The Effects of Guided Notes on Undergraduate Students' Recording of Lecture Content

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Notetaking is important for recording and remembering class content in most university courses. Despite the importance of this behavior, however, students are often poor notetakers. This study compared undergraduates' notes after traditional lecture, lecture with slides, and lecture with slides plus guided notes. Data on the percentages of critical points and examples, as well as number of extra points, which were recorded in student notes were collected for each set of student notes produced in each condition. Results indicated using slides with or without guided notes was superior to traditional lecture with regard to critical points and examples. However, improvements in note quality across all dependent measures were observed when guided notes were used.

Despite the importance of quality notes as an aid to academic success, university students are notoriously poor notetakers who often fail to record even half of the critical points from a lecture (Baker & Lombardi, 1985). Though students' deficiencies might be the result of ineffective or nonexistent training in notetaking behavior, another plausible explanation is that the classroom environment does not consistently prompt the behaviors necessary to produce a complete and accurate set of notes. Some researchers have advocated the use of guided notes (e.g., Barbetta & Skaruppa, 1995) to ameliorate the latter problem. Guided notes are modified versions of the instructor's notes or slides that require students to fill in missing information as the lecture progresses. These notes give specific prompts as to when and where students should record key points from a lecture, thus providing an effective antecedent for evoking desired behavior.

Published research on guided notes has focused primarily on the effects of guided notes on students' recall of information as measured by tests and quizzes. The effects of guided notes on academic behavior have been demonstrated convincingly in several studies. For example, Hamilton, Selbert, Gardner, and Talbert-Johnson (2000) found that using guided notes during whole-group instruction improved academic performance of incarcerated juveniles (ages 13-18) in a detention center. Similarly, Lazarus (1991, 1993) found that the achievement of high school students with learning disabilities was higher when guided notes were used. Lazarus (1993) also demonstrated that guided notes were beneficial in increasing academic achievement of college-level students with learning disabilities. Austin, Lee, Thibeault, Carr, & Bailey, (2002) examined the effects of guided notes on undergraduate Psychology students' responding and recall of information and found that the use of guided notes increased the number of prompts given by the instructor and thus the number of verbal responses by the students. The latter studies are particularly interesting because they used post-secondary students as participants, a group that has not been included in guided notes research frequently.

To date, only one study has assessed the effects on guided notes on the quality of the notes taken. Sweeney, Ehrlhardt, Gardner,
Jones, Greenfield, and Fribley (1999) compared the notes taken by developmentally disabled or limited English proficiency (LEP) high school students with and without the use of guided notes. Results indicated that students correctly recorded more concepts and got better quiz scores during guided notes conditions than when they took their own notes, despite the fact that visual aids (i.e., overhead transparencies) were used in both conditions. This finding is interesting in light of previous research on the impact of visual aids on accuracy of notetaking. For example, Locke (1977) concluded that students recorded a greater percentage of critical points from a lecture when points were written on the blackboard as opposed to being presented by spoken word alone. The results of Sweeney et al. suggest that notetaking skills may be further enhanced by the addition of guided notes.

Although Sweeney et al. (1999) examined whether students recorded critical points presented in the lecture, they did not assess whether information other than the critical points was included in the students' notes. This might have been because of the factual nature of the topic (history), which might not have produced many examples or elaboration of ideas during the lecture. However, information other than key points (e.g., examples given in class, elaboration of key points) is often important for learning content, especially when that content is of an applied nature. The current study sought to extend the guided notes literature by examining the effects of three instructional conditions (i.e., traditional lecture, lecture with slides, and lecture with slides plus guided notes) on three different content areas of student notes (i.e., critical points, examples, and elaborations) within the context of an undergraduate applied psychology class.

Method

Participants and Setting

Twenty-three undergraduates in an applied psychology class at a large southeastern university served as participants in the study. The class met twice weekly for 75 minutes. Students were not aware that they were participating in a research study until the end of the semester, at which time each participant gave informed consent to have the information collected from his or her notes used as data in the study. The university's Institutional Review Board approved all procedures.

Dependent Variables and Observation Procedures

There were three dependent measures in the study. Percentage of critical points provided an index of the percentage of major and supporting points presented in the lecture that were included in the students' notes. Each lecture was prepared in advance and subsequently given to two trained research assistants for scoring according to pre-established criteria for identifying critical points. A critical point was defined as any stand-alone statement related to the lecture topic that had not been previously explained during the present lecture or a previous lecture. Although each critical point represented a unique idea, information did not necessarily need to be presented as a complete sentence in order to be scored as a critical point. Research assistants independently counted the number of critical points in each lecture designated for data collection and then compared scores. Interobserver agreement (IOA) for determining the total number of critical points included in each lecture was calculated by dividing agreements by agreements plus disagreements and multiplying by 100%. IOA on identification of critical points in each lecture (which was later used as the standard for scoring student notes) was 100%. The research assistants also attended all lectures designated for data collection to ensure that all critical points identified in the written lectures were presented in class. The instructor delivered 100% of the critical points delineated in the lectures for each of the class sessions. Student notes
were scored for inclusion of critical points by comparing each student’s record to the list of critical points established by the observers and then calculating a percentage (number of critical points recorded / total number of critical points).

