

Comparison of Faculty's Perceived Coverage of Outcomes: Pre- versus Post-Implementation

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The College of Pharmacy at South Dakota State University used a survey to determine the anticipated coverage of outcome statements in their PharmD curriculum prior to implementation of the curriculum. To determine if using a pre-implementation survey was valid, the faculty was resurveyed to ascertain their perceived level of coverage of the same outcomes after two years of curriculum implementation. This paper summarizes the difference between projected extent of outcome coverage prior to implementation and perceived extent of outcome coverage following implementation. The College's 85 outcomes were grouped into 13 categories. Three categories had a shift in level coverage by more than 10 percent of the courses. Overall, the faculty tended to slightly overestimate coverage of outcomes prior to implementation. There were only a few individual outcomes for which the coverage was considered to be inadequate. Action steps to compensate for these outcomes are discussed. Since there were few modifications required following the second survey, for our purposes the pre-implementation survey was a reliable means of predicting coverage of outcome statements.

INTRODUCTION

Outcomes have become the focus and measure of success for curricular design and development. Many schools are faced with the task of designing an entry-level PharmD program to meet the challenges facing the profession and subsequently must confront the arduous task of developing and agreeing upon a set of outcome statements. The American Association of Colleges of Pharmacy's outcome statements have provided a strong foundation for outcome development¹. After outcome statements are established, a major concern is whether each outcome is adequately addressed through educational experiences so that these curricular outcomes can be achieved by students.

South Dakota State University is a land-grant institution that has had a professional pharmacy program for more than 100 years. After extensive review and debate, an entry-level PharmD program was proposed. As described elsewhere(1), the curricular development plan was designed, outcomes developed and courses generated. The Curriculum Committee, composed of faculty from each department as well as students, developed the outcome statements which were refined and approved by the faculty. AACP documents served as the foundation for these activities and thus the Curriculum Committee's intent regarding outcomes were largely in concert with outcomes described by the AACP Commission to Implement Change in Pharmaceutical Education(2-5). The curriculum that was developed entails two years of preprofessional requirements and four years of professional training. Implementation of the curriculum began in 1994.

As a means to quantitate the projected achievement of curricular outcomes prior to implementation of the curriculum, the instructors for each course were surveyed regarding their projected achievement of each outcome. The instructors rated the anticipated extent of coverage on a Likert

scale (see Appendix, Outcome Survey Likert Scale). The results of this survey were used to evaluate whether the extent of coverage of each outcome was appropriate prior to implementation of the curriculum. A concern with this pre-implementation assessment is that the anticipated extent of coverage compared to the perceived extent after teaching the courses might differ. For example, experiential activities may be sacrificed for lecture content when the instructor realizes that the class is falling behind the intended schedule. In an attempt to determine the usefulness of this method of pre-implementation assessment, a subsequent survey was used in the spring of 1996, after two years of curricular implementation, in order to address the following objectives: (i) determine the reliability of projecting the extent to which outcomes will be covered prior to curriculum implementation; and (ii) evaluate the extent and appropriateness to which each outcome is addressed. This paper summarizes the results of the two surveys relative to these objectives.

METHODS

The survey was undertaken in the spring of the second year following initiation of the curriculum. All of the instructors responsible for teaching each of the 17 courses in the first two years of the professional program completed the survey. These were the same instructors who had completed the pre-implementation survey. The survey contained a list of the 85 outcome statements the college had agreed upon and a five point Likert scale to indicate the extent of coverage (Appendix, Outcome Survey Likert Scale). The survey was distributed after the curriculum had been implemented for two years so that each course in the first two years of the curriculum had been taught at least once. The results of the survey after implementation (1996) were compared to those prior to implementation of the curriculum (1994) for the same 17 courses.

RESULTS

To simplify interpretation and to be consistent with the original work, the five point Likert scale was collapsed to

¹Center for the Advancement of Pharmaceutical Education, *Educational Outcomes*, American Association of Colleges of Pharmacy, Alexandria VA (1994).

