

Program assessment in a college of pharmacy[†]

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Abstract

Objective: The objective of this study was to describe a program assessment plan for one College of Pharmacy.

Methods: Assessment surveys were developed to include items that assessed students' and alumni's perceptions of the School's curriculum regarding opportunities to develop in the areas defined by the program's ten global curricular outcomes. The surveys were administered at various points in time—at the end of each year of the program, at graduation from the program and after graduation. The data collected represented three viewpoints: currently enrolled and graduating students, alumni, and employers. Employer data was collected by utilizing a focus group, comprised of key employers of college alumni. Data was analyzed using descriptive statistics.

Results: Means are reported on each of the ten global curricular outcomes for each group. The results of the employer focus group are presented.

Conclusion: Faculty and the College Curriculum Committee use the results of the assessment plan for program improvement.

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Keywords: Program assessment, program review, alumni evaluation, program improvement

Introduction

The last decade was a time of assessment. Politicians, students and families were asking for documentation of the value of their dollars spent on higher education. The health sciences were not immune to this movement. Colleges of Pharmacy responded to the need for public accountability with a top down approach. The American Association of Colleges of Pharmacy (AACP), the member association of pharmacy educators, wrote a series of papers that provided guidelines for defining curricular outcomes and a systematic approach to curricular evaluation (Commission to Implement Change in Pharmaceutical Education, 1993a, b). The American Council of Pharmaceutical Education (ACPE), the accreditation organization for pharmacy education, in turn revised their accreditation standards to include regular and systematic assessments (The American Council on Pharmaceutical Education, 1997). Individual colleges

of pharmacy then began to develop and implement their own assessment plans.

Assessment reports in higher education have traditionally taken one of three approaches:

- (a) Reputation studies that use expert opinion;
- (b) Objective studies that assess faculty productivity, financial resources or student outcomes;
- (c) Correlation studies examining the relationships between program quality and specific factors (Tan, 1986).

Often quality education has been associated with resources invested in buildings, faculty, libraries or programs. Quality education has also been associated with characteristics of incoming students or faculty productivity. Contemporary thinking on assessment calls for a focus on the quality of the end product of the educational experience, rather than a focus on inputs and resources. "Assessment asks the question regard-

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ing what students know and how they came to know it” (Muffo, 2001). In his early work on assessment, Terenzini suggests three questions—what is the purpose of assessment, what is the level of assessment, and what outcomes are to be assessed? (Terenzini, 1989).

Pharmacy education has recognized the need for assessment plans. Bouldin and Wilkin (2000), recently, reported that 44% of Colleges of Pharmacy have assessment plans and 49% have assessment committees. However, only 22% of the respondents report having personnel dedicated to assessment. The results of their survey suggest that while assessment is becoming more common in pharmacy education, the majority of colleges of pharmacy have yet to dedicate the resources needed to develop and implement assessment plans.

There have been several reports published in the field of pharmacy education summarizing assessment plans by individual colleges of pharmacy. Earlier assessment plans have mostly relied on alumni surveys (Quinies and Mason, 1994; Howard, Henry and Fincham, 1998). There are obvious advantages and disadvantages of relying solely on alumni surveys for curricular assessment. In fact, it has been noted that “only in retrospect, as practitioners who are daily faced with the demand of their chosen practice, are they able to identify the strengths and weaknesses of their professional preparation” (Rupp and Szkulklarek, 1991). On the other hand, bias is an obvious disadvantage. Typically, further when a subject is removed from a phenomena or event, the more likely he or she is to rate the event or phenomena favorably. In addition, alumni may be over-rating their professional abilities. Earlier reports in pharmacy education have focused on practice activities and career patterns of alumni. While there is an obvious link between alumni career activities and curriculum effectiveness, it has not been explicitly explored (Bond, Pitterle and Raehl, 1994; Koda-Kimble, Herfindal, Shimomura, Adler and Berstein, 1985, Herfindal et al., 1987; Carroll, Erwin and Beaman, 1984; Cox and Carroll, 1988; Fjortoft and Lee, 1995).