Percentage of examples provided an indication of the number of in-class examples that were recorded in the students’ notes. At least one trained research assistant attended each class session designated for data collection and recorded every example given during the lecture by either the instructor or a student. Examples were defined as any statement or set of statements that illustrated a particular concept. A second trained observer attended two of the three class sessions and independently recorded the examples. The lists generated by each observer were then scored for IOA by dividing agreements by agreements plus disagreements and multiplying by 100%. IOA for the lists of examples was 92%. Student notes were scored on this variable by comparing each student’s record to the shorter list of examples (or the list recorded by the primary observer, if the lists were identical), and then calculating a percentage (number of examples recorded / total number of examples).

Extra points provided an indication of the number of supporting statements students recorded that did not meet the criteria for a critical point or example. Extra points were defined as any supporting statement related to lecture content that had not been scored as a critical point or example. The number of extra points was tallied for each set of student notes to provide a measure of this variable.

At the end of each lecture designated for data collection, student notes were collected and subsequently photocopied so that the originals could be returned during the next class session. Students were informed at the beginning of the semester that their notes would be periodically collected in order for the instructor to assess how well she was presenting the material in class.

Interobserver Agreement

One third of the student notes were scored by a second trained observer. Interobserver agreement for each dependent variable was assessed by dividing agreements by agreements plus disagreements and multiplying by 100%. Interobserver agreement for critical points averaged 99%, interobserver agreement for examples averaged 94%, and interobserver agreement for extra points averaged 86%.

Experimental Conditions

There were three experimental conditions in the study. In the traditional lecture condition, the instructor presented material without using slides or any other type of notetaking supplement. The instructor began the class by telling the students she did not have slides for the present lecture but she would be happy to repeat information if a student requested her to do so. Although some students expressed displeasure at the lack of visual aids, no student asked additional questions about why slides were not prepared. In the slides condition, the instructor supplemented the lecture by presenting critical points on slides. Information on the slides was revealed sequentially as the information was discussed to prevent students’ writing from interfering with listening to the lecture or discussion. In the slides plus guided notes condition, the instructor supplemented the lecture with slides containing critical points in the same manner as in the previous condition. However, students were also given note-taking handouts that were essentially copies of the slides with parts missing. To complete the notes, students had to copy short phrases or sentences. The handouts were designed so that students were required to write information to complete each critical point (i.e., none of the information included in the guided notes was sufficient to be counted as a critical point without a written response from the student).
At the beginning of the lecture, the instructor distributed a packet of notes to each student and informed them they would need to fill in the missing information as the lecture progressed. No rationale was given for why the guided notes were distributed and no additional instructions were provided.

Each lecture format was used several times throughout the semester. Format for lectures was determined by randomly assigning each lecture in the course to one of the three formats. However, only three lectures (one from each condition) were selected for data collection due to the inconvenience imposed on students by keeping their notes for 2-5 days, depending on which class day the notes were collected (i.e., Tuesday or Thursday). Although no exams or quizzes were scheduled to occur on a day immediately following data collection, collection of notes precluded students from reviewing their notes in advance preparation for course assessments or to immediately confirm their understanding of the information presented on a class day when notes were collected.

The lectures selected for data collection contained approximately the same number of critical points and were subjectively rated as similar in level of difficulty by two independent observers. Prior to data collection, the instructor for the class and another instructor who had taught the same class during a previous semester using the same text subjectively and independently scored the content of every lecture topic used in the course in terms of difficulty. Lecture material was rated as easy, moderate, or difficult by both instructors. Criteria for ratings were based on previous experience with presenting the material and assessment of student learning. Interobserver agreement for lecture material difficulty was 100% (agreements divided by agreements plus disagreements multiplied by 100%). All lectures rated as moderate in difficulty were scored for number of critical points, and one from each condition was selected for data analysis based on similarities among lectures with regard to the total number of critical points.

Results

Figure 1 shows the means for each dependent variable across lecture formats. With regard to recorded critical points, students included an average of 62% in the traditional lecture condition, 97% in the slides condition, and 100% in the slides plus guided notes condition. For examples, students recorded...
an average of 13% in the traditional lecture condition, 26% in the slides condition, and 60% in the slides plus guided notes condition. For extra points, students recorded an average of 9 points in the traditional lecture condition, 7 in the slides condition, and 29 in the slides plus guided notes condition. Because the dependent variables differed with regard to measurement (i.e., critical points and examples were measured as percentages and extra points were expressed as a frequency), a repeated measures ANOVA was conducted to test the effects of lecture format on each dependent variable. Analyses revealed significant effects of lecture format for each dependent variable (for critical points, $F(2, 21) = 232.75, p < .0001$; for examples, $F(2, 21) = 49.36, p < .0001$; for extra points, $F(2, 21) = 51.15, p < .0001$). Follow-up paired-sample t-tests were performed for each of the dependent variables to contrast the three lecture formats. All individual pair-wise comparisons were statistically significant at $p \leq .03$ (for critical points, $p$ ranged from $.0001$ to $.006$; for examples, $p$ ranged from $.0001$ to $.004$; for extra points, $p$ ranged from $.0001$ to $.032$). For every dependent variable, the guided notes lecture was significantly higher than each of the other formats. Traditional lecture was significantly lower than the other formats for both critical points and examples, but was significantly higher than lecture with slides with regard to extra points.

