RESEARCH ARTICLES

Faculty and Student Perceptions of Effective Study Strategies and Materials

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Objectives. To evaluate faculty members' and students' perceptions of study strategies and materials.

Methods. Focus groups were conducted with course directors and first- and second-year students to generate ideas relating to use of course materials, technology, class attendance, and study strategies for mastering class concepts.

Results. Students and faculty members differed in their opinions about the utility of textbooks and supplemental resources. The main learning method recommended by students and faculty members was repeated review of course material. Students recommended viewing classroom lectures again online, if possible. Course directors reported believing that class attendance is important, but students based their opinions regarding the importance of attendance on their perceptions of lecture and handout quality. Results did not differ by campus or by student group (first-year vs. second-year students).

Conclusions. Students and faculty members have differing opinions on the process that could influence learning and course design. Faculty members should understand the strategies students are using to learn course material and consider additional or alternative course design and delivery techniques based on student feedback.

Keywords: technology, focus group, learning, course design

INTRODUCTION

With the availability of technology and a new generation of learners, higher education is changing.[1] The availability of online courses, degrees, and learning tools has made traditional, live lectures and traditional textbooks no longer essential to learning. However, faculty members may be reluctant to embrace new technology and teaching methods, such as online learning or team-based learning, and may not have an understanding of students' learning strategies and approaches to mastering course material.

Students and faculty members may have differing opinions about the learning process and recommended course materials that could influence learning and course design. A previous study involving physical therapy students found no difference in learning style and course success but did find improved understanding and demonstration of clinical concepts with the use of technology to enhance learning.[2] An anatomy course found that lower-performing students used computer resources less frequently.[3] Learning approach research conducted among Australian pharmacy students concluded that students prefer vocationally related teaching strategies, where course material could be applied in the professional setting.[4,5] Another study characterized student pharmacists' perceptions of testing, study strategies, and recall.[6] Garavalia and colleagues compared student pharmacists' perceptions of motivation and learning strategies at different points in the curriculum.[7] They concluded that first-year students were more externally motivated than were third-year students, who relied more on intrinsic material that could be applied in the professional setting.[7] Literature on student and faculty member perceptions of specific study strategies and materials is scarce.

Focus groups have been useful in providing insight on specific topics.[8,9] They can be used to gather opinions outside of consensus, provide detailed information on student perceptions, clarify research findings or design subsequent research, and inform program pre-planning, reconfiguration, and assessment.[8,9]

The University of Tennessee College of Pharmacy (UTCOP) conducts synchronous distance learning between the Memphis and Knoxville campuses for 3 semesters starting in the second year. Didactic lectures and select recitations for required courses are recorded using Mediasite (Sonic Foundry, Madison, Wisconsin) and are posted on a secure Web site. At UTCOP, an audience

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response system, TurningPoint 2008 (Turning Technologies, Youngstown, Ohio), is used in the didactic portion of the curriculum for feedback during lectures and recitation sessions, attendance, and graded activities.

The purpose of this study was to characterize and compare faculty member and student perceptions of study strategies and materials. Focus groups were conducted to generate ideas relating to use of course materials, technology, class attendance, and study strategies for mastering class concepts.

METHODS

Previously published focus-group methodology was followed.[8,9] Students were randomly selected to participate in the focus group based on campus involvement, leadership positions, cumulative grade point average, and campus location. All course directors on the Memphis and Knoxville UTCOP campuses were invited to participate in the faculty focus group. Each invited participant received an e-mail describing the project goals, the investigators' names (1 Memphis faculty member, 1 Knoxville faculty member, and 1 fourth-year student), potential focus group members, and notification that the discussions would be audio recorded.

