Evaluating Preceptor Perceptions of Student Readiness for Clerkship

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ABSTRACT. The Philadelphia College of Pharmacy (PCP) recently transitioned to an entry-level doctor of pharmacy program. To help maintain a high-quality program, assessment of curricular outcomes is necessary. The Planning Committee of the PCP at the University of the Sciences in Philadelphia developed a survey that was distributed to clerkship preceptors in January 1999. It evaluated students' knowledge, skills, and level of professionalism following the didactic portion of the curriculum. Forty percent of the distributed surveys were returned. Overall comparisons showed that PCP students were comparable to students from other programs. Relative to knowledge base, skills, and professionalism, PCP students were above average or better. Full-time faculty ranked students significantly lower than non-full-time faculty. Other factors that may have affected the results observed include preceptor gender, age, type of practice site, when the students are precepted (early versus late in the clerkship component of the curriculum), and alumni status. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <getinfo@haworthpressinc.com> Website: <http://www.HaworthPress.com> © 2002 by The Haworth Press, Inc. All rights reserved.]
INTRODUCTION

Historically, the Philadelphia College of Pharmacy (PCP), like other colleges of pharmacy, offered two degree programs, including a bachelor’s degree in pharmacy and a postbaccalaureate doctor of pharmacy degree. With the recent transition to an entry-level doctor of pharmacy program, several curricular changes have been necessary. Such changes include, in general, increasing the fundamentals of human diseases and pharmacotherapeutics course sequence from a 15-credit course (including laboratory activities and case discussions) to a 20-credit didactic course with an additional 2 credits each of laboratory and patient case discussions. Further, this new curriculum has an increased emphasis on skills such as communication and physical assessment. The need, therefore, for continuous curricular evaluation to maintain provision of a high-quality program and to assess curricular outcomes is clear.

Evaluating the outcomes of the current instructional approaches used in the classroom on the therapeutic knowledge, attitudes, and skills of the students is necessary. The experiential education portion of the curriculum is where these curricular components are applied. It seems appropriate, then, that the feedback provided by clinical clerkship preceptors be used in the process of curricular assessment and evaluation. This feedback will provide both summative and formative outcome measures of the transitional curriculum. With the evaluation of therapeutic knowledge, summative outcomes relative to the current didactic course work may be collected. Evaluating the three areas of therapeutic knowledge, skills, and professional behavior together, formative outcome measures may be gathered, with the intent of influencing future curricular change.

Previous studies published in abstract form have suggested that preceptor evaluation of students allows for improved curricular monitoring and is a useful method in curricular revision, including revision of specific course work (1-3). In an effort to assess our entry-level doctor of pharmacy program curriculum and to introduce a longitudinal programmatic assessment process, we surveyed the preceptors’ perceptions of students’ readiness for clerkship in the areas of therapeutic knowledge, skills, and professionalism, particularly as they compare to students in similar degree programs from other institutions.
METHODS

Survey Development

A survey was developed by faculty at the Philadelphia College of Pharmacy (PCP), University of the Sciences in Philadelphia (Appendix A). An ad hoc group of the Planning Committee of the College of Pharmacy formulated the survey, and the remaining committee members reviewed the survey for face and content validity. Two hundred ten surveys were mailed out on January 5, 1999, as a single mailing, to all full- and part-time faculty preceptors of (B.S. and Pharm.D.) clerkship students. Surveys were to be returned by January 31, 1999, in the enclosed postage-paid envelope. Reminder postcards were not used.

The primary hypothesis was tested using a three-point scale evaluating the comparative perceived performance of PCP students versus other students the preceptor had encountered from other schools (1 = deficient, 2 = comparable, and 3 = superior). Other relationships to be analyzed included the overall comparison of students stratified by type of practice site, preceptor experience, preceptor alumni status, and full-time faculty status.