Discussion
The results of this study revealed that the use of slides in a university class significantly increased the number of critical points and examples recorded in the participants' notes during class lectures. Higher scores across all dependent measures were observed when the students were provided with guided notes. These findings suggest that the traditional approach to lecturing falls short of other lecture presentation methods with regard to prompting good notetaking behavior. Consistent with earlier findings (Baker & Lombardi, 1985; Hartley & Cameron, 1967; Hartley & Marshall, 1974), the present study demonstrated that when students are left to their own devices they do not do a very good job of recording the content of a lecture. It is clear that the use of visual aids (i.e., slides) significantly increased the percentage of critical points and examples recorded in students' notes. However, it appears that if instructors want students to record critical points as well as other important information from a class, guided notes offer an efficient and effective solution.

There appear to be several benefits to improving the notetaking behaviors of post-secondary students. To the extent that the end-product of student notetaking is important for success in passing tests and remembering information, students need to take notes as accurately and completely as possible. It is reasonable to conclude that students' behavioral deficits with regard to notetaking could be the result of a lack of formal training in notetaking strategies (Palmatier & Bennett, 1974). Because it is unlikely most university instructors have the time or inclination to teach notetaking skills, students often are left with very few options for improving their notetaking behaviors. The use of slides or slides plus guided notes offers an efficient alternative to formal training in notetaking by arranging environmental prompts for appropriate behavior.

A second implication of improved notetaking concerns the usefulness of student notes in prompting application of material. For some topics, being able to apply information is just as important as being able to recall facts and definitions. Examples and elaborative information often are crucial to students' understanding of the material and their ability to apply that information to novel settings. In a typical lecture, some examples might be prepared by the teacher and included in a visual prompt, whereas other examples or elaborations of material occur spontaneously as a result of student questions or the teachers'
assessment of the students’ understanding of the material. Without the visual prompt, this important information might be excluded from the students’ notes. To the extent that the use of examples helps demonstrate the application of concepts, students who record examples in class may presumably have a stronger foundation for thinking about how to apply information. Because the use of guided notes in combination with visual aids may significantly increase the number of examples that a student includes in his or her notes, using guided notes could potentially affect the ease with which a student applies concepts learned in class. Further research might seek to validate this assumption.

One limitation of this study is that notes from only one lecture in each experimental condition were analyzed. Though procedures were used to ensure that the three lectures were comparable in length, amount of content, and difficulty, more convincing results could be obtained by taking repeated measures of behavior across each of the lecture formats. This would also allow for a meaningful analysis of individual student data. We chose to analyze data for only one lecture in each condition to minimize inconvenience to the participants. This study might best be viewed as a preliminary study of variables that have yet to be adequately explored in the literature.

The order in which the lectures were selected for analysis also might be considered a methodological shortcoming. Although all lecture formats were presented several times throughout the semester, three lectures were selected for analysis based on similarities in amount and difficulty of content. It just so happened that when the lectures were selected, the lecture analyzed in the traditional condition occurred first, the slides lecture occurred second, and the guided notes lecture occurred third. Therefore, one might argue that notetaking behavior improved due to students’ experience in the class (and potential feedback from exams) rather than as a result of the experimental manipulations. While this conclusion cannot be ruled out entirely, it does not seem likely that the sequence of analysis accounted for the results. Specifically, the participants in the study were junior and senior level undergraduates, who were likely to have well-established notetaking repertoires that would not be easily changed simply by exposure to content across the semester.

Another potential limitation is that the study did not show that the improved notetaking behaviors resulted in corresponding increases in learning for the participants. However, when Nye, Crooks, Powley, and Tripp (1984) examined college students’ notes across various lectures, they concluded that three variables were significantly positively correlated with course exam scores: total number of words included in the notes, average number of words written per lecture, and percentage of words added after the lecture. Their findings suggest that copious notetakers tend to achieve higher exam scores than their less prolific peers. More recently, Williams & Eggert (2002) found that the strongest predictor of exam performance was accuracy of lecture notes. These findings, combined with findings from various other studies that demonstrated improved test and exam scores when guided notes were used (e.g., Hamilton et al., 2000; Lazarus 1991, 1993) suggest it is reasonable to conclude that improvements in the behavior of this study’s participants also would have positive effects on their achievement.

References


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