Focus groups were conducted separately with the faculty group composed of course directors on both campuses and 2 student groups stratified by year for the first- and second-year students. Each session was conducted simultaneously between the Memphis and Knoxville campuses in April and June 2010 and led by the student investigator. The faculty investigators served only as observers during all focus group sessions. At the time of the study, none of the students in the focus group were enrolled in either of the faculty investigators' courses. Demographic information about all participants was collected anonymously during the focus group sessions and analyzed in a relational database.

During the 75-minute focus groups, participants were asked to provide their perceptions about how courses are successfully completed by answering 10 predetermined questions (Table 1). Focus group questions were determined based on a preliminary e-mail survey tool administered to students who had successfully completed the first and second years of the professional curriculum. The survey instrument solicited strategies for successful course completion for each course in the first and second years of the curriculum. Open-ended questions pertaining to student learning techniques and resources were assessed for themes and used to generate questions for the focus groups. Major trends emerging from this assessment included class attendance, regular review of course materials, use of recommended readings and textbooks, use of TurningPoint software, questions by classroom instructors, seeking assistance from upperclassman, and review of lectures on Mediasite. Despite not being mentioned in the survey tool, additional questions pertaining to teaching assistants, examination review, and use of Blackboard (Blackboard, Inc.,Washington, DC) discussion boards were included because faculty members perceived these strategies to be useful for student learning.

In all focus groups, each question was read to the entire group, and participants were invited to state their opinions. General questions on course materials and student success were presented first, followed by more detailed questions on classroom attendance and use of technology (eg, TurningPoint and Mediasite).[9] Similar questions were grouped together. Students and faculty members were not required to respond to any question but were encouraged to comment even if they were not in consensus with the group. Each focus group session was recorded to aid in identifying responses with consensus between faculty members and students, but names were not recorded with any responses.

The student investigator acted as moderator and the 2 faculty investigators as assistant moderators. The moderator initiated and kept the discussion focused, subtracted and added questions following the direction of the dialogue, and sought clarification as time permitted. The assistant moderators, one located at each campus, were observers and

Table 1. Questions Asked of Student and Faculty Member Focus Groups

1. How useful do you find the recommended/required course textbook?
2. How useful do you find supplemental material (ie, articles, guidelines, *APhA Complete Review*, *Lippincott's*)?
3. Do you find it helpful to review the material daily, weekly, or just before a test?
4. Do you find it helpful to read the recommended reading or review the lecture notes before class/recitations?
5. How often do students utilize teaching assistants for help? Upperclassmen?
6. How important is it for students to attend class?
7. Does the use of Turning Point enhance learning in the classroom?
8. Do you think it is helpful to watch lectures again on Mediasite. If so, do you watch the entire lecture again or just sections?
9. Do you think discussion boards on Blackboard are helpful?
10. Do you ever review your exams? Is it helpful?

Note: Questions were appropriately altered for the faculty focus group session.

Table 2. Demographics of Student Focus Group Participants

Demographic	
Sex (female), No. (%)	7/15 (47)
Age (years), mean (SD, range)	25.3 (3.12, 22-33)
Memphis campus, No. (%)	10/15 (67)
Undergraduate degree (BS, BA), No. (%)	12/15 (80)
Cumulative GPA, mean (SD, range)	3.44 (0.33, 2.98-3.9)
Number of memberships in organizations, mean (SD, range)	3.1 (1.1, 1-6)
Number of leadership positions, mean (SD, range)	1.9 (1.3, 0-4)
Participation on college committee, No. (%)	2/15 (13)

note takers who also monitored the technology throughout the session. After each focus group session was completed, the moderator and assistant moderators discussed the success of each focus group and general themes were assessed. The moderator transcribed the responses and common themes were grouped together.

This project was granted exempt status by the University of Tennessee Investigational Review Board. All participants provided informed consent.

RESULTS

The demographics of focus group participants (students n = 15, faculty n = 11) are detailed in Tables 2 and 3. The majority of participants in both the faculty and student groups were male and located on the Memphis campus. Student participants were high achieving in all facets of professional education, including academics, leadership, and professional involvement. Faculty participants were experienced course directors with a mean of 6 years of course coordination. More than two-thirds were licensed pharmacists in the department of clinical pharmacy, with the majority (75%) being board-certified pharmacotherapy specialists.