More recent studies describe assessment plans that focus on student data (Purkerson et al., 1996; Scott et al., 2002). These studies state curricular outcomes and outcome abilities and describe how these outcomes were measured. Scott et al. (2002) compared data collected from P-1 year to P-3 year, and reported growth or change in the stated outcomes. Students were asked to self-assess their ability for each of the items on an annual survey.

Nursing education has a history of curriculum assessment. For example, one recent study has examined curricular outcomes by surveying alumni employers (Sakalys et al., 2001). Identifying employers and seeking graduates’ permission to survey them regarding their abilities is time consuming and graduates may be protective of their privacy. However, employers

may be a source of objective data regarding how well the curriculum prepares students for professional practice.

There appears to be no reported program assessment plans in pharmacy education that measures and collects data from students, alumni and employers. Therefore, the objective of this paper is to describe one college’s program assessment plan and to report on the data collected.

Program assessment model

A model was developed to guide the assessment process (Figure 1). This model expands on the model developed previously by Beck (2000). The model begins with the stated mission of the College. Curricular outcomes were derived from the mission and, along with the curriculum and the learning environment, are the core of the assessment process. Curricular outcomes have two essential roles in the academic experience. They provide guidance to students in regards to what are the focus and expectations of the academic program, and they also provide faculty with standards and parameters for curricular development and evaluation. The curriculum is the mechanism through which the outcomes are delivered. The learning environment focuses on the “how” of teaching. It includes classroom teaching strategies, experiential teaching strategies, laboratory experiences, qualities of the faculty, physical facilities and qualities of the students (Mentkowski, 1994). Assessment of curricular outcomes leads to program evaluation, which in turn feeds back to the mission statement and the curricular outcomes. Simply put, curriculum assessment and evaluation leads to on-going curriculum improvement.

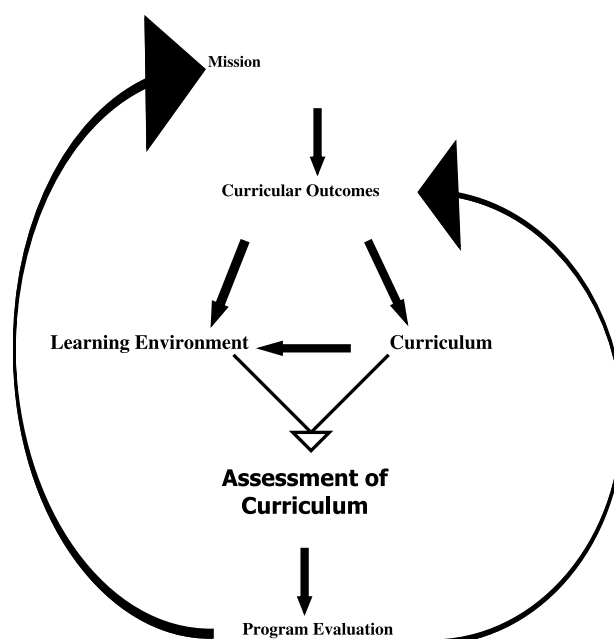


Figure 1. Curricular assessment flow chart, adapted from Beck (2000).

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Description of the program assessment plan

In developing the program assessment plan, the College was committed to seeking input at several points in time in the curriculum and from varying perspectives, including students, alumni and employers. As Mentkowski (1994) notes, “Feedback (to faculty) works best when it comes from more than one data source, from multiple measures and standards.”

The College of Pharmacy first identified ten global curricular outcomes, using the criteria established by AACP. The curricular outcomes were purposively broad and encompassing. According to Hollenback (1999), a global curricular outcome should:

- (1) characterize the performance as multidimensional (i.e. requires integration of knowledge, attitudes and skills);
- (2) describe something the student can use in personal and/or professional situations;
- (3) correspond to the pharmacy college or school mission;
- (4) be stated so that it is applicable to varied contexts;
- (5) embody multiple levels of development as the student progresses across the curriculum.

The curricular outcomes were developed originally from AACP outcomes, then revised and reviewed by faculty at committee meetings and retreats, and were finally reviewed by students. The outcomes were approved and adopted by College faculty in 1999. The faculty then used these outcomes as the basis for their assessment plan.

