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Back to basics- Are traditional teaching methods obsolete?

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BACK TO BASICS - ARE TRADITIONAL TEACHING METHODS OBSOLETE?

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ABSTRACT: A survey requesting students to assess components of effective learning was presented in four forestry courses - one at each undergraduate academic level. A total of 120 students received the survey and 118 returned it. Results clearly indicate that students rank instructor attitude and subject matter as the most significant factors to effective learning. Course style and format were much less important, although students have a clear preference for any format that provides hands-on experiences. While most students are familiar with some forms of teaching technology, they only rated it as somewhat effective to the learning process.

INTRODUCTION

As many colleges and universities reexamine their instruction missions, issues of academic excellence and scholarship in the classroom are raised. This naturally leads to discussions of measuring teaching quality and, at least at our University, the issue of the use of innovative techniques and technological teaching tools as one measure of teaching excellence. In many cases, use of technology in the classroom is essential - new technological tools are available to foresters and other natural resource professionals that must be incorporated for instruction to be up-to-date, computer labs allow for the solving of more complex problems, and technology can speed information retrieval. Whether or not these new technologies and methods encourage excellence in teaching or are meaningful measures of quality teaching remains, to us, an open question. Many forestry courses deal with basic information that must be mastered before tackling more complex problems and both authors have fond memories of instructors who could hold a class spellbound using nothing more complicated than a chalkboard. Our objective was to find out from our students what was important to them in defining quality instruction and to ascertain the degree to which they use technology in the classroom and its perceived effect on their ability to learn. Students are the target audience because the single most important evaluation of teaching quality at the University of Kentucky comes from student course evaluations and the factor used in annual merit and promotion decisions is the student rating of overall teaching quality.

METHODS

An “Education in Natural Resources Survey” was developed to solicit information from our students. The survey was presented to our freshman introduction class, a sophomore level soils class, a junior level measurements class, and a senior level timber management class. These latter three classes are composed almost exclusively of forestry majors, while the freshman course is open to anyone and contains a substantial number of non-majors and non-freshman. The combined enrollment of the four classes was 195 students. The surveys were handed out in each class, unannounced, on the same day. Since there is always some absenteeism and since some students were enrolled in more than one of these classes, our total sample population was 120. From these individuals, 118 surveys were filled out and returned. The survey included open-ended questions concerning factors of positive and negative learning experiences, direct questions concerning technology use and its effectiveness on learning, and direct questions concerning the effectiveness of various class structures. Students were asked to incorporate all of their college experiences into their answers. A copy of the survey can be found in Table 1.

RESULTS AND DISCUSSION

A summary of the results for each survey question is presented in bold text on the survey form in Table 1. Questions 1 and 2 asked students to list the three things that make an excellent learning experience and three things that detract from a learning experience. Since these were open-ended questions, the data had to be categorized, resulting in 19 categories for Question 1 and 18 for Question 2. The five most frequently listed categories, with the percentage of students who listed them are included for each question. For both questions, these five listed categories account for more than 50 percent of the response frequencies. It is interesting to note that for both questions, these categories include factors that can be controlled by the instructors as well as factors that are completely outside their control. The most important factors of a positive learning experience concerned the instructor’s

attitude and willingness to help outside of classes, the student interest in and perceived relevance of the material, and the ability to get hands-on experience. Similarly, the most frequently cited negative factors included the instructor's lack of organization and perceived negative attitude. The quantity and difficulty of the work were listed, but less frequently than instructor attributes and scheduled class time. It is interesting to note that while interest in the subject matter was listed as a strong positive factor in learning, lack of interest in the subject matter did not diminish the effectiveness of learning.

Questions 3 and 4 concerned the types of technology students had been exposed to and its perceived effectiveness on their ability to learn. Responses were ranked on a 1-5 scale with 1 being much easier and 5 being more difficult. Results indicate students routinely use some forms of technology. The majority use PC labs, E-mail, and the Internet or WWW. Noticeably fewer reported using on-line library reference services. What this might imply is, perhaps, a topic for further investigation. The vast majority reported that technology made learning somewhat easier. Whether this is due to the limits of the technology or the familiarity of students with technology is also a topic for further investigation. In other words, university computer labs cannot always afford to have the latest equipment, and current students have, for the most part, grown up with the technology. They are less awed by it and, perhaps, have less appreciation of its power as few have memories of performing the same tasks by more laborious methods before technology was available. Negative comments included difficulty with the technology itself as well as difficulty with its accessibility. This last point may also warrant further investigation as technology that is out of date (which many university computer labs are given the speed of technological updates), difficult to use or has limited accessibility may be more of a hindrance to learning than a help.