Table I. Average percentage of courses^a addressing each category of outcomes: pre- versus post-implementation

Category of outcomes	n ^b	Average					
		No experience		Cursory experience		Comprehensive experience	
		1994	1996	1994	1996	1994	1996
Values and ethics	4	44.1	60.3	45.6	27.9	10.3	11.8
Scientific method	4	23.5	38.2	48.5	33.8	27.9	27.9
Communication	5	12.9	18.8	40.0	45.9	47.1	35.3
Self learning	5	10.6	12.9	50.6	55.3	38.8	31.8
General science	9	35.9	38.6	39.9	43.8	24.2	17.6
Professional development	4	55.9	51.5	32.4	36.8	11.8	11.8
Leadership	3	56.9	52.9	35.3	35.3	7.8	11.8
Critical thinking	8	14.0	13.2	43.4	47.1	42.6	39.7
Professional science	20	48.2	44.7	32.1	34.4	19.7	20.9
Social Science, Humanities, Fine Arts	2	52.9	52.9	41.2	44.1	5.9	2.9
Patient care	9	64.7	67.3	26.8	26.1	8.5	6.6
Professional information utilization	7	41.2	41.2	40.4	42.0	18.5	16.8
Management	5	67.1	68.2	20.0	18.8	12.9	12.9

^aTotal number of courses = 17.

^bNumber of outcome statements in the category of outcomes.

three sets. The first set (“no experience”) contains those courses which do not address the outcome at all. The second set (“cursory experience”) contains courses which deal with the outcome “not extensively” or “somewhat extensively.” The final set (“comprehensive experience”) contains courses which address the outcome “extensively” or “very extensively.” The Outcome Survey Likert Scale (Appendix) contains a description of these terms which was provided with the survey.

CATEGORIES

The 85 outcomes were grouped into the same 13 categories as in the original work(1). Table I lists the average percentage of the 17 courses addressing each category of outcomes by level of experience in the entry-level PharmD curriculum as reported by faculty in pre-implementation (1994) and post-implementation (1996) surveys. Table II shows the percentage change in the average number of courses which address each outcome category when comparing the projected (1994) and the perceived (1996). This data was arrived at by determining the change in the average number of courses (1996-1994) at each level for each category and dividing by the total number of courses. The largest shift within any category was 17.6 percent. The three categories with the largest shift were Scientific method, Communication, and Values and Ethics which each had greater than 10 percent of the courses with a change in the level of outcome coverage as reported by the instructors following implementation compared to the instructors’ anticipated coverage.

INDIVIDUAL OUTCOMES

Examination of individual outcomes entailed comparing the mean level of perceived outcome coverage following implementation to the mean level of anticipated outcome coverage prior to implementation for each outcome. A complete list of the outcomes may be found elsewhere(1). The mean level of experience decreased in 61.2 percent [52]

of the outcomes, although only eight outcomes had a decrease in the mean level of experience by greater than 15 percent and only five outcomes increased by greater than 15 percent.

In order to evaluate appropriateness of the perceived level of outcome coverage, outcomes with very high or low mean level of coverage were examined. Outcomes with a mean level of coverage >3.0 were in the categories of critical thinking, communication, self learning and scientific method. These outcomes involved 15 percent [13] of the 85 outcomes. Although 40 percent [34] of the outcomes had a mean <2.0, action steps to achieve acceptable coverage were only required for management skills (five outcomes), drug distribution and dosage forms (four outcomes), and patient care (two outcomes).

DISCUSSION

The analysis by categories of outcomes provided a useful mechanism to assess trends in perceived outcome coverage after implementation compared to the projected coverage before implementation. The Scientific Method category was one of the three categories which were found to change most. The outcome statements with the largest shift in coverage within this category were lab experiences while math concepts were relatively unchanged. The coverage of Communication category also shifted considerably but this change was primarily due to one outcome which focused on the student’s ability to adapt methods to the target audience while demonstrating empathy. The third category with the largest shift was Values and Ethics for which the change in coverage was also primarily due to a single outcome. This outcome was regarding identification and clarification of personal values for oneself. These results suggest that the alterations were limited to a change in a single outcome and did not represent a dramatic change for the category.

The remainder of the categories had less than a 10 percent shift in the number of courses covering the outcome to a specific level. Although somewhat arbitrary, the 10

Table II. Percentage change in the average number of courses^a addressing each outcome category (1996 vs 1994).