The program assessment plan is comprised of multiple elements. The first three elements are indirect measures of student learning as they are based on the perceptions of students, alumni and employers in regards to student learning on specific curricular outcomes. The first element is a student survey administered at the end of the first and second year and again at graduation (baccalaureate and Pharm.D.). The students are simply asked, “The first (or second, or entire) year curriculum as a whole provided me with opportunities to develop...” This statement was followed with the ten curricular outcomes and Likert scales (1–4, 5 not applicable). The second element of the assessment plan was an alumni survey. The alumni were surveyed one year after graduation and were asked, “How well did the curriculum prepare them to perform each of the pharmacy practice functions?” This statement was followed with the ten curricular outcomes and respondents were asked to respond with either poor, fair, adequate, good or excellent (rating 1–5).

The third element of the assessment plan was an employer focus group. Focus groups are useful in providing a deeper understanding of a program’s

outcome. Focus groups are informal, small group discussions that are designed to provide qualitative data. A target audience is identified, and participants are carefully selected and invited to participate. A moderator manages the discussion and is trained to focus the conversation on specific issues and elicit details from the participants (Dean, 1994). Again, the ten curricular outcomes were the foundation for the discussion. The focus group added qualitative data to the assessment of curricular outcomes.

The final two elements of the plan are the direct measures of student learning and the passing rates of graduates on the NAPLEX and advanced rotation assessments. Students on advanced rotations are assessed by preceptors through direct observation, case presentations, journal club exercises and other assignments that are specific to the type of rotation. Students are assessed on cognitive, psychomotor and attitudinal objectives.

Material and methods

For element one, an existing survey was modified to include the curricular assessment component. This survey was mailed to all first and second year students during the summer term. A follow-up reminder postcard was mailed to these students three weeks after the initial mailing. The graduating PS-3 and PS-4 students were surveyed in person during a required meeting at the conclusion of their rotations about a week prior to graduation.

The alumni survey was the second element of the assessment plan. A survey was developed and included three sections: general items regarding graduation year and characteristics of current job; achievements since graduation; and the assessment of how well the curriculum prepared them for pharmacy practice using the ten global curricular outcomes. The survey was mailed to all graduates who had been alumni for at least nine months, with a follow-up mailing four weeks later.

To prepare for the third element, the employer focus group, faculty and college leadership were asked which companies employed a critical mass of College graduates. From that list, a group of employers who represented pharmacy practice (hospital, corporate chain community, grocery store, discount store and independent community) were selected and invited. A list of discussion questions was prepared to include the ten global curricular outcomes, and was sent to the participants with the invitation. If participants were not able to directly observe college graduates or did not directly supervise them in their work, they were asked to seek input from others in the company who could observe college graduates’ work or directly supervise them. The two moderators were carefully selected from the faculty and trained. These two individuals did not personally know any of the

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participants. Introductory remarks were prepared that included a description of the focus group, explanation of the purpose of the focus group and guaranteed anonymity of the comments. Moderators were coached to not show bias during the discussion. The discussion was transcribed, and a succinct report was written summarizing the conversation.

The direct observations of student learning were NAPLEX scores and advanced rotation assessments. The College receives the NAPLEX scores for graduating students routinely from the National Association of Boards of Pharmacy (NABP). These data are reviewed by College leadership and compared to previous years. The assessments for the advanced rotations are embedded in the academic grading process.

Results

Data were collected from the currently enrolled students, alumni and employers. For the purposes of this project, the data reported are cross sectional and were collected from students and alumni in 2003. The employer focus group was conducted in October 2000. Tables I–V present the mean score for each of the curricular outcomes for the respective cohorts.

Table I describes the PS-1 (first year pharmacy student) data. Eighty-one usable surveys were returned for a response rate was 40%. Table II describes the PS-2 (second year pharmacy student) data. Thirty-nine usable surveys were returned for a response rate of 27%. Table III describes the graduating baccalaureate student data. Seventy-eight usable surveys were returned for a response rate of 95%. Table IV describes the graduating Pharm.D. student data. One hundred and one usable surveys were returned for a response rate of 96%. Two hundred and ten usable alumni surveys were returned for a response rate of 24%. Alumni data were presented in Table V.

The results from the employer focus group were described in a detailed report. For the purpose of illustration, information from that report is summarized in consensus remarks in Table VI. A total of six companies participated out of the ten that were invited (one representative from each company). They represented community corporate practice, community independent practice and discount retail. No hospital practice was represented.