One of the reasons often quoted by our faculty for developing and employing innovative teaching methodologies is a perceived dissatisfaction with the effectiveness of the traditional lecture method, especially for certain types of material. To a degree, our survey supported this. In the fifth question we asked students to rate the effectiveness of various class styles (lecture, lab, etc.) in helping them learn new material. While relatively few students rated any style as ineffective or highly ineffective, some definite preferences were observed. The majority of students rated lectures as effective, but few rated them as highly effective. In fact, more students rated them as neutral. Labs, however, were another matter. Eighty percent of the students rated them as highly effective or effective, with an almost even distribution between these two categories. This is consistent with the responses to Question 1 where hands-on field work was reported as beneficial to learning. Students seemed to rank discussions/ recitations somewhere between lectures and labs in the highly effective category. This is not a class style employed very often in our forestry curriculum, so most students are exposed to this teaching style in other courses (usually prerequisites) across campus. Independent study was ranked rather evenly between highly effective, effective, and neutral. This is a learning mechanism many of our students are not exposed to and, indeed, there were fewer responses to this part of the question. Also, some students take independent study courses out of genuine interest while others simply use them to add hours to satisfy graduation requirements. Internships are another learning device many of our students do not get exposed to as shown by the large number who reported no opinion. Students who had experience with internships, however, overwhelmingly ranked them as highly effective. This was not surprising given the students' expressed desire for hands-on experience. The response to seminars was also not surprising given the students' general lack of familiarity with them (note the no opinion count). Most found them to be neutral or effective, and few found them highly effective. Undergraduates are not normally exposed to graduate-style seminar courses, and seminars offered in our department, while open to everyone, are generally research oriented presentations by faculty and graduate students. Some undergraduates do routinely attend, but most do not have the scientific background yet to fully appreciate the content or its placement in the broad scheme of the field.

Question 5 is, perhaps, somewhat simplistic and specific conclusions should be drawn with some caution. One issue this question did not address, but which would be interesting to discover, is the interaction between a student's rating of class styles and their experiences with specific courses taught using these styles. Both authors have experienced good and bad lecturers and effective and ineffective discussion courses. In seeking ways to effectively present the technical subject matter in our courses, we find ourselves employing a variety of techniques and styles. Additionally, the success of discussions and seminars depend heavily on the preparedness of the student as well as the instructor. The effectiveness of a particular class style, then, would be dependent on the style itself, the student, the suitability of the material for presentation using that style, and the expertise of the instructor with both the material and the style. We suspect that these are all closely linked and a truly in-depth study would have to have some mechanism for evaluating these interactions.

Questions 6 and 7 asked students to consider both the highly effective and highly ineffective courses they have had and to indicate the source of the effectiveness or ineffectiveness from the options given. These options were format/style, instructor/ subject matter or both. The responses to both questions were extremely similar. In highly effective courses, 55 percent of the students credited the instructor/subject matter for the effectiveness, 17 percent credited the format/style, and 31 percent said both. In highly ineffective courses, 60 percent of the students blamed the instructor/subject matter for the ineffectiveness, 18 percent blamed the format/style and 22 percent blamed both.

The reported importance of the instructor and material on course effectiveness is consistent with the results observed for Questions 1 and 2. The lesser importance attached to format and style is consistent with the responses to Question 5.

The last three questions provided some demographic information. As expected, the majority of students were either forestry or natural resource majors. Despite the fact that one of the courses surveyed was a freshmen level course, very few of the students responding were freshman (Question 9). Several explanations for this exist. The freshman level course is open to anyone and is linked with the University's general requirements. It therefore attracts a wide diversity of students. Secondly, a significant number of forestry majors do not begin as freshman. Many transfer from community colleges or other programs and are classified as juniors and seniors (based on credit hours) even while taking freshman and sophomore forestry courses. This also helps explain Question 10, which indicates that the majority of students have "C" or better averages. Students who fall below this point are dropped. Since most of the respondents are upper division students, they have already crossed this academic hurdle.

CONCLUSIONS

Despite the increasing emphasis on pedagogy and methodology, instructor attitude, enthusiasm, and organization and subject matter are still the most important factors in determining the student's perception of the effectiveness or ineffectiveness of a course. Course format and style, while not trivial, are rated by students as far less important to their ability to effectively learn. What was clearly important was students' desire to get hands-on experience while in college. Similarly, technology is important and has its place, but also has its limitations in enhancing learning. Most students in this survey felt that it made learning somewhat easier. Traditional methods can and do still work.

