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Applying Case Methodology to Teach Pharmacy Administration Concepts

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Case analysis was used in this study to develop problem-solving skills of pharmacy students in the area of pharmaceutical management and marketing. Students' report development and communication abilities were measured at the beginning and then again at the end of a course, "Cases in Pharmacy Administration". Performance scores were significantly higher in nine out of ten dimensions measured. In addition, the results of the students' efforts to assist a community pharmacy practice are reported. It was shown in this study that case analysis is an effective methodology for teaching pharmacy administration concepts.

Keywords: Active learning; Pharmacy administration; Problem-based learning; Community pharmacy

INTRODUCTION

Case analysis is an effective teaching methodology that has been used for many years in many different disciplines. This methodology is based on utilizing technical and diagnostic skills to solve problems presented in a maze of data. Students are presented with practice cases and are asked to identify the problem and to make recommendations to solve the problem.

One of the goals of case analysis is to have students more involved in the learning process. This is the underlying philosophy for active learning or problem-based learning. Students learn by doing. The case study approach also involves group participation that provides an opportunity for students to discuss and defend their viewpoints. The format of case analysis involves reading a case,

separating symptoms from problems, and then recommending how to solve problems by manipulation of controllable variables. Learning which variables are controllable is just one of the challenges of this approach.

To evaluate the effectiveness of this teaching approach for a pharmacy administration course was the overall objective of this project. The purpose of this paper is to share the results of this evaluation and to share students' application of this knowledge to assist a community pharmacy.

The purpose of case analysis is to strengthen conceptual and analytical abilities. It also improves written and oral communication skills. Systematic conceptual framework is essential to effective analysis. Students learn how to identify and separate controllable and uncontrollable variables. It develops within students an ability to predict the probable outcome with each intervention. Students evaluate alternative solutions and select the one most likely to correct the problem. Strengths and weaknesses are determined by comparing them with decision criteria that identify limits on resources, NARD (1996).

Past research has shown case analysis to be an effective teaching method. Researchers from several different disciplines have compared case analysis to didactic teaching. According to Wasserman, students are receptive to the case approach to learning (Wasserman, 1993). They feel more involved in the process of learning and believe that they are more involved in their classroom experience. While instructors may find it more time consuming, students report effective learning and retention.

Active learning methods were shown to result in higher student performance in a physiology course

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for physical therapist students when compared with the lecture-only method (Lake, 2001). However, students in active learning sections perceived that they had learned less than students in lecture sections. Also, student perceptions of course and instructor effectiveness were lower in the active learning sections than in the lecture section. Students perceived no differences between the lecture and active learning sections for course difficulty.

Considering self-directed learning an important aspect of the clinical practitioner, Lake (2001) compared student learning and student perceptions of course and instructor effectiveness, course difficulty, and amount learned between active learning and lecture sections of a course. He used 170 physical therapist students in three sections of a physiology course in the first year of their professional program. Course grades and the results of teacher-course evaluations were compared between a lecture section and an active learning section. Course grades were higher in both active learning sections than in the lecture section.

When comparing methods for teaching supervision to medical technology students, researchers found that student ratings on a standardized evaluation were higher for a case analysis course than for all other courses offered by the university (Manuselis *et al.*, 1988). Students believed that the knowledge gained would be useful in the future and felt that the course contributed to their professional growth. Student comments included "This course was appropriate considering we will very possibly hold supervisory positions in the future," and "Presenting case studies was a good way to get class participation," (Zenni *et al.*, 1994).

Objectives of the Study

- To evaluate the effectiveness of the case analysis approach for teaching management and marketing techniques to pharmacy students,
- To have students apply principles learned in Pharmacy Administration (Management and Marketing),
- To assist the managers of a community pharmacy for the indigent with its management problems, and
- To improve the writing and presentation skills of pharmacy students.

METHODS

The students involved in this project had taken a didactic course in pharmacy administration and then in a later semester elected to take "Cases in Pharmacy Administration." This course is a follow-up course to the pharmacy administration course and is targeted to students who want to improve their management skills. The Pharmacy Administration course is primarily didactic and offers little opportunity for active learning. Therefore, the "cases" course is designed to take basic pharmacy management and marketing principles and apply them to pharmacy administration situations. The course objective is for students to develop problem-solving skills using these principles and situations.

Students received eight case studies developed from basic pharmacy management and marketing concepts. For each case they used a case analysis approach, wrote a technical report, and presented their findings to the class. They were expected to defend their recommendations based on the specifics of the case.

Cases for the course focused on pharmacy management situations involving inventory, human relations, product concept, financial ratio analysis, cash flow budgeting, communication skills and pricing pharmaceutical products. Case reports submitted by students averaged three to five pages. Computer generated word processing was required. Spreadsheet development was required for certain projects such as cash flow budgeting. Analysis of written case reports was followed with an assignment to assist an active community pharmacy practice that served indigent patients. It was an opportunity for students to apply their knowledge to assist the managers of a pharmacy practice and to make recommendations to improve the operation of the pharmacy.

Students' ability to analyze cases based on specific pharmacy management concepts was tested at the beginning of the semester and then again at the end of the semester. Students were expected to improve their technical writing skills with each case submitted. Repeating case specifics was not recommended and students were expected to target case problems and recommendations.

At the beginning of the semester, students were given a case analysis to benchmark their problem solving and technical writing scores. Table I shows the elements of case analysis and report development used to evaluate the students' performance at the beginning (T_1) of the semester and at the end (T_2) of the semester. Papers were graded by the course instructor and were evaluated based on the ten items listed in Tables I and II.

RESULTS

Students were graded on 10 dimensions (see Table I) at the beginning of the Spring 2001 semester. Their cumulative scores for each dimension are presented

TABLE I   Case analysis grading criteria

		Scoring								
	Low 1	2	3	4	5	6	7	8	9	High 10
1. Structure and format										
2. Critical factors identified										
3. Symptoms considered										
4. Depth of analysis										
5. Time frame considered										
6. Recommendations address problem										
7. Constraints considered										
8. Application of principles										
9. Writing skill										
10. Presentation of case										

in Table II along with their ending scores. Statistical analysis, a paired t-test, was performed using *Statistix7*®. The results showed a statistically significant improvement in students' scores on nine dimensions of case analysis and no significant improvement in one area.

For their work with the community pharmacy practice, students divided the project into five areas of assistance, as follows.

i. Students conducted a SWOT (strengths, weaknesses, opportunities, and threats) analysis for the pharmacy's management to see exactly where they were and to make strategic decisions for where they needed to go with the future of the pharmacy. In this analysis internal strengths and weaknesses and external opportunities and threats were identified as part of the strategic planning process.

ii. A volunteer satisfaction survey, Table III, was designed and data were gathered to address critical issues identified by volunteers. Because this pharmacy is for indigent patients, it depends heavily on volunteers from the community who donate their time and services to operating the pharmacy. Volunteers include pharmacists, physicians, nurses, and clerical workers.

iii. An operations flow chart was developed to help track patients through the pharmacy operation.

iv. An operational analysis was conducted to determine if there were more efficient ways to handle and organize the documentation that is

TABLE III   Volunteer survey results

	Statement	Result
1.	The workflow of the pharmacy is efficient.	8.14
2.	The waiting and reception area is well managed.	7.70
3.	The eligibility procedure is handled efficiently.	8.43
4.	The pricing process should be located out of the pharmacy department.	7.14
5.	Shelf restocking should be done on days when the pharmacy department is not open.	4.90
6.	There is too much congestion in certain areas of the pharmacy.	8.00
7.	A center walkway is needed to facilitate workflow.	3.90
8.	A cordless phone would help the office staff handle calls more efficiently.	5.20
9.	A cordless phone is needed in the pharmacy department.	7.33
10.	The layout of the pharmacy is the best that it can be.	9.00
11.	The layout of the pharmacy department is the best that it can be.	8.20
12.	The hours of operation are adequate considering resources.	9.00
13.	The process for handling plastic bins is efficient.	7.43
14.	The office area is managed efficiently.	8.90
15.	Eliminating the desk extension, "elbow", in the office area would help traffic flow.	3.80

1 = Strongly disagree......10 = Strongly agree.

TABLE II   Case analysis pre-test and post-test mean scores

		T_1	T_2	p
1.	Structure and format	4.2	8.2	0.0019*
2.	Critical factors identified	3.2	8.4	0.0004*
3.	Symptoms considered	3.2	8.4	0.0004*
4.	Depth of analysis	3.4	8.4	0.0008*
5.	Time frame considered	3.8	8.2	0.0029*
6.	Recommendations address problem	3.6	8.4	0.0002*
7.	Constraints considered	4.6	5.2	0.3046
8.	Application of principles	4.2	8.8	0.0003*
9.	Writing skill	4.0	8.8	0.0002*
10.	Presentation of case	3.8	8.2	0.0001*

*Significant difference.

needed to meet regulations and to run the pharmacy more efficiently. An examination of paper flow in the pharmacy revealed that although the paperwork was managed well and the processes in place were sufficient, several recommended changes could help the workflow in the organization more efficient.

v. A qualitative traffic flow analysis was conducted to demonstrate bottlenecks in the hallways of the pharmacy leading to lost productivity and frustrated volunteers. Students studied the traffic patterns of different groups of individuals within the pharmacy. They color-coded each group. Results were displayed on a poster using the floor plan of the pharmacy. Areas of congestion and intersections were illustrated. This visual presentation made it possible for the pharmacy managers to better design traffic flow by moving certain functions such as pricing to less congested areas of the pharmacy. Fire code violations were also discovered and corrected.

The final recommendations made by the students to the management of the pharmacy are listed below. They are included with this study as a demonstration of the type of pharmacy management and marketing concepts utilized by the students to assist the managers of this pharmacy.

Communication hindrances:

1. *Replace office and pharmacy phones with cordless phones*. This allowed more timely customer service as well as clearer and more effective communication.

2. *Install an intercom*. An intercom system connecting the front office, eligibility office, and the pharmacy helped reduce congestion in the hallways by allowing staff to communicate without leaving their offices. The use of an intercom also reduced client-servicing time and cut down on "misplaced chart" incidence. The intercom was also used to direct patients to the right room or office.

3. *Signage*. Signs were recommended as a supplement to the intercom system to help direct patients in the pharmacy building.

4. *Obtain magnifying glass to read expiration dates*. A magnifying glass with an extension arm reduced time required to sort and label prescription samples and donations.

5. *Place flow check-sheet in patient bins*. Flow check-sheets helped staff place patient bins in the proper location and reduced document processing time and errors.

6. *Color-code patient files*. Color-coding was used as a visual aid in processing patient files and folders.

7. *Sort patient database by dispensing date rather than prescription number*. The database program in the pharmacy offered the flexibility to view patient records according to various sorting criteria. Sorting criteria by date rather than by prescription number helped eliminate the necessity of duplicating prescription labels.

8. *Resolve building and traffic flow issues*. Walkers and other clutter were removed from the hallway because clutter in front of the air return grill placed a heavier load on the air conditioner and translated into higher utility costs, decreased efficiency, and shorter mechanical life. It was also a violation of the fire code. Given the narrowness of the corridors, it is likely that the pharmacy originally received a waiver from the Fire Marshal. These are usually given with the provision that the corridors are kept clear of any clutter.

Pricing of pharmaceuticals was done in the pharmacy, which had very little space for traffic flow. Students recommended that pricing be moved to a less utilized area of the pharmacy since most of this work is done using a computer terminal.

DISCUSSION

This study was an application of case analysis to teach pharmacy administration problem solving to pharmacy students. It involved written cases as well as an actual pharmacy practice. Students' scores for case analysis and report development at the beginning of the semester were compared with their scores at the end of the semester. These results indicated that for nine dimensions of case analysis, students scored significantly higher after taking the course "Cases in Pharmacy Administration." The only dimension not significantly higher was "constraints considered" which referred to the limitation of resources available.

Overall, this project proved to be a rewarding learning experience for these students. An additional benefit was the opportunity for pharmacy students to provide assistance to the managers of a pharmacy practice. Students provided them with a list of recommendations and a technical report addressing their pharmacy management issues. The management and volunteer staff of the community pharmacy felt that they had an objective report to use for improving their operation. The volunteer satisfaction survey gave the volunteer staff an opportunity to voice their opinions in an anonymous way. Most of the recommendations made in the students' report were implemented immediately.

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