The results of the direct observations of student learning are not reported due to student confidentiality.

Discussion

The College is in the process of identifying specific outcome statements for each of the global outcome statements. Once these are identified they will be

Table I. PS-1 Students' perceptions of how well the curriculum provided opportunities to develop stated curricular outcomes.

Curricular outcome	Mean ^{*,†}
Provide pharmaceutical care	3.20
Practice evidence-based clinical decision-making	3.23
Participate effectively in interdisciplinary health care teams	2.98
Communicate effectively	2.91
Develop and manage a pharmacy practice	2.72
Incorporate research into the practice of pharmacy	2.96
Demonstrate reflective, critical thinking, and problem solving skills	3.37
Act in an ethically, socially, culturally, and professionally responsible manner and promote such actions in others	3.40
Promote public health and disease prevention	3.18
Demonstrate a commitment to lifelong, self-directed learning	3.22

* Range 1 = strongly disagree, 4 = strongly agree, 5 = not applicable and omitted from calculation of mean. † $n = 81$, response rate 40%.

added to each of the instruments described in this paper. This will add more richness to the program assessment plan and provide more specific data back to the faculty for program improvement. Currently these data are shared with the College leadership and curriculum committee. Generally, it has helped faculty identify potential areas that are not as strong as others.

Limitations

This plan and data begs the question, what is being measured? Individual competencies in defined areas

Table II. PS-2 Students' perceptions of how well the curriculum provided opportunities to develop stated curricular outcomes.

Curricular outcome	Mean ^{*,†}
Provide pharmaceutical care	3.00
Practice evidence-based clinical decision-making	3.07
Participate effectively in interdisciplinary health care teams	2.88
Communicate effectively	2.89
Develop and manage a pharmacy practice	2.79
Incorporate research into the practice of pharmacy	2.79
Demonstrate reflective, critical thinking, and problem solving skills	3.23
Act in an ethically, socially, culturally, and professionally responsible manner and promote such actions in others	3.23
Promote public health and disease prevention	3.00
Demonstrate a commitment to lifelong, self-directed learning	3.15

* Range 1 = strongly disagree, 4 = strongly agree, 5 = not applicable and omitted from calculation of mean. † $n = 39$, response rate 27%.

Table III. Graduating Baccalaureate Students' perceptions of how well the curriculum provided opportunities to develop stated curricular outcomes.

Curricular outcome	Mean ^{*,†}
Provide pharmaceutical care	3.02
Practice evidence-based clinical decision-making	3.12
Participate effectively in interdisciplinary health care teams	3.06
Communicate effectively	3.02
Develop and manage a pharmacy practice	3.00
Incorporate research into the practice of pharmacy	3.15
Demonstrate reflective, critical thinking, and problem solving skills	3.18
Act in an ethically, socially, culturally, and professionally responsible manner and promote such actions in others	3.18
Promote public health and disease prevention	3.05
Demonstrate a commitment to lifelong, self-directed learning	3.07

* Range 1 = strongly disagree, 4 = strongly agree, 5 = not applicable and omitted from calculation of mean. †*n* = 78, response rate 95%.

are not measured. Rather, the College examined students' and alumni perceptions of how the curriculum prepared them in achieving the ten global curricular outcomes. Balance was sought between feasibility of data collection and usefulness of data in developing this plan. Only a small number of colleges of pharmacy utilize published, professional instruments (other than the NAPLEX) as part of their assessment plan (Bouldin and Wilkin, 2000), and the utility of these instruments in assessing professional practice competency or satisfaction with the curriculum is not known.

Table IV. Graduating PharmD students' perceptions of how well the curriculum provided opportunities to develop stated curricular outcomes.

Curricular outcome	Mean ^{*,†}
Provide pharmaceutical care	2.89
Practice evidence-based clinical decision-making	3.09
Participate effectively in interdisciplinary health care teams	2.96
Communicate effectively	3.03
Develop and manage a pharmacy practice	2.82
Incorporate research into the practice of pharmacy	3.25
Demonstrate reflective, critical thinking, and problem solving skills	2.97
Act in an ethically, socially, culturally, and professionally responsible manner and promote such actions in others	3.04
Promote public health and disease prevention	2.96
Demonstrate a commitment to lifelong, self-directed learning	3.04

* Range 1 = strongly disagree, 4 = strongly agree, 5 = not applicable and omitted from calculation of mean. †*n* = 101, response rate 96%.

