institutions as true non-responders.

Practice Experience Characteristics

The characteristics of the entry-level PharmD programs are shown in Table I. The results show a wide variation in the number of student and rotations scheduled for 1999-2000. Fifty-five percent of the institutions that responded utilized four week rotations, followed by 26 percent had six-week rotations, 16 percent had five-week rotations, and three percent had 4.3 week long rotations (n = 38).

Table III. Percentages of practice experience classifications 1999-2000 (n = 41)

Rotations ^{a,b,c}	Require	Elective	Not offered
Ambulatory Care	95	2.5	2.5
Community Practice	84.5	13	2.5
Institutional Practice	81.5	16	2.5
Internal Medicine	64	36	0
Adult Acute Care	55	37	8
Drug Information	35	62.5	2.5
Pediatrics	22	78	0
Geriatrics	22	73	5
Psychiatry	17	80	3
Oncology	7.5	92.5	0
Long Term Care	7	93	0
Critical Care	5	92.5	2.5
Research	5	90	5
Infectious Disease	2.5	95	2.5
Administrative	2.5	95	2.5
Managed Care	2.5	90	7.5
Nutrition Support	2.5	88	9.5
Pharmacokinetics	2.5	82.5	15
Cardiology	2.5	92.5	5
Home Health Care	0	100	0
Industry	0	95	5
Surgery	0	75	25

^a Ordered by frequency required in entry-level PharmD degree program.

^b Two schools listed some rotations as both required and elective and were not included for those items.

^c The number of respondents varied due to omitted items.

Table II provides a comparison of required rotations between the 1999-2000 academic year to the results from the 1994-95 study. Ambulatory care and community practice continue to be the most commonly required rotations. Critical care, managed care, and home health care were not stipulated in the 1994-1995 study and so comparisons were not possible for these rotation sites. No single rotation was required by all schools. The required rotations varied from institution to institution. Table III contains a summary of the percent of institutions that classify each rotation as either “required,” “elective” or “not offered” for the 1999-2000 academic year. Table IV provides a summary of the characteristics of the APPEs that the “typical U.S. pharmacy student” would probably be required to complete. Two schools listed certain rotations as both electives and required depending on what track the student opted in their respective program. Table V lists examples of some unique elective rotations that respondents reported offering students.

Site Acquisition and Retention

Ambulatory care and internal medicine sites were cited as the most difficult sites to obtain followed by institutional, community, and industry advanced pharmacy practice sites. The level of difficulty in acquiring and retaining sites was measured on a seven-point scale (scale anchored with 1 = not at all difficult and 7 = extremely difficult). When asked, if needed, how difficult it would be to find additional practice experiences sites within the next three years, 17 out of 41 schools (41 percent) responded with 5 or greater on the seven-point scale (mean = 4.2 ± 1.3). On a related question using a seven-point scale, schools were asked to rate the difficulty maintaining adequate practice experience sites/rotations within the next three years if the number of practice experience students remained the same. Fourteen out of 42 schools (33 percent) responded

Table IV - Characteristics of APPEs for the “Typical U.S. Pharmacy Student”

Required Rotations	<ul style="list-style-type: none"> • Ambulatory Care • Community Practice • Institutional Practice • Internal Medicine • Adult Acute Care
Number of rotations ^a	8
Number of weeks per rotation ^b	4

^aReported as the mode, n = 42.

^bReported as the mode, n = 38.

Table V. Examples of unique elective rotations

Association Management
Compounding
Disease State Management
FDA
HIV Clinic
Hospice
Investigational Drug
Nuclear Pharmacy
Operating Room
Pain Management
Pharmacy education
Poison Center
Rural Health
Transplant
Veterinary
Women’s Health

with 5 or greater on the seven-point scale (mean = 3.5 ± 1.6). Twenty-nine institutions reported losing at least one practice experience site during the 1999-2000 academic year. Three of these institutions responded with either a range or percentage of sites lost. Of the institutions that responded with a set figure, the number of sites lost ranged from 0-23 (mean = 7 ± 7, n = 29). Three institutions indicated that they lost no sites and 10 schools omitted the item. One institution reported losing 21 sites, further indicating that they did not provide monetary support.

