

## RESEARCH ARTICLES

### Effect of Pre-class Preparation of Legal Cases on In-class Performance

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**Objective.** This study was conducted to explore whether students who prepare legal cases prior to class display a greater understanding of the material than students who are not expected to prepare.

**Methods.** This study examined pharmacy students enrolled in a pharmacy law course during their second professional year. Students in the course were randomly assigned to 1 of 4 firms. Prior to each class, the members of one firm were responsible for reading a case and being prepared to present information on it. Only that firm's members were given the case before the class period in which it was to be covered. During class, students in the firm were called upon to present the facts of the case and the principles of law that were applicable to pharmacists. Essay questions on the examinations were used to determine if those who were expected to prepare for the class outperformed those who were not expected to prepare.

**Results.** Only 1 firm outperformed the other firms on identifying issues covered by their case. The scores of students from different firms did not differ across the 3 examinations given during the course.

**Conclusions.** These findings suggest that it is not necessary for instructors to make sure all students have access to cases before class when using case-based education.

**Keywords:** student preparedness, case-based teaching, teaching methods, pharmacy law, Socratic method

## INTRODUCTION

Instructors in pharmaceutical education employ a diversity of methods to teach the content covered by their courses. These methods range from lectures to more active-learning methods, such as problem-based learning (PBL), Web technology, and case-based education. These techniques are designed to actively engage students in the learning process.<sup>1-5</sup> Furthermore, as one author suggested, this "systematic, cognitively based approach to problem solving is a 'natural' consequence of a curriculum designed to produce critical thinkers."<sup>5</sup> The Socratic method is a teaching strategy employed extensively in legal education. Though different versions of the Socratic method abound, its central tenets remain constant in that a student is required to be an active participant in her educational process of learning. Typically, this style of teaching requires the student to be prepared with each day's material as she enters the classroom. To demonstrate student preparedness, students are randomly selected to answer questions and present information

to the rest of the class. Failure to be prepared when called upon can result in anything from the lowering of one's grade to embarrassment in front of one's peers. Like the strategies employed in pharmacy education, the Socratic method enhances the ability to reach higher-order learning and build on knowledge students have gained outside the classroom.

While a wealth of studies that deal with various methods of teaching in pharmacy education have been published, very little is known about how the Socratic method might be employed in schools of pharmacy.

This article presents the findings of a study that investigated a teaching strategy similar to the Socratic method. It was similar in that it required a subset of students to prepare before class, but different in that all students were not required to prepare before the class period. Given the difficulties in having students prepare before class, this study set out to investigate whether this preparedness would have an influence on performance in the class.

## BACKGROUND

Significantly higher grade point averages are associated with students who are presented with written mate-

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rial before oral presentations than with students who were presented with written material after oral presentations.<sup>6</sup> Additionally, students who are motivated to complete readings before class arrive prepared to operate at least at the knowledge level of Bloom's (1956) taxonomy.<sup>7</sup> It is reasonable to believe that if students prepare before class they are prepared to recall relevant information from assigned readings and have established a foundation for in-class discussions at the more sophisticated cognitive levels of application, analysis, synthesis, and evaluation.<sup>8</sup> As educators, we should be more than mere disseminators of information; we should encourage students to attain a higher level of learning. But, it is not reasonable to believe that all students will prepare the materials that have been assigned before class.

The teaching process does not stop with merely giving the students the material before class. There must be a period of asking the students questions regarding the material that they have prepared. If the students are told to prepare for class but are never held accountable for the information, they will soon learn that lack of preparation will not result in any adverse consequences. To combat this problem, is it enough for an instructor to simply ask for volunteers in answering questions? According to the few studies of the comparative effects of the expectation of random vs voluntary oral questioning, preparation for classes is greater among students who expect to be called on at random.<sup>8</sup> These findings have been demonstrated among community college students enrolled in an introductory psychology class<sup>9</sup> and among undergraduate education majors enrolled in a test and measurement class.<sup>10</sup> One explanation for this result is the tendency for the same individuals to volunteer in answering questions. This behavior makes it more difficult for reserved students to contribute to the class, causing these students to become frustrated and disinterested. Also, students exposed to random oral questioning learn that they will be held accountable for their level of preparation during each class, whereas students exposed to only voluntary oral questioning learn that they will be held accountable much less frequently (eg, examinations).<sup>8</sup> Finally, another benefit in the use of random oral questioning is the potential to increase a student's retention of the material. McDougall and Granby found that students who expected random oral questioning expressed greater confidence in their reading recall.<sup>8</sup> In addition, Christensen found that random questioning increased student confidence, subsequently causing students to volunteer answers, offer comments, and ask questions more readily.<sup>11</sup> As future pharmacists, it is imperative that students acquire

the confidence and skills needed to serve their patients. Another necessary element of random questioning is having a time frame that causes the students to reasonably expect to be called upon during a class period.

