An eleven year retrospective review of a progress exam at the College of Pharmacy, Dalhousie University

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BACKGROUND

In 1997-98 the College of Pharmacy, Dalhousie University changed from a lecture-based curriculum to a unique, hybrid, integrated, problem-based learning (PBL) curriculum. Concurrently, a comprehensive student assessment plan was designed and traditional, cumulative end of term/year examinations were eliminated.

With the change in learning and assessment approaches there was a need to ensure that students were acquiring and retaining knowledge as they progressed through the program.

A method used to assess this was a comprehensive, multiple choice question (MCQ) progress exam - an assessment method that measures knowledge acquisition and retention at specific time points throughout a curriculum.

As the progress exam was designed and implemented (see below for details regarding exam description and administration) specific objectives for the exam were developed.

Objectives for students:
- To demonstrate their: 1) overall performance
- 2) knowledge acquisition and application
- 3) knowledge retention

To provide an opportunity to write a comprehensive, cumulative exam prior to writing national Board examinations.

Objective for the curriculum committee:
To examine the results for trends in knowledge acquisition, application and retention.

Question Development, Exam Construction and Administration

Each year, the Undergraduate Curriculum Administrator (UCA) solicits MCQs designed to test all difficulty levels from faculty members.

A 3 person committee (Chair of Curriculum Committee, UCA and Associate Director, Program Evaluation) examines questions for content and face validity.

All new questions and question statistics are added to question database.

The UCA constructs the 100 MCQ exam from the solicited questions and the question database based on blueprint; exam is reviewed by same 3 person committee.

All students in the program write the same exam.

Exam is administered once yearly in the spring.

The progress exam is not used as a mark in any course; however, results are used, in part, to determine those on the Dean’s List.

METHODS

Exam performance was analyzed using descriptive analysis:
- mean raw scores on the entire exam were calculated for each of the 4 years of the curriculum for the classes of 2005 through 2015
- mean raw scores on various categories of questions were calculated for each of the 4 years of the curriculum for the classes of 2009 through 2015
- Results were displayed graphically and examined for trends

RESULTS

Figure 1: Comparison, by Graduating Class, of Annual Performance on the Entire Progress Exam Using Mean Raw Scores

- Mean scores of the entire exam increased annually from Year 1 through Year 3 for each class. Mean scores in Year 4 of the program fluctuated but were generally similar to those of Year 3.
- There are only 12 questions from Year 4 content on the exam which may partially account for these results.

Figure 2: Comparison, by Graduating Class, of Annual Performance on the Biomedical Sciences Portion of the Progress Exam Using Mean Raw Scores out of 15

- Mean Biomedical Sciences scores were highest in the first year for all cohorts except the Class of 2015. The majority of biomedical sciences is learned and tested in Year 1 of the curriculum.

Figure 3: Comparison, by Graduating Class, of Annual Performance on the Pharmaceutical Sciences Portion of the Progress Exam Using Mean Raw Scores out of 33

- Mean Pharmaceutical Sciences scores increased from Year 1 through Year 3 for all cohorts except the Class of 2009. For 4 of the 7 cohorts, mean scores increased only slightly in Year 4. The majority of the material is learned and tested in Years 2 and 3.

Figure 4: Comparison, by Graduating Class, of Annual Performance on the Pharmacy Administration Portion of the Progress Exam Using Mean Raw Scores out of 9

- Mean Pharmacy Administration scores for all cohorts increased from Year 1 to Year 3. Mean scores in Year 4 increased, compared to Year 3, for 5 of the 7 cohorts. There are Pharmacy Administration courses in Years 1.2 and 4.

Figure 5: Comparison, by Graduating Class, of Annual Performance on the Clinical Pharmacy/Pharmacy Practice Portion of the Progress Exam Using Mean Raw Scores out of 43

- Mean Clinical Pharmacy/Pharmacy Practice scores increased from Year 1 through Year 4 for 4 of the 7 cohorts while decreasing slightly from Year 3 to Year 4 in the other 3 cohorts. The majority of this material is covered in Years 2 and 3, with only 9 weeks of new material covered in Year 4.

IMPLICATIONS

- Students’ knowledge did improve over the course of the 4 years of the curriculum, however not consistently in all content areas
- The exam provides an opportunity for students to write a comprehensive exam prior to writing national Board exams
- The Curriculum Committee is using these results to inform the development of the Doctor of Pharmacy Program and determine the role of the progress exam in the new program

Limitations

- As the progress exam is not high stakes, limited resources have been allocated to its construction, administration and analysis
- The reliability of the exam has not been measured
- The difficulty of the exam has not been standardized from year to year
- As no mark is allocated to the exam, and the exam is held during a busy time of the year, anecdotal feedback from students indicates that, unless they want to make the Dean’s list, many of the students do not take the exam seriously and do not attempt to perform well.

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