This study took place in only one department, and a technical professional program at that. If the results observed here are true of students across the University of Kentucky as a whole, then there are some implications for strategies to improve undergraduate education. Technology should be incorporated to the degree necessary to convey current material and, once incorporated, should be readily accessible to students. The major emphasis should be place on recruiting and rewarding capable instructors dedicated to their profession and the welfare of students. The fact that student's mentioned instructor attitude, much more frequently than perceived instructor competence, in the survey may mean that the greatest crisis in higher education may be how we treat our students. Perhaps it is time to reexamine the original mission of the Land Grant College.

A final caveat in interpreting these results is worth mentioning. The survey dealt entirely with student perceptions of what was an effective or ineffective instructor, course style, or technology. The obvious limitation is that students seldom have a clear idea of what they need to know. They may rate an instructor or course as ineffective because it truly was ineffective or because they did not care for the instructor, did not care for the material, or were unwilling to work with sufficient diligence. This survey was not designed to filter any of this out. Perhaps a better test would be to survey graduates who have been on the job 3 - 5 years as to what constituted effective learning experiences and compare it to the results of this survey. This, too, is a topic for further investigation.

Table 1. Survey issued with response summaries in bold text.

Education in Natural Resources Survey

Students: This survey of your classroom experiences is NOT part of your evaluation for the course you are currently attending. Please be assured that all answers will be held in confidence and your identity will remain anonymous. Please answer these questions based on the entirety of your university experience from all the courses you have taken. When you have finished the survey, fold it in half and return it to the instructor. We appreciate your time and careful consideration of these questions.

1. Please list three things that make a course an excellent learning experience for you. (n=118)

Instructor attitude/enthusiasm 14.8%
Interesting material/subject matter 13.6%
Hands on learning/field work 10.1%
Instructor explains material/available outside class 8.3%
Relevant to real world 7.7%

2. Please list three things that reduce or diminish the effectiveness of learning in a course. (n=114)

Unorganized 15.9%
Early or late classes 13.6%
Instructor attitude 10.0%
Too much work 8.0%
Too complex work 7.6%

3. What kinds of technology have been used by instructors of classes you have had in the past?
(Check all that apply). **(n=118)**

PC labs **(82)**
Multimedia presentations **(58)**
Internet or WWW **(87)**
Commercial software **(27)**
Electronic mail **(83)**
Educational software **(52)**
Online library reference services **(38)**
Other **(12)** (please list) **Laser survey gun, GPS, GIS, electronic homework**

4. Has the use of that technology, in your opinion, made it easier or more difficult to learn new material? (Please circle one)

14 **62** **29** **8** **4**

Much easier/ Somewhat easier/ Neither / Somewhat more difficult/More difficult

Mean = 2.368 Std. Dev. = 0.906 N = 117

5. Please evaluate each of the class styles below for their general effectiveness in helping you learn new material

Course type	HE	E	N	IE	HIE	NO
Lecture	13	78	17	6	3	1
Lab	45	49	12	2	0	8
Discussion/Recitation	30	58	19	4	1	2
Independent/Individual Study	24	27	29	7	0	8
Internships	41	17	10	2	0	43
Seminar	7	29	29	7	2	39

HE--Highly Effective E--Effective N--Neutral I--Ineffective
HIE--Highly Ineffective NO--No opinion

6. For classes you have had that you consider highly **effective**, was the effectiveness due to the course format and/or style or was it primarily due to the instructor and/or subject matter?

Format/Style	**19**
Instructor/Subject Matter	**61**
Both	**31**

7. For classes you have had that you considered highly **ineffective**, was the effectiveness due to the course format and/ or style or was it primarily due to the instructor and/or subject matter?

Format/Style	**17**
Instructor/Subject Matter	**58**
Both	**21**

8. Please circle your major:

FORESTRY **(61)** NAT RES **(17)** AG **(5)** OTHER **(35)**

9. Are you a (circle one):

FRESHMAN SOPHOMORE JUNIOR SENIOR GRAD
(14) **(21)** **(35)** **(44)** **(3)**

10. Please circle the range which corresponds to your GPA:

0.0 - 0.9 / 1.0 - 1.9 / 2.0 - 2.5 / 2.6 - 3.0 / 3.1 - 3..5 / 3.6 - 4.0
(0) **(1)** **(13)** **(50)** **(31)** **(20)**