While this method has been the subject of a study in a pharmacology course, no such studies were found regarding this technique in a pharmacy law course. Waterhouse and Mennear found that the Socratic method fosters student participation as students are called upon to discuss an assigned case and this may lead to better performance on examinations.<sup>12</sup> Furthermore, pharmacy students who participate in a case-based format vs a standard didactic format may have better retention of the material.<sup>13</sup> While higher examination scores are a favorable outcome, the purpose for implementing the Socratic method in the pharmacy law class was to force the students to identify and spot potential problems before they occurred. Is this greater retention a result of the preparedness that takes place before class or the discussion that takes place during class?

The findings from previous research seem to indicate that having students prepare before class and holding them accountable during class might have benefits, but these findings do not answer the question of whether the expectation of preparing before class would influence performance. By conducting this research, it was hoped that the findings would provide direction as to whether preparing before class was a necessary aspect of student performance.

## **METHODS**

Sixty-three students from the 2001 Bachelor of Pharmaceutical Sciences class participated in this study. (The course was taught in 2 sections, which allowed for more discussion and interaction than would be available in a large classroom setting.) Pharmacy law cases were used as a means of facilitating classroom discussion. Issues that were considered in conducting the study included developing a manipulation that did not completely withhold the information from the students, but enabled us to study the influence that preparedness has on student identification of specific legal principles in the course and developing a consistent examination that allowed us to assess the influence of student preparedness. To deal with these issues, the following methodology was employed.

Students in each section of the course were randomly assigned to one of 4 firms (groups), consisting of 8 or 9 members. Listing each section's students alphabetically by last name and then simply assigning a 1, 2, 3, or 4

to each student in a consecutive manner achieved this division. As a result, there were 2 firms numbered 1 (1 in each section), 2 firms numbered 2, and so on. Firms in different sections with the same numbers were treated the same (ie, received the same cases). The class was split to facilitate discussion and to increase the likelihood of each firm member being called upon in each 1-hour class period. The only significance of firm assignment was to identify which students would be expected to have prepared material for a particular class. Once a student was called upon to participate, it was their responsibility to discuss the relevant information from the assigned case. This duty could not be delegated to other firm members. As such, each student was given a final participation grade based on their preparedness throughout the semester.

Each member of a firm received the case (material) to be covered during the class period prior to the group's assigned day. Only the members of the firm received the cases. At the beginning of class, the instructor presented some background material in a lecture format. Then, students in the firm were called upon to present the facts of the case and principles of law that applied to the pharmacist. Any issues deemed important by the instructor were discussed whether or not the students had presented them. In addition, the students were asked various questions pertaining to the cases. Students did not know beforehand when they would be called upon to participate in class. As a result, each firm member was expected to have prepared for that day's classroom discussion. This method was chosen to ensure that the group that was assigned the case would actually prepare the material. In other words, it helped to ensure that the intervention being studied actually took place. The lecture and discussion ensured that students were exposed to all of the information and the lecture gave all of the students the opportunity to be exposed to the materials before the discussion began. The authors believed this method of teaching provided students with ample opportunity to learn the information associated with the various cases. In other words, all students were exposed to the issues in all of the cases during the class periods, but only 8 or 9 students (one firm for each section) were given the materials before class and were expected to prepare well enough to answer questions about the materials. This methodology isolated the differential effect that preparing before class would have over simply discussing the cases within class time.