Table 4 provides a comparison of the student and faculty focus group responses. In general, students and faculty members agreed that regular review of material and quizzes is a potential strategy for course mastery. Students and faculty members agreed that Turning Point enhanced learning by maintaining student engagement, providing immediate feedback, and reinforcing concepts.

Students generally did not use the required course textbook(s) with some exceptions (ie, Therapeutics, Self-Care and Nonprescription Drugs). Compared with second-year students, fewer first-year students found the mandatory textbooks useful. With the exception of clinical practice guidelines, students rarely used supplemental articles but frequently used other non-recommended review books.

Students expressed a preference for engaging lectures but still expect all pertinent information to be included in handouts. Although course directors stated that attendance

was important, for some students, the instructor providing a detailed handout may have decreased the likelihood that they would attend class. The main learning method recommended by students was to review the course material regularly. Although second-year students recommended viewing classroom lectures again on Mediasite, they reported selectively viewing key segments rather than the entire lecture. They described the utility of viewing pharmacokinetic recitations on Mediasite because the recording could be paused while each section of the problem was worked. Students also stated that while they want to learn for long-term success, they focus their studying on material included on examinations. Faculty members agreed that students want to be successful on examinations and perceived that students prioritize successful course completion. However, faculty members want students to learn for long-term success. Although the groups agreed that examination review is helpful, especially in courses with cumulative examinations, faculty members reported that only a small percentage of students reviews

Table 3. Demographics of Faculty Focus Group Participants (N = 11)

Demographic	
Sex (female), No. (%)	5 (45)
Memphis campus, No. (%)	9 (82)
PharmD degree, No. (%)	7 (64)
Other (PhD, JD), No. (%)	7 (64)
Licensed pharmacist, No. (%)	8 (73)
BCPS certification, No. (%)	6 (55)
Department of Clinical Pharmacy affiliation, No. (%)	8 (73)
Participation in a teaching certificate program, No. (%)	4 (36)
Number of years on faculty (all universities), mean (SD)[a]	11.7 (8.0)
Number of years of course coordination, mean (SD)[b]	6.4 (16.0)

[a] Number of years on faculty, range = 3-23.
[b] Number of years of course coordination, range = 1-20; median = 3.

Table 4. Comparison of Faculty and Student Focus Group Responses

Question	Student Response	Faculty Response
How useful do you find the recommended/ required course textbook?	• Do not find most course textbooks helpful. • Exceptions: *Pharmacotherapy* and *APhA's Handbook of Non-Prescription Drugs*.	• Course textbooks are very useful, but students don't routinely read them.
How useful do you find supplemental material (i.e. articles, guidelines, APhA Complete Review, Lippincott's)?	• The *APhA Complete Review* and *Lippincott's Illustrated Reviews: Pharmacology* are useful. • Some articles useful, but few read students read them.	• For some courses it is crucial because guidelines may be updated more often than textbooks. • Others felt that extra materials could overwhelm students.
Do you find it helpful to review the material daily, weekly, or just before a test?	• Daily is ideal, but it rarely happens. • Unannounced in-class quizzes force students to review material periodically and some mentioned they did exceptionally well.	• Reviewing the material regularly is ideal but it rarely happens. • Some use in-class quizzes to encourage students to study material regularly.
Do you find it helpful to read the recommended reading or review the lecture notes before class/recitations?	• Most do not routinely review lecture notes or recommended reading before class. However, if it was done then it was helpful.	• All agreed that that they believe it is helpful.
How often do students utilize teaching assistants for help? Upperclassmen?	• Rarely use teaching assistants. • Although, they found it useful when they did.	• Dramatically decreased over the last few years and it is extremely minimal now.
How important is it for students to attend class?	• Students attend class based on professors and lecture style. • If information can be inferred from the lecture notes, then they might not attend class and self-study.	• Course directors feel that attendance is important and that it is up to the faculty to make attending class worthwhile.
Does the use of Turning Point enhance learning in the classroom?	• Turning Point is very helpful in enhancing learning in the classroom.	• Turning Point is very helpful in enhancing learning in the classroom.
Do you think it is helpful to watch lectures again on Mediasite. If so, do you watch the entire lecture again or just sections?	• Students find both helpful. • They find it especially useful when working through kinetics problems from lecture.	• Faculty don't know the extent of Mediasite usage.
Do you think discussion boards on Blackboard are helpful?	• In general, students don't use them.	• They are useful to answer questions in a way that all students can benefit. • Usage has declined over the last few years.
Do you ever review your exams? Is it helpful?	• A few find it helpful and all agreed that it is helpful in classes with cumulative exams.	• A small proportion of students review their exams. • It is important to see what types of questions are being missed by the student.