The domains of knowledge, skills, and professionalism were analyzed separately using a five-point Likert scale and summary data across type of site, preceptor alumni status, and full-time faculty status. In addition, individual therapeutic domains were identified and the results tabulated.

Statistical Analysis

Returned survey data were entered into a Microsoft® Excel spreadsheet and imported into Systat® 8.0 for analysis. All data were analyzed using Student’s t test and ANOVA unless skewed. In those cases, the non-parametric equivalents (Mann-Whitney U and Kruskal-Wallis ANOVA) were used. All alpha values were set at 0.05.

RESULTS

Ninety-seven surveys were returned (several faxed copies were returned; no e-mail responses were received) with 84 usable responses yielding a response rate of 40%. Reasons for the 13 nonusable surveys were: 4 preceptors only precepted B.S.-level students; 1 only precepted
Flexible-Option Pharm.D. students; and 8 precepted fewer than 3 students during the past 2 years. No effort was made to compare responders to nonresponders due to the anonymous nature of the survey.

The demographics of the responding preceptors and types of rotation sites offered at PCP are described in Table 1. Clinically based rotation sites included an inpatient hospital setting, a hospital-based outpatient clinic, or a physician’s office. The community pharmacy practice experience was obtained in a traditional independent or chain drugstore environment. Institution-based pharmacy rotations allowed students to familiarize themselves with the traditional dispensing functions of a hospital pharmacist. Both community-based pharmacies and institution-based pharmacy departments were used for management rotations. Activities included drug use evaluation, adverse drug reaction reporting, formulary review, cost-containment outcome assessment, quality assurance, inventory control, provision of dispensing services, reimbursement programs and procedures, and maintenance of pharmacy records. Typically, students were also involved in dispensing and/or clinical functions. Respondents who provided hospital and/or community pharmacy practice opportunities with exposure to management issues were listed as multiple sites.

The pharmaceutical industry provided students with opportunities in drug information, clinical research, quality assurance, regulatory affairs, and sales and marketing. Other rotation sites included teaching, clinical or laboratory-based research opportunities available at PCP, managed care, nursing home and long-term care consulting, home health care, hospice, medical communication companies, advertising agencies, poison control center, Food and Drug Administration, American Indian health services, and the American Society of Health-System Pharmacists.

Overall comparisons of PCP students to students from other pharmacy schools (Table 2) showed PCP students were at least comparable to other pharmacy students (2.18 ± 0.53, \( p = 0.581 \)). However, only 63/83 (76%) of preceptors responded to this question, while 20 respondents were unable to make a comparison, primarily because they precepted too few or no students from other schools of pharmacy. When divided by type of practice site, alumni status, and faculty status, there remained no appreciable difference except for alumni status. The alumni preceptors rated the PCP students an average of 2.4, higher than the 2.0 rated by nonalumni (\( p = 0.007 \)).

Preceptors were also asked to evaluate PCP students based on their therapeutic knowledge base, skills, and level of professionalism. Pre-
TABLE 1. Demographics of Respondent Preceptor Sites.

<table>
<thead>
<tr>
<th>Site Categories</th>
<th>Clinical</th>
<th>Community</th>
<th>Hospital</th>
<th>Industry</th>
<th>Othera</th>
<th>Multipleb</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Responding</td>
<td>25</td>
<td>11</td>
<td>18</td>
<td>4</td>
<td>15</td>
<td>10</td>
<td>83</td>
</tr>
<tr>
<td>Years of Preceptoring—Mean (SD)</td>
<td>1.5 (0.9)</td>
<td>2.1 (0.9)</td>
<td>1.8 (1.1)</td>
<td>1.5 (0.6)</td>
<td>1.4 (0.9)</td>
<td>1.9 (1.1)</td>
<td>1.7 (1.0)</td>
</tr>
<tr>
<td>Number of Students Precepted in Past 2 Years—Mean (SD)</td>
<td>11.6 (8.1)</td>
<td>10.0 (5.4)</td>
<td>15.8 (12.3)</td>
<td>7.5 (5.7)</td>
<td>6.1 (2.6)</td>
<td>16.5 (21.3)</td>
<td>11.7 (10.9)</td>
</tr>
<tr>
<td>Percent of Respondents USP/PCP Alumni</td>
<td>44</td>
<td>55</td>
<td>56</td>
<td>50</td>
<td>47</td>
<td>50</td>
<td>48</td>
</tr>
</tbody>
</table>