Category of outcome	n ^b	No experience	Cursory experience	Comprehensive experience
Values and ethics	4	16.2	-17.6	1.5
Scientific method	4	14.7	-14.7	0
Communication	5	5.9	5.9	-11.8
Self learning	5	2.4	4.7	-7.1
General science	9	2.6	3.9	-6.5
Professional development	4	-4.4	4.4	0
Leadership	3	-3.9	0	3.9
Critical thinking	8	-0.8	3.7	-2.9
Professional science	20	-3.5	2.4	1.2
Humanities, arts and social science	2	0	2.9	-2.9
Patient care	9	2.6	-0.7	-1.9
Professional info use	7	0	1.6	-1.6
Management skills	5	1.2	-1.2	0
Average change		2.5	-0.4	-2.2

^aNumber of Courses = 17

^bNumber of outcome strategies in the category

percent shift level was perceived as a reasonable level to necessitate faculty scrutiny. A change in coverage was determined to be significant if the faculty decided compensatory action steps were necessary. Since few action steps were required, the pre-implementation survey was considered to be reliable for predicting level of coverage.

The average shift within each level of experience (Table II) showed that faculty tended to slightly overestimate the extent to which the outcomes would be met in "comprehensive" experiences. For most categories (six of seven) for which there was a decrease in "comprehensive" experiences, the decrease was in part accounted for by the increase in "cursory" experiences. A very small percentage (2.2 percent) of the 17 courses changed from "comprehensive" to "no experience."

Coverage of individual outcomes was evaluated based on the percentage of change from the initial projection. Several outcomes with reduced yet adequate coverage were identified. For example, the outcome addressing comprehension and meaningful interpretation of information declined from a mean of 4.41 to 4.06 but was considered to be covered sufficiently. Those outcomes with greater than a 15 percent reduction in coverage were viewed by the faculty as worthy of discussion. At a faculty curricular workshop action steps were established for the outcomes deemed deficient in coverage. For example, the outcome related to medical terminology had the largest percentage decline (28 percent). Even though it is a major portion of one course, the use of medical terminology throughout the first two years of the curriculum was less than desired. Consequently, the use of medical terminology was enhanced in the first two years of the curriculum.

Individual outcomes with extensive coverage (>3.0) were in areas expected to be employed extensively throughout the curriculum and required no action. Several of the thirty-four outcomes with mean level of coverage <2.0

brought about specific action steps. Coverage of management skills was increased from four to six credits, faculty teaching courses related to drug distribution and dosage forms coordinated their course contents to ensure adequate coverage of those outcomes, and case studies were developed by all faculty members to enhance simulated patient care throughout the classroom experience. It was the opinion of the faculty that the remainder of the outcomes with a mean level of <2.0 did not require specific action because, even though the mean score was low, the number of courses addressing those outcomes was sufficient for students to achieve those outcomes. For example, the outcome which required each student to identify and clarify personal values had a mean score of 1.76 but there were eight courses that covered it to the extent of "cursory experience" or "comprehensive experience."

There are limitations to the use of this process in curricular implementation. First, adequacy of outcome coverage is a subjective decision. Second, determination of the meaningfulness of the change from projected achievement to perceived achievement following implementation is also subjective. The faculty must evaluate whether the change is meaningful. Despite the subjectivity, only a very few outcomes required action steps and only one required a change in the curriculum. Ultimately achievement of outcomes must be measured in order to determine if each outcome is attained by the students. However, a pre-implementation survey does facilitate identification of the outcomes that require further scrutiny by faculty as to whether there is a need for action.

SUMMARY

Use of a pre-implementation outcome survey slightly overestimated the extent to which outcome experiences were implemented as perceived by the instructor. However, since post-implementation survey data necessitated only a few action steps, for our purposes the pre-implementation survey was a reliable means of predicting coverage of outcome statements.

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References

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APPENDIX A. OUTCOMES SURVEY LIKERT SCALE

The purpose of this survey is to assess the extent to which the general and professional curricular outcomes are met by the entry level PharmD curriculum.

For each of the outcome statements, indicate on the computer sheet to what extent the outcome is met in _____ (course title) _____.

- 1 = NOT AT ALL. The outcome is NOT a part of the experiences for this course.
- 2 = NOT EXTENSIVELY. The outcome is a minor part of 1 or 2 experiences for this course.

- 3 = SOMEWHAT EXTENSIVELY. The outcome is minor part of several course experiences or is a major part of 1 or 2 experiences for this course.
- 4 = EXTENSIVELY. The outcome is minor part of many experiences for this course.
- 5 = VERY EXTENSIVELY. The outcome is the major part of many experiences for this course.