Table V. Alumni assessment of how well the curriculum prepared them for pharmacy practice functions.

Curricular outcome	Mean ^{*,†}
Provide pharmaceutical care	4.04
Practice evidence-based clinical decision-making	4.05
Participate effectively in interdisciplinary health care teams	4.04
Communicate effectively	4.29
Develop and manage a pharmacy practice	3.60
Incorporate research into the practice of pharmacy	3.34
Demonstrate reflective, critical thinking, and problem solving skills	4.16
Act in an ethically, socially, culturally, and professionally responsible manner and promote such actions in others	4.44
Promote public health and disease prevention	4.00
Demonstrate a commitment to lifelong, self-directed learning	4.28

* Range 1 = poor, 5 = excellent. †*n* = 210, response rate 24%.

Another limitation of this study is the use of different scales for data collection. The alumni survey used an adjectival scale rather than a Likert scale. The low response rate for the PS-2 students and the alumni should also be noted.

Focus groups provide valuable detailed information and perceptions about program outcomes. However, that information cannot be generalized, and the nature of the focus group itself has limitations. Moderators were selected from the faculty due to financial constraints. Faculty are inherently biased regarding program outcomes. They were carefully coached to maintain emotional distance and not to react to participant comments. However, as the session was not videotaped, whether or not subtle messages were sent to the participants from the moderators is not known. The data is also subject to bias due to social desirability. It should also be noted that the focus group did not include representation from hospital practice.

Learning environment was not assessed other than broad questions about accessibility and faculty and college offices (not reported in this paper). No information on the effectiveness of teaching methods and its impact on curricular outcomes was collected. While this is an important part of the assessment model, data has not yet been collected to assess the effectiveness or the relationship between learning environment and student achievement of stated outcomes.

The long-term goal of the College is to follow cohorts of students longitudinally and assess changes in their perceptions on how the curriculum prepared them in the ten curricular outcomes. The purpose of this paper was to present and describe a curriculum assessment program.

Table VI. Employer focus group assessment of how well the curriculum prepared graduates for pharmacy practice.

Curricular outcome	Comments
Provide pharmaceutical care	Well prepared, excellent communication skills
Provide evidence-based clinical decision making	Graduates are able to problem solve. Graduates need the ability to think on their feet and use what they learn
Participate effectively in interdisciplinary health care teams	Prepared, excellent communication skills. Demonstrate initiative in communicating with physicians
Communicate effectively	Excellent communication skills. One of the strengths of the program
Develop and manage a pharmacy	Graduates are familiar with concepts, but application takes on-the-job training
Incorporate research into the practice of pharmacy	Few pharmacists are involved in research or educational projects
Demonstrate reflective, critical thinking, and problem solving skills	Graduates were on par with graduates from other programs. There is a need to learn how to multi-task
Act in an ethically, socially, culturally, and professional responsible manner and promote such actions in others	Graduates are adept at working with diverse individuals. Graduates understand the importance of professionalism and demonstrate great team spirit
Promote public health and disease prevention	Graduates are focused on community-service. They challenge employers to provide opportunities and release time to participate in these programs
Demonstrate a commitment to lifelong, self-directed learning	Graduates range from super achievers to those who do the minimum as required by law

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Conclusion

The data described and presented in this report provide the individual's perspective and the employer's perspective of how well the program prepared graduates for pharmacy practice, using the College's ten global curricular outcomes. The data provides feedback to faculty on the perceptions of students, alumni, and employers on the strengths and weaknesses of the program. The data suggests that the College is providing an educational experience that promotes student learning in stated outcomes. While this report describes only indirect measures of student learning, the NAPLEX scores and the advanced rotation assessments support this statement. An examination of Tables I–IV indicate that, as expected, mean scores did not increase for all items between PS-1 year and alumni status. What this implies is not clear, however, one must keep in mind that this data represents 4 different cohorts, and not growth or change of one cohort over time.

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