a The Other category represents PCP campus-based activities, managed care, long-term care, home health care, hospice, medical education, advertising, poison control center, the federal government, and national pharmacy organizations.

b Five sites indicated they supported management rotations, four of which also supported clinical rotations. The single management site only precepted one student in the past two years and was therefore excluded from data analysis. The remaining four management sites’ data is incorporated into the Multiple category.

TABLE 2. Results of Comparisons of Students to Comparable Degree Programs.

<table>
<thead>
<tr>
<th>Dimension Measured</th>
<th>Mean (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Comparison (n = 62)</td>
<td>2.18 (0.53)</td>
</tr>
<tr>
<td>Clinical</td>
<td>2.10 (0.64)</td>
</tr>
<tr>
<td>Community</td>
<td>2.29 (0.49)</td>
</tr>
<tr>
<td>Hospital</td>
<td>2.33 (0.49)</td>
</tr>
<tr>
<td>Industry</td>
<td>2.50 (0.71)</td>
</tr>
<tr>
<td>Other</td>
<td>2.10 (0.32)</td>
</tr>
<tr>
<td>Multiple</td>
<td>2.00 (0.53)</td>
</tr>
<tr>
<td>Alumni* (n = 26)</td>
<td>2.4 (0.6)</td>
</tr>
<tr>
<td>Full-Time Faculty (n = 9)</td>
<td>2.0 (0.5)</td>
</tr>
</tbody>
</table>

*Significantly greater than nonalumni [2.0 (0.4), p = 0.007]

ceptors ranked the students’ knowledge base in 13 specific therapeutic areas on a 5-point Likert scale, with 1 = poor and 5 = excellent. Students were assessed on their communication skills, ability to counsel patients, use of drug information resources, ability to apply pharmacokinetic principles, ability to identify drug-related problems, ability to use physical assessment skills, and ability to obtain an accurate and complete
medication history. Evaluation of student professionalism involved eight specific questions, including maintaining patient confidentiality, displaying empathy and concern for the patient, personal interactions with health care providers and preceptor, and work ethic. PCP students were above average or better in all three dimensions measured, as defined by a score of ≥ 4. Results for these three categories (mean ± SD) were 3.27 ± 0.64, 3.46 ± 0.66, and 3.93 ± 0.67, respectively (Table 3).

Table 3 further categorizes the results by type of site. An overall comparison showed no difference between sites (p = 0.581). However, some specific differences were observed when preceptors assessed the three specific dimensions (Table 4). Clinical sites tended to rate the students lower in the therapeutic and skill dimensions, while the pharmaceutical industry tended to rate them higher. A post-hoc analysis showed that the difference was statistically significant only between clinical sites and the other category for therapeutic knowledge, and clinical sites and industry for skills. There were no significant differences between the other pairwise comparisons. The large difference observed in the standard deviation in the pharmaceutical industry results may be secondary to the limited number (four) of these sites. There was no differ-

### TABLE 3. Results of Comparisons on Evaluated Dimensions of Therapeutic Knowledge, Skills, and Professionalism.

<table>
<thead>
<tr>
<th>Dimension Measured</th>
<th>n</th>
<th>Mean (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic Knowledge</td>
<td>78</td>
<td>3.27 (0.64)</td>
</tr>
<tr>
<td>Skills</td>
<td>82</td>
<td>3.46 (0.66)</td>
</tr>
<tr>
<td>Professionalism</td>
<td>83</td>
<td>3.93 (0.67)</td>
</tr>
</tbody>
</table>

### TABLE 4. Results of Evaluated Dimensions Categorized by Type of Site.

<table>
<thead>
<tr>
<th>Dimension Measured</th>
<th>n</th>
<th>Mean (± SD)</th>
<th>P-Valuea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Clinical</td>
<td>Community</td>
</tr>
<tr>
<td>Therapeutic Knowledge</td>
<td>78</td>
<td>2.94 (0.47)b</td>
<td>3.59 (0.67)</td>
</tr>
<tr>
<td>Skills</td>
<td>82</td>
<td>3.11 (0.64)b</td>
<td>3.60 (0.65)</td>
</tr>
<tr>
<td>Professionalism</td>
<td>83</td>
<td>3.75 (0.76)</td>
<td>4.23 (0.62)</td>
</tr>
</tbody>
</table>

a One-way analysis of variance
b Significantly different by Scheffe’s post-hoc analysis
ence found among preceptors relative to their perception of student’s professionalism. All found this dimension to be average or better.

While the PCP alumni preceptors ranked the students significantly higher in comparison to students of other, similar programs than the non-PCP alumni, no difference was found between alumni and nonalumni in the three specific dimensions measured (Table 5). PCP full-time and adjunct faculty practicing at a clinical site rated this dimension significantly lower than practitioners based in other practice settings (p < 0.005). The full-time faculty of PCP ranked the students significantly lower on the therapeutic knowledge, skills, and professionalism dimensions than non-full-time faculty (Table 6). However, there was no statistically significant difference in overall comparison (2.0 versus 2.2, p = 0.276).

**DISCUSSION**

One of the initial reasons for developing this survey instrument was to objectify verbally communicated isolated calls from preceptors regarding their perceived decreased quality of Pharm.D. students. However, this impression that the new curriculum did not produce students...
acceptable to preceptors was not substantiated because, overall, clerk-
ship preceptors perceived an average level, or above average level, of
student performance. One note is that, at the time the survey was admin-
istered, this was a self-selected group of students who chose to take the
Pharm.D. course of study. These students represented those graduating
from PCP anywhere from 1997 through 1999, 1 year after initiation of
the 6-year Pharm.D. curriculum. PCP students are required to complete
eight rotations of five-week duration: two ambulatory care, one general
medicine, one acute patient care, one pharmacy services management,
two selective pharmacy practice rotations, and one elective rotation.

Several factors may have affected the results of our survey. There
were fewer than expected community pharmacies responding, possibly
skewing the sample. Given that the majority of the original calls regarding
student performance came from the clinical and hospital preceptors,

It may be that these individuals/sites felt this was an opportunity to
voice their concern regarding student performance. However, the re-
sults suggest that these preceptors feel that the students actually per-
formed average or better than average in most areas.

The survey also does not take into account the timing of preceptor
contact with the students relative to when the students completed their
didactic work. It is possible that the perception of the preceptor might
change depending on whether the student was on the first clerkship ro-
tation or later in the clerkship process. It is expected that students al-
ready completing several rotations would have a greater therapeutic
knowledge base, possess more skills, and exhibit more professionalism.
The survey also does not take into account the types of rotations a stu-
dent may have had prior to the rotation that the preceptor was currently
evaluating. In the now phased-out two-year postbaccalaureate doctor of
pharmacy program, students completed an inpatient adult or pediatric
general medicine rotation within their first two out of eight rotations.

However, due to the increasing Pharm.D. class size at PCP and the lim-
ited number of available general medicine rotations for all students
early in their clerkship experience, standardized sequencing of the re-
quired rotations is not possible at this time.

Next, the survey asked preceptors to evaluate students’ knowledge in
13 specific therapeutic areas. Bias could have been introduced based on
the strengths and interests of the faculty developing the survey. For ex-
ample, diabetes mellitus, contraception, and menopause were surveyed
relative to endocrinology, whereas cardiovascular pharmacotherapy
was surveyed as a single entity. In addition, the amount of classroom
time dedicated to certain therapeutic topics may not reflect the students’
preparation for these topics on rotation. The emphasis of the particular rotation site may be far beyond the scope of the topic taught in the didactic sequence. Allocation of hours for a therapeutic topic in the pharmacotherapeutics course is decided on by a departmental committee and voted upon by College of Pharmacy faculty. It is based on the significance (impact on quality of life, health care costs, etc.) and frequency of the disease to be studied and the potential for therapeutic drug management.

Evaluation of how closely tied the therapeutic areas surveyed were to small group teaching, such as case studies and laboratory, is also of importance. It is possible that emphasis placed in the didactic portion of the curriculum is not adequately strengthened by case studies or activities provided by laboratory exercises. We are currently using an outcomes-based assessment approach in laboratory to test the readiness of our students for clerkship.

Alumni preceptors had a better overall impression of PCP students than non-PCP students, but for specific dimensions no differences were observed. One possible explanation may be that alumni preceptors possess a sense of loyalty to PCP. Preceptors may have rated PCP students higher in a subconscious desire to protect the value of their own diploma.

Differences in responses were also noted among clinical site respondents. Clinical full-time faculty graded students more stringently compared to adjunct faculty and nonclinical preceptors. Full-time faculty comprised 15.5% of the clinical site respondents. The survey did not collect much demographic information on adjunct faculty and nonclinical preceptors. These results are consistent with the published literature (4). Clinical full-time faculty are more familiar with the specific details of the curriculum and therefore may have higher expectations of the Pharm.D. student on rotation. It is also possible that clinical full-time faculty still expect the Pharm.D. student to function on the same level as a postbaccalaureate pharmacy student, whereas adjunct faculty and nonclinical preceptors may have adapted better to the current pharmacy practice environment.

Finally, differences among preceptors, such as gender, age, or type of pharmacy practice site, might have influenced the responses. Lower scores have been observed among female versus male preceptors, preceptors more than 50 years of age, and chain pharmacies compared to independent pharmacies (5).

This survey process is intended to be implemented on a two-year cycle as the six-year Pharm.D. program evolves. The purpose of the
continued survey process is to solicit input from the preceptors on a routine basis and to evaluate the impact of the curriculum. These results will be distributed to both the strategic planning committee and the college curriculum committee for consideration in both of these processes. It is anticipated that the results will influence how much emphasis is placed on the various aspects of knowledge, professionalism, and communication. For example, in the current strategic planning process, the College of Pharmacy has already identified that while professionalism received high ratings from preceptors, that this remains a key strategic area to maintain. As the class size of the six-year Pharm.D. program expands and the classes are no longer “self-selected” groups, the level of professionalism may change and adjustments to the curriculum and teaching methods maybe necessary.

CONCLUSION

Three other pharmacy schools within the geographic vicinity of the Philadelphia College of Pharmacy use many of the same practice sites. This survey of preceptors of entry-level doctor of pharmacy students has revealed that in an overall comparison, our students are comparable to students in the same degree programs from these other institutions.

Relative to the demonstrated level of readiness for clerkship, students in the entry-level doctor of pharmacy program at the Philadelphia College of Pharmacy were rated as average. An overall evaluation of readiness for clerkship relative to basic pharmacy skills including patient counseling, communication abilities, use of drug information resources, and proficiency in pharmacokinetics revealed that our students were slightly above average. In the specific area of professionalism, the preceptors rated our students above average relative to their clerkship preparedness. The results of this survey will provide a baseline for future evaluations of preceptor perceptions of student’s readiness as the newly implemented six-year Pharm.D. curriculum evolves.

RECEIVED: 10/06/00
REVIEWED: 12/11/00
REVISED: 08/07/01
REVIEWED AND ACCEPTED: 12/13/01
REFERENCES


APPENDIX A. Preceptor Survey

1. How long have you been a preceptor?_______________

2. How many students have you precepted for PCPS: a) over the past 2 years__________ b) > 2 years__________

3. Which of the following best describes your practice setting:
   - ☐ clinical setting (doctor’s office, hospital-based clinic, rounding in a hospital)
   - ☐ community pharmacy
   - ☐ hospital pharmacy
   - ☐ management setting
   - ☐ pharmaceutical industry
   - ☐ other____________________

4. What year did you graduate from pharmacy school?__________

5. Are you a Philadelphia College of Pharmacy and Science alumni?
   - Yes
   - No

6. Which of the following best describes the students that you precept (check all that apply)?
   - ☐ Bachelor of Pharmacy students
   - ☐ Entry-level Doctor of Pharmacy students
   - ☐ Flexible option Doctor of Pharmacy students

7. How do the students from PCP compare with students in comparable degree programs from other institutions?
   - ☐ Deficient in comparison
   - ☐ Comparable
   - ☐ Superior in comparison
   - ☐ Unable to judge
8. Entering your rotation, how would you assess the overall therapeutic knowledge base of PCP entry-level Doctor of Pharmacy students in the following areas?

<table>
<thead>
<tr>
<th>Area</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Excellent</th>
<th>No opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cardiovascular pharmacotherapy</td>
<td></td>
<td></td>
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<tr>
<td>b. Antimicrobial pharmacotherapy</td>
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<td></td>
<td></td>
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<tr>
<td>c. Cancer chemotherapy</td>
<td></td>
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<tr>
<td>d. Analgesia</td>
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<td>e. Antidepressants</td>
<td></td>
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<tr>
<td>f. Contraception</td>
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<tr>
<td>g. Menopause–hormone replacement therapy</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>h. Diabetes</td>
<td></td>
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<td></td>
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<tr>
<td>i. Pulmonary (asthma, COPD)</td>
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<td></td>
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<td>j. Gastrointestinal disorders</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. OTC products</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>l. Special needs groups–pediatrics, geriatrics</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
m. Reimbursement issues
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

9. How would you assess PCP entry-level Doctor of Pharmacy students regarding the following skills?

a. Patient counseling
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

b. Communications with other health care providers in providing appropriate information and asking appropriate questions to define patient related problems
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

c. Use of drug information resources
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

d. Applied pharmacokinetics
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

e. Identification of drug-related problems
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

f. Appropriate use of physical assessment skills (i.e., blood pressure, pulse, respiratory rate, etc.)
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

g. Attainment of an accurate, complete medication history
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

10. How would you assess the professionalism of PCP entry-level Doctor of Pharmacy students in the following noted matters/situations?

a. Maintaining patient confidentiality
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |

b. Interacting with other health care providers in a mature, appropriate manner
   | Poor | Below average | Average | Above average | Excellent | No opinion |
   | 1    | 2          | 3       | 4            | 5         |            |
c. Displaying empathy in interactions with patients
   1  2  3  4  5
   Poor  Below average  Average  Above average  Excellent  No opinion

d. Interacting with preceptor in a mature, appropriate manner
   1  2  3  4  5
   Poor  Below average  Average  Above average  Excellent  No opinion

e. Displaying a strong work ethic in the acceptance and completion of all assigned responsibilities
   1  2  3  4  5
   Poor  Below average  Average  Above average  Excellent  No opinion

f. Exhibiting appearance that is appropriate to the workplace
   1  2  3  4  5
   Poor  Below average  Average  Above average  Excellent  No opinion

g. Exhibiting behavior that is appropriate in the workplace
   1  2  3  4  5
   Poor  Below average  Average  Above average  Excellent  No opinion

h. Acting in a way that indicates a clear concern for the patient
   1  2  3  4  5
   Poor  Below average  Average  Above average  Excellent  No opinion

Comments: _______________________________________________________________

Signature (optional):________________________________