their previous examinations. Finally, there was consensus among all groups that, in general, students rarely seek help from teaching assistants or review their examinations and that the use of these resources continues to decrease. Results did not differ by campus or by student group (first-year vs. second-year students).

DISCUSSION

The results of this study can help increase student pharmacists' and faculty members' understanding of the strategies and materials that are most useful in mastering the didactic curriculum. For example, although faculty members perceive that students should find discussion boards useful for posting questions and accessing faculty member responses, students generally do not use them. Perceptions regarding the usefulness of course textbooks also were discordant between faculty and student focus groups. Although students perceived a few course textbooks, such as *Self-Care and Nonprescription Drugs*, to be useful, it is questionable whether students are using these textbooks to supplement information provided in course lectures or to complete course assignments or online quizzes. Faculty members also continue to provide supplemental course materials, although students rarely use them. Both groups recommended that regularly reviewing course material was essential for course mastery and agreed on the value of the audience response system to enhance engagement and learning through recall and immediate feedback. These findings are consistent with other literature describing the use of this technology in schools and colleges of pharmacy.[10-12]

This is the first paper in the pharmacy education literature to discuss specific study strategies and materials, but our results are consistent with those in the non-pharmacy literature. A study of dental students found that learning tools provided by faculty members and outside references were equally helpful.[13] A study in undergraduate economics and accounting courses found that offering extra credit as an incentive for students to document their reading led to high textbook use.[14] However, another study that did not incentivize students found that less than 20% of undergraduate students used course textbooks.[15] Both studies found that higher-achieving students used textbooks more often and read the text more in depth than lower-achieving students.[14,15]

Our study has several limitations. We defined course mastery as learning and retaining concepts in the course and achieving a satisfactory grade (by the student's definition). A satisfactory grade is subjective and uniquely defined by each student within each course. We did not correlate teaching effectiveness to course mastery as measured by academic performance (ie, grades). While student participant lists were randomly generated to select

students with varying academic and leadership skills, participation was optional; thus, the students who agreed to participate may have been those who were the most motivated and outgoing. However, based on our experience, the majority of students are involved in student organizations and hold leadership positions, and approximately two-thirds of the students are at the Memphis campus, which correlates with the demographics of the student focus groups. Similarly, the majority of enrolled students are admitted with undergraduate degrees. Therefore, we believe that the demographics of the student focus groups are consistent with the overall student body of UTCOP.

CONCLUSION

The implications of this study are for faculty members to understand the strategies students are using to learn course material. Faculty members may not always accurately perceive student practices and study techniques. Based on the incongruity of student and faculty member opinions regarding the utility of course materials, such as textbooks, faculty members may want to consider additional or alternative course materials based on student feedback. Use of technology, such as recording lectures and using an audience response system, should also be encouraged. Future student pharmacists can use this information to guide their use of technology, course materials and other resources to help them master the didactic curriculum.

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