When asked to state the reason for site withdrawals, the most often cited response was a lack of availability of pharmacists due to shortages or a lack of time. The other most common reasons for site withdrawal included in descending order, the preceptor moving, staffing changes, and the closure of the site.

One institution reported losing sites due to the preceptor position not being funded or if the preceptor left, the replacement not being funded. Two institutions lost sites due to structural changes within the site where a clinical pharmacy position, for example, was phased out. One school lost sites due to preceptor “burn out.” One institution lost a site due to the preceptor losing their pharmacy license and another because they requested payment. Institutions were not asked how many sites they gained.

Fifty-nine percent of institutions (23/39) had an increase in the number of out-of-state experiential placements in the past three years. Several schools cited the close proximity of neighboring states as contributing to the increase in use of out-of-state rotation placements.

Eighty-five percent of institutions that responded (34/40) reported an increase, 15 percent reported no change, and no schools reported a decrease in the past three years in inter-school competition for the acquisition and retention of practice experience sites.

Table VI. Summary of fee payment types (n = 42)

	Percent of institutions	Range of payments	Median
Pay student-based fees for all rotations	14	\$300 - \$600	\$425
Pay student-based fees for all rotations except for community and institutional	7	\$278 - \$750	\$600
Pay student-based fees for all rotations except for community	2	\$300	\$300
Pay student based fees for only certain kinds of rotations	36	\$75 - \$1250	\$550
Do not pay for any rotations	14	-	-
Unique payment scheme	10	-	-
Confidential	5	-	-
Unable to complete/omitted item	12	-	-

Financial Characteristics of APPEs

Table VI provides a summary of the types of fee payments paid to practice experience sites. Site-based fees were not analyzed due to missing data. Two institutions cited concerns over confidentiality and would not yield any financial data. One institution pays student-based fees ranging from a low of \$700 to a high of \$13,150 to individual part-time faculty per year based on faculty rank and workload. Of the institutions that pay student-based fees for only certain kinds of rotations, seven of these schools paid different amounts depending on the site. Several of the schools that only paid for certain rotations paid the sites that they listed as the most difficult sites to secure.

The total amount of monetary support expended by those who paid practice sites for the 1999-2000 academic year ranged from \$1,250-\$900,000 (median = \$76,750, n = 30). The two institutions that did not provide financial information due to confidentiality concerns could not be included in the analysis. Institutions varied from zero to 98 percent in the percent of scheduled rotation placements that required monetary support (mean = 22 ± 26, n = 34). Approximately 50 percent of institutions provided non-monetary support in the form of continuing education waivers, reference books, or computer resources, in descending order. About one-quarter of the institutions that responded to this item provided travel funds. One institution reported that they did not provide other types of support since they pay all sites a student-based fee.

DISCUSSION

Curricular Implications

Prior to conducting this survey, it was difficult to anticipate the role that on-going curricular and programmatic changes would have on data collection. While the previous two studies had greater than ninety percent response rates, it was difficult to obtain the same level of participation since 28 of the institutions were currently undergoing, or have recently undergone, curricular revision in transitioning to all-PharmD degree programs. Thus we plan to do a three-year follow-up rather than a five-year follow-up study in order to reassess when more institutions have reached steady state in the experiential components of their respective programs. We estimate that most of the institutions that were unable to respond to this survey will have placed their first all-PharmD students over the next three years and be able to provide the desired information.

Since the previous survey in 1995, no single required rotation for all schools has emerged. Several schools wrote in comments that they were unsure about different names and titles that they utilized for listings of practice experiences compared to the ones used in the survey. This difference in classification may account for schools requiring different rotations. In an

attempt to be up to date, we used the term “advanced pharmacy practice experience” to refer to clerkships in keeping with the new ACPE standards and guidelines, which based on comments from several respondents, caused confusion(1). On an ironic note, several schools continue to use the term “externship”, which the term “clerkships” was originally intended to replace. The difference in terminology may have been a contributing factor in some of the omitted items. There was also confusion with regards to differentiating between early and advanced practice experiences, specifically regarding at what point in the curriculum a rotation was designated advanced. In the area of practice experience curricula, there is a certain degree of overlap with nomenclature for rotations. However institutional practice is usually understood to concern inpatient hospital dispensing (either centralized or decentralized in nature). Internal medicine usually concerns itself with the care of general medicine type patients (e.g., diabetes, transplant patients). Adult acute care usually deals with acute medical patient care such as trauma. There is obviously overlap with several rotations but they are generally understood to be different rotations.

The difference in required rotations also appears to depend on local availability. Only three schools required an oncology practice experience, whereas 93 percent (37/40) offered this rotation solely as an elective. These institutions are located in close proximity to major cancer centers in the country. In this situation, it appears that specialty areas are a driving force in the curriculum since it would probably be difficult for other institutions to have oncology as a required rotation and to be able to place all their students.

While the percent of institutions requiring certain core rotations has remained fairly consistent since the 1994-95 study, there was a dramatic decline in the percentage of schools requiring internal medicine, drug information, pediatrics, and pharmacokinetics rotations. For example, six institutions do not offer a pharmacokinetics rotation (15 percent, n = 40). Several schools cited a lack of preceptors in internal medicine, drug information, pediatrics, and pharmacokinetics as the primary reason for moving these rotations from required to elective status in their experiential programs. If the availability of preceptors continues to drive curricular decisions, the increasing concerns over manpower issues and the nationwide pharmacist shortage promises to further impact experiential programs. Required rotations may be dictated more by preceptor availability in the face of the anticipated increased workload demands for a shrinking pool of pharmacists rather than by a predetermined set of curricular objectives. The lack of availability of pharmacists due to shortages or a lack of time was the most often cited reason for site withdrawals by respondents, a problem that only promises to continue.

Ambulatory care, internal medicine, community and institutional practices continue to be the most often required as well as the most difficult rotations to obtain. As more schools and colleges of pharmacy move towards placing their first all-PharmD classes in practice experiences, it will be interesting to see the type of strain it puts on this balance. It may warrant further observation to see if some of these rotations move towards being elective rather than required based on increased demand and the resulting balance between ACPE recommendations for APPEs and institutional reality. One institution reported internal medicine as the most difficult type of site to secure and noted that it had been dropped as a requirement. With 28 institutions still in the beginning stages of the transition to the all-PharmD degree program, it was difficult to ascertain the full curricular ramifications of APPEs. In the follow-up study it may be of interest to see if any institutions use rotation availability as a recruitment tool.

Financial Implications

While this study was originally designed to examine both curricular and financial implications of PharmD practice experience placements, several factors precluded gathering extensive financial data. Many of the institutions that responded to the survey did not complete all the financially related items. Two schools cited a concern over confidentiality of the financial data and did not provide any information concerning their programs.

The original instrument contained an item that asked for amount of money paid per type of site, the number of sites, and the number of students placed in that type of site (*e.g.*, the amount of money paid for an ambulatory care site, the number of ambulatory care sites, and the number of students placed in ambulatory care sites for the 1999-2000 academic year). The earlier respondents commented that this item proved to be rather cumbersome and time consuming to complete. Based on this feedback and a low response rate, this item was revised for the third mailing. It was shortened to only ask about amount of money paid per type of site and the number of students placed since most schools that had responded to the item provided that information. Even with the shortened version of that item, the third mailing was unsuccessful in providing the desired increase in response rate.

It appears that there has been a blurring of site-based and student-based fees over the years. Most payments seem to be student-based rather than site-based fees. There also appears to be a high degree of variability in the type of payments made to sites and this study was not able to account for all the unique arrangements that institutions are utilizing. While some schools responded that they did not pay for rotation sites and correspondingly reported that the total amount of monetary support for practice experience sites paid by their respective institution was zero, others reported a dollar amount. And while most respondents were able to answer whether or not they provided other types of support to practice experience sites, the majority were unable or unwilling to place a dollar amount on the costs incurred in doing so. An attempt was also made to gather information on the quantity and types of split-funded positions being used as an alternate form of funding a rotation site, however, missing data made this analysis impossible.

Except for institutions that did not pay sites at all or paid all sites the same amount, there was also wide variability in the amount paid to different categories of sites. Some institutions paid some sites, but not others, within the same category. It

would appear that not all payment schemes are created equally, thus heightening the need to use a more rational method to determine the actual costs incurred and benefits derived in having rotation sites.

A number of institutions reported using all full-time faculty or alumni preceptors to place students in their APPEs and thus no need for payment. As the number of students needing placement continues to grow as all-PharmD programs become more established, these institutions may find it difficult to meet the increased demand.

Inter-school Competition

With more institutions transitioning to the all-PharmD degree program and more school and colleges of pharmacy opening across the nation, the issue of inter-school competition was cited as a concern in the 1995 study. In the current study, 85 percent (34/40) of respondents cited an increase in inter-school competition in the past three years and as more of the schools begin to place students, this promises to rise.

The issue of confidentiality of the type of data this survey sought to obtain was linked by several schools to concerns over inter-school competition. There was a concern that any data provided, specifically financial in nature, might provide another program a competitive edge in the acquisition and retention of practice experience sites. This may be related to a problem noted in the 1991-1992 and the 1995-1995 studies concerning the lack of a standard guideline for the formulation of financial agreements. The lack of a formal financial agreement, in some cases, has led to sites asking for a certain amount of money based solely on what other schools were willing to pay rather than based on any costs in time or resources actually expended in precepting students. While this was not mentioned specifically by any institution in this study, it is an issue that merits further exploration if inter-school competition continues to increase. Carter *et al.*(7) developed algorithms for estimating the impact of practice experience placements on site productivity and provided the means to estimate a rationally based figure on the actual costs incurred in training students(7). It would be interesting to see if the use of such algorithms would alleviate this potential source of inter-school competition.

Limitations

A number of items in the survey instrument did not generate reportable results due to missing data. Still others lacked relevance upon discovery of the number of institutions that have yet to place their first group of entry-level PharmD students in their APPEs. It was also unclear if the 10 institutions that did not respond differed significantly from respondents.

CONCLUSIONS

The need to reassess curricular trends has grown in importance with now 80 schools and colleges of pharmacy offering an entry-level PharmD. It is imperative to evaluate programs in order to have a picture of how future pharmacists are being educated beyond the didactic portion of their curriculums due to the wide variability in the curricular approach to APPEs. The areas of inter-school competition and the financial arrangements for practice experience sites and their implications merit further review.

References

- (1) American Council on Pharmaceutical Education, *Accreditation Standards and Guidelines for the Profession Program in Pharmacy Leading to the Doctor of Pharmacy Degree*, June 14, 1997. The American Council on Pharmaceutical Education, Inc., Chicago IL.

- (2) Draugalis, J.R. and Slack M.K., "Financial implications of PharmD clerkship placements: A national survey," *Am. J. Pharm. Educ.*, **57**,18-24(1993).
 - (3) Draugalis, J.R., Carter, J.T. and Slack, M.K., "Curricular and financial implications of PharmD clerkship placements," *Am. J. Pharm. Educ.*, **60**, 146-151(1996);
 - (4) Meyer, S.M. and Marmorino, M.P., "The pharmacy student population: Applications received 1997-98, degrees conferred 1997-98, Fall 1998 enrollments," *ibid.*, **63**, 57S-67S(1999).
 - (5) American Association of Colleges of Pharmacy [resource on World Wide Web]. URL: <http://www.aacp.org>. Accessed 2000 Feb15.
 - (6) Salant, P. and Dillman, D.A., *How to Conduct Your Own Survey*, John Wiley and Sons, Inc., New York NY (1994).
 - (7) Carter, J.T., Draugalis, J.R., Slack, M.K. and Cox, E.R., "Algorithms for estimating learning opportunity and productivity impact at clerkship sites," *Am. J. Pharm. Educ.*, **62**, 258-265(1998).
-