One of the objectives in the pharmacy law course was to provide each student with a greater ability to spot issues and potential problems before they occur. This

was partially accomplished through student participation in the discussion. However, a more objective assessment was needed to analyze whether those students who were expected to prepare outperformed those who were not expected to prepare. Three examinations were given to assess student performance. Though each examination contained an objective portion comprising multiple choice and fill-in-the-blank items, essay questions were given as the means of measuring each student's ability to spot key issues. This method was selected in part because of Background Paper II from the Commission to Implement Change in Pharmaceutical Education, which recommends using examinations that require written analysis of problems.<sup>14</sup>

Each essay question contained multiple issues and the issues corresponded with those covered by particular cases assigned to the different firms. An example essay question is presented in Appendix 1. The examination's essay questions were not identical to the ones discussed in class because the goal here was not to have the students simply recite memorized information. Rather, it was hoped the students would take the information that they learned and apply it to the scenario presented in the essay question. The 4 firms had approximately equal opportunity to identify their particular issues on each examination. The reasoning for this was not to reward or penalize a firm on the examination, but to give each group an equal chance to perform in the event that there was a beneficial effect of having the materials before class. Before the examinations were assessed, a list of critical issues was determined for each essay question. In addition, specific issues only present in the cases were further identified. When grading the examinations, a student would be given credit (points) for each issue they identified. If the particular issue was unique to one of the cases covered in class, a special notation was made. Once an issue on a particular essay question had been mentioned, the student would not receive credit for mentioning that same point again unless it pertained to other issues. Then, the total number of points was tabulated, with the student receiving a numerical score for each essay question. The list of issues was not exhaustive in that if a student identified an important issue not contained in the list, the student was still given credit for identifying that relevant point. Issues were linked back to the specific cases that each group should have prepared in advance. If preparation of a case before class influenced recall or retention of the materials, firm members would outperform their classmates on the issues that corresponded with the cases they were expected to pre-

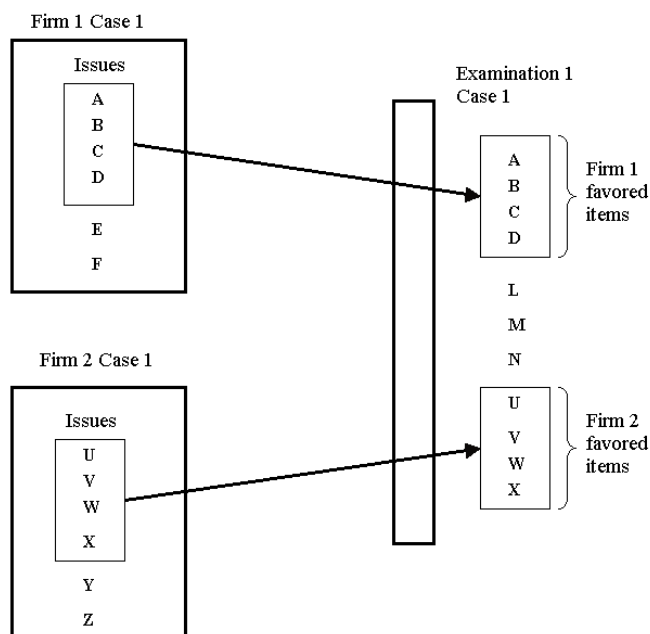


Figure 1. A graphical representation of how the issues in the cases were linked to the cases on the examination.

pare (Figure 1). Each firm received an equal number of cases during the semester and essay questions on the examinations encompassed issues from multiple cases.

Additionally, the grader was blinded to the students' names, firm assignment, and case assignment in that each student was given a code number. This code number was the only means of identifying a student's examination. Only after the examinations were graded were the student's names and code numbers matched. Before the course was started, the methodology and protocol were reviewed and approved by the University's Institutional Review Board (IRB).

## RESULTS

The students in both sections performed similarly on the 3 examinations. The mean score of each section's overall numerical average on the 3 examinations was 90.7% and 89.2%, respectively.

There were a total of 7 essay questions given on 3 examinations. When evaluating firm members' essay question performance on identifying issues that were covered by the cases that they were assigned (favored), only 1 firm's members (Firm 3) outperformed members from the other firms (Table 1). Firm 3 members identified 32 favored issues across 3 examinations, compared with an average of 21.6 issues identified by students who were not in Firm 3. Upon initial review, the data appeared to indicate Firms 1, 2, and 4 actually did worse when their issues were favored, but these differences

were not significant. The 7 essay questions were significant predictors of examination performance (adjusted R square = 0.655). Though the essay questions comprised only 20% to 35% of the overall examination questions, the essay scores explained 65.5% of the variance in students' examination scores. Analysis of variance revealed that the groups did not significantly differ on their performance in the course as measured by the mean total of all examination scores (Table 2).

## DISCUSSION

Only 1 pair of the 8 firms (Firm 3 from each section) identified significantly more issues from the cases that they were assigned compared with the other members of the other firms who had not been given the cases before class. This result may appear to be a disappointing outcome in that it might indicate that preparation before class did not influence the overall examination score or performance on the task of identifying issues on the examination cases. The findings, however, are encouraging in that all the firms performed at an equally exceptional level as evidenced by the mean total examination scores. This seems to indicate that within the context of the manner in which this course was taught (lecture with discussion of the cases), the expectation of advanced preparation and access to the case materials did not seem to provide students with an advantage over their classmates. In other words, in this course, the access to the

Table 1. Mean Number of Issues Mentioned by Group (*t*-tests)

Group	No. of Students	Mean (SD)	<i>P</i>
1 (favored)	17	38.4 (9.17)	0.787
2, 3, 4	46	39.1 (10.20)	
2 (favored)	17	32.3 (9.28)	0.916
1, 3, 4	46	32.5 (7.12)	
3 (favored)	15	32.0 (13.00)	0.004
1, 2, 4	48	21.6 (11.22)	
4 (favored)	14	16.0 (5.92)	0.190
1, 2, 3	49	19.5 (9.54)	

Table 2. Total Mean Examination Scores Achieved by Group (ANOVA)

Group	No. of Students	3 Examination Mean (SD)	<i>F</i>	<i>P</i>
1	17	265 (27.5)	0.738	0.534
2	17	269 (23.4)		
3	15	277 (18.5)		
4	14	267 (21.1)		
Total	63	269 (23.0)		



cases beforehand and the advanced preparation did not appear to offer any advantage in performance, with the exception of one group. This methodology has some limitations; therefore, the findings of this study are somewhat limited. Although unlikely, it is possible that the students who had the cases shared them with their classmates. While there is no evidence that this occurred, if it did then it might be expected as an outcome of this strategy. Another limitation of this study is that this course was taught in 2 sections. These sections possibly were treated differently by the instructor. Every effort was made to treat the sections equally and to help ensure that this would have a limited effect on the results (ie, there were two group 1's in each section, two group 2's in each section, etc).

Further study on this method of teaching is warranted; nevertheless, this study provides interesting dialog on whether ensuring exposure to course material prior to classroom discussion effectively ensures students' success in a pharmacy law class.

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## Appendix 1. Example of an essay question given to students enrolled in a pharmacy law course.

Due to the increased business at Big Al's Pharmacy, Curley Stooze, RPh, decides to hire a Pharmacy Technician. Since Curley barely has time to breathe, he hires Roscoe, the first person who comes in the pharmacy inquiring about the job. When Roscoe asks Curley when would be a good day to start work, Curley responds that "tomorrow sounds good to me." Roscoe agrees and begins working the next day in the pharmacy area. Roscoe is a quick learner and in no time, he is ringing up customers on the register, entering information into the computer, and taking prescription orders from physicians over the phone.

One day, a patient comes into Big Al's to get a new prescription filled. Since Curley is on the phone (as always), Roscoe takes the prescription and pulls the medication off the shelf. As Roscoe is examining the prescription further, he notices the medication is for one of his neighbors. Roscoe did not recognize his neighbor when presented with the prescription earlier, partly because this neighbor was wearing an Oklahoma Sooners hat. Roscoe looks at the prescription again and realizes the medication is to treat an STD. After Curley verifies the prescription, Roscoe begins to counsel his neighbor about the medication. The neighbor is ready to leave and does not want any information regarding the medication.

The next morning, one of Roscoe's buddies, Cletus, comes in the pharmacy to get a Coke. As Cletus is paying for the Coke, he notices Roscoe and walks back to the pharmacy area. Roscoe tells Cletus the following, "You are not going to guess what my neighbor has been doing. I filled a prescription for him yesterday for an STD." Cletus begs Roscoe to tell him which neighbor it was that had the prescription filled. After much hesitation, Roscoe tells Cletus the neighbor was Boss Hogg. Roscoe then turns around and notices Boss Hogg's wife standing in the next aisle.

Based on the above facts, identify and discuss the relevant issue(s) in this case and what step(s), if any, Roscoe, Pharmacy Technician, and Curley, RPh, should take: