INTRODUCTION

For nearly two decades, a paradigm shift has been taking place in American higher education (Barr & Tagg, 1995). The shift is in the way educational institutions view their reason for existing. Previously, colleges and universities saw their mission as providing quality instruction. Now, however, these institutions are accepting the fact that their responsibility is to produce quality learning. In the old paradigm, termed “Instruction Paradigm” by Barr and Tagg (1995), institutions saw instruction as an end in itself, whereas more recently, in the “Learning Paradigm,” they are seeing it as simply a means to an end. As Barr and Tagg (1995) note, the shift “ends the lecture’s privileged position, honoring in its place whatever approaches serve best to prompt learning of particular knowledge by particular students” (p. 14). Realizing this shift is crucial to understanding why researchers and educators have spent so much time and effort looking for ways to aid student learning.

One such means to facilitate student learning is guided notes. Although research concerning the benefits of guided notes has existed since the 1970s, their use has not been widely implemented. One possible reason for this is because this innovation has been applied within a system that is built on the Instruction Paradigm which holds that if students have a problem, such as note taking, then the solution is to make students take a class on note taking. Unfortunately, this approach to assist student learning is not effective (Barr & Tagg, 1995). Instead of dealing with the root problem, most Instruction Paradigm solutions simply try to improve the method of instruction (i.e. the lecture); adding newer ways of presenting material.

No doubt, the influx of new technology into the classroom has made it possible to present information in a more dynamic, efficient, and visually pleasing manner than was possible with chalkboards, overhead transparencies, or slide projectors (Weatherly et al., 2002). However, these advancements have had some negative consequences. The most notable is that instructors are able to present more information during the same class period than was possible before the use of technological advancements. Though this would seem to be beneficial to both the students and instructors alike, it does have the potential to be detrimental to student learning. The reason for this is clear: throughout each lecture, students are expected to perform several tasks simultaneously such as (a) listen to the information being presented (b) distinguish and write down key terms and concepts (c) request clarification when necessary (d) answer the instructor’s questions, and (e) contribute original remarks and ideas (Barbetta & Skaruppa, 1995). Of these tasks, listening is arguably the most important, followed closely by note taking. Note taking
serves as the most obvious means by which students can focus their attention, organize ideas, and connect presented material to existing knowledge, thereby enabling learning (Peper & Mayer, 1986). Yet, balancing these two tasks is an extremely difficult mission for most students, especially in classes that contain new and technical vocabulary, and thus, students are forced to choose between note taking and listening.

With the amount of material covered in many classes today, the results are that some students take few, if any, notes during the presentation, in an attempt to hear all the instructor has to say, thus lacking any way to review what was presented. Others frantically try to write down nearly all the instructor says, thereby limiting their participation in class (Hartley & Davies, 1978). Of course these are the extreme cases and research has shown that 99% of college students state that they take notes during lectures, while a similar percentage perceives note taking to be essential to their success (Palmatier & Bennett, 1974). Although students realize the importance of taking notes, research has shown that when students do take notes, they may be incomplete or inaccurate, typically recording 50% or less of the important ideas presented during the lecture (Kiewra, 1985).

Responding to these trends, researchers have searched for ways to improve students’ note-taking and listening abilities simultaneously. One means for accomplishing this is to provide students with handouts. There are several types of handouts that instructors can use. One type would be the instructor’s notes, literally all the notes used by the instructor to make the lecture. Another would be the slides used in the presentation, which may or may not have additional notes. Still another would be an outline to the lecture without any additional material. Yet, research has shown that at best these type of notes are of little value or benefit, and at worst, they can have a negative effect on student learning (Weatherly et al., 2002; Barnett, 2003).

There is another type of handout that has been shown to have a positive impact on aiding student learning: guided notes. As described by Barbetta and Skaruppa (1995), guided notes are “handouts that guide students through a lecture by providing a format that includes basic background information with standard cues and space for students to write the key points” (p. 156). By providing students with a resource that prompts them to write key points during the lecture, guided notes serve many positive purposes such as (a) helping students organize lecture material (b) providing students opportunities to actively participate in class and (c) paying more attention to the instructor during the lecture (Heward, 1994), all of which positively affects academic success.

Several studies suggest that providing students with guided notes improves both the quality of notes taken (Kiewra et al., 1988) and students’ performance on examinations (Austin et al., 2002, 2004; Cornelius & Owen-DeSchryver 2008). For example, Austin et al., (2004) found that using guided notes in undergraduate level courses improved the quality of information recorded during class lectures compared with students who were left to take their own notes. Students that were given guided notes consistently increased the number of critical points
recorded throughout the presentation. Moreover, Austin et al., (2002) found that students using guided notes had higher mean quiz scores than those who used traditional note-taking methods, suggesting guided notes improved the immediate recall of information.

This study sought to examine the effectiveness of supplying guided notes to undergraduate students in a geography class. First, the study examined the contention that guided notes will improve students’ performance on examinations and second, the study assessed students’ opinions about the benefits and usefulness of guided notes suggested by previous research (Austin et al., 2002; Barbetta & Skaruppa, 1994; Murphy & Cross, 2002). Finally, this study evaluated students’ perceptions about the benefits associated with guided notes suggested by the study conducted by Barbetta and Skaruppa. A comparison was made between two separate, but successive semesters. Classes were nearly identical, with the major exception being that students in the first semester were not given guided notes during the first examination section, whereas students in the second semester were.

METHOD

Participants

One-hundred and thirty-two students (64 in the fall term and 68 in the spring term) enrolled in Physical Geography participated in the study. The mostly male sample was composed of mainly sophomores (with a small number of freshmen) taking their first and only geography class.

Materials

Physical Geography, also known as EV203 or colloquially as “Dirt,” is a 17-week, 40-lesson course dealing with introductory principles and processes of earth science, meteorology, climatology, geomorphology, and environmental systems, as well as an introduction to cultural geography. The class enrollment consistently numbers well over 500 students per semester and is taught by an average of 10 instructors, thereby enabling the class size to be at 18 or less. EV203 is a 200-level core course, meaning that it is a graduation requirement for all academy students, with the majority of students being sophomores, although occasionally freshman will be enrolled as well.

Classes are 55-minute in length and meet every 1-day during C and D Hours (0950-1045 and 1100-1155 respectively) and every 2-day during G and H Hours (0730-0825 and 0840-0935 respectively). The class covers 18 chapters in the physical geography textbook and six chapters from the human geography textbook. A Student Study Guide is also required for the class and contains homework questions, reading assignments, and numerous vignettes. The course is divided into four examination sections, with the first two sections covering a certain number of chapters from the physical geography textbook and the third section covering chapters from the human geography textbook. The final section is a review and discusses the format of the term-
end exam (TEE) which is a cumulative test. After each section, students took a written partial review (WPR) that covered material in that section of the course. The WPRs cover the information presented in each section and is not cumulative. These exams consist of multiple-choice and short answer questions and are given during the 55 minute class period. The short answer questions require students to employ skills beyond simple recall, such as the application of general concepts.

Lessons are taught using multiple techniques throughout the semester, but mainly consist of an oral presentation given by the instructor accompanied by a PowerPoint presentation (other techniques include student presentations, board work, in-class practical exercises, educational videos, and guest lecturers). The presentations are created by a subject-matter-expert (SME) within each of the sub-courses within the course (e.g. climatology, meteorology, geomorphology, or the culture classes), but are modified by each individual instructor. Each of the slide shows consist of approximately 30 to 35 slides and cover the material students are required to understand from each lesson. The presentations are a mixture of graphs, pictures, diagrams, and text. Material on each slide is provided in bullet format to highlight the lessons’ important points. Slides are not considered to be comprehensive notes, but rather an outline.

Finally, at the beginning of the semester, students enrolled in the course are provided with a course guide/syllabus stating the goals and outcomes of the course as well as all the requirements for the class (e.g. which textbooks to buy, expectations for classroom behavior, methods for documentation on graded events). A calendar is provided that includes the topics to be discussed in class, dates topics will be covered, homework assignments, and dates exams will be given.

The comparison of the two courses was similar in every way, except that one course was in the fall and one in the spring. For both classes, the instructor used PowerPoint presentations that contained the exact same content for each lesson. Both courses utilized the same text books and study guide, and the courses were taught during the same hours of the day. Finally, student performance was measured using exams that consisted of exactly identical multiple choice and short answer questions.

**Procedures**

The fall semester examined during this study was the instructor’s first semester teaching students. Being new to the craft of instruction, during the first examination section I simply taught the material and allowed students to take their own notes. However, after the first WPR, it quickly became apparent that students were not really grasping the material. It was my belief that the reason for this was due to their inability to organize the material; since Physical Geography is best known for the wealth of material covered. In fact, a common expression for the course is that “Dirt might only be an inch deep, but it is a mile wide.” After conducting a sensing session with every one of my four sections, I wanted to design a tool that students could use to better
arrange the most important concepts from each of the lessons. Since we do not provide our
PowerPoint slides to the students, as a matter of department policy, I figured the next best thing
would be a tool that would help students follow along in class, spend more time focusing on the lecture, and would improve their review prior to exams. I thought I could help my students by providing a handout that was only partially complete—a guided notes page. Unfortunately, I did not think about this type of resources until after the first WPR.
Figure 1. Front side of guided notes page for Lesson 21, Internal Processes.
### Types of Volcanoes

<table>
<thead>
<tr>
<th>Name</th>
<th>Shape &amp; Size</th>
<th>Magma (Felsic or Mafic; Viscosity, explosivity)</th>
<th>Examples...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lava Dome or Plug Dome</td>
<td>Highly viscous, high silica content, too thick and pasty to flow very far.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cinder Cones</td>
<td>Cone shaped, smallest of the volcanic peaks, very steep peaks.</td>
<td>Mafic/Basalt magma most common</td>
<td></td>
</tr>
</tbody>
</table>

### Diastrophism:

**Folding:** Identify the anticline and syncline in this graphic:

- **Force:**
- **Associated Landform:**

### Faulting (DRAW):

<table>
<thead>
<tr>
<th>Normal Fault</th>
<th>Reverse Fault</th>
<th>Strike Slip Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force:</td>
<td>Force:</td>
<td>Force:</td>
</tr>
<tr>
<td>Associated Landforms:</td>
<td>Associated Landforms:</td>
<td>Associated Landforms:</td>
</tr>
</tbody>
</table>

### Engineering Design: Earthquake Hazards (see slides on Blackboard)

- Where are earthquakes most common?
- Most damage during an earthquake is caused by...?
- Structures built on what kinds of soil are the most susceptible to damage from earthquakes?
Therefore, students in the first semester were not given guided notes pages during the first examination block, but were given guided notes during the last three blocks. However, the students in the second semester were given guided notes for all blocks. For both groups, guided notes were given at the beginning of each class for students to use during the lecture and were not provided prior to the lecture.

My guided notes included significant figures or graphs from the text book (see Figure 1 and 2). They followed the lecture material exactly and were kept to two pages in length; some were shorter, but none were longer. Important background material was included with blank spaces for students to write in key terms and definitions. Each of the guided notes followed a similar design thereby allowing the students to become familiar with the structure of the tool itself, with the hopes that they would increase students’ opportunities to listen and actively participate in the lecture.

To evaluate students’ perception of the guided notes page, a questionnaire was used that asked students to provide both qualitative and quantitative answers regarding their perspective toward guided notes. Following Austin et al., (2002), I asked students several questions regarding the usefulness of guided notes (see Table 3), to determine the perceived effectiveness of using guided notes. Questions asked students to provide feedback in the form of short answers and responses using a 5-point scale (e.g. whether guided notes helped them to pay attention more in class, prepare for exams, and improve their performance on major graded events). The questionnaire also assessed the students’ preference of using guided notes over their own note-taking habits, whether they would recommend using guided notes to their friends who were not using guided notes, and whether guided notes should be used in the future.

Results

Tables 1 and 2 present the compiled data for Terms 11-1 (Fall Semester) and 11-2 (Spring Semester) respectively. Each of my four sections is listed separately with the total average for that section given in the far right column. The total averages for each major graded exam is listed in the row with “Total.” For example, for WPR 1 the average for all four of my sections is 76.44%. In the last row I have “All Sections” listed. This is to compare my sections’ total score with that from the rest of the students enrolled in the course.

Figure 3 presents the average score by students in my four sections across the four major exams (WPRs 1, 2, 3, and the TEE) for each semester (this is the same information in graphic form as is presented in Tables 1 and 2). The graph in Figure 3 shows four columns for each major exam comparing my score from Term 11-1, 11-2, and the average scores for all sections (minus mine) for each term. The black columns represent my students’ scores from Term 11-1 (those without guided notes pages prior to WPR 1). The light gray columns represent all students’ scores from Term 11-1 enrolled in EV203.
The white columns represent my students’ scores from Term 11-2 (those with guided notes pages prior to WPR 1). The dark gray columns represent scores from the rest of the students enrolled in EV203 for Term 11-2.

Table 1. Data from Term 11-1 for all major exams.

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Section</th>
<th>WPR 1</th>
<th>WPR 2</th>
<th>WPR 3</th>
<th>TEE</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>C</td>
<td>71.19</td>
<td>81.24</td>
<td>79.36</td>
<td>78.86</td>
<td>77.66</td>
</tr>
<tr>
<td>15</td>
<td>D</td>
<td>77.16</td>
<td>79.33</td>
<td>79.13</td>
<td>76.21</td>
<td>77.96</td>
</tr>
<tr>
<td>18</td>
<td>G</td>
<td>80.96</td>
<td>83.04</td>
<td>87.61</td>
<td>81.89</td>
<td>83.38</td>
</tr>
<tr>
<td>17</td>
<td>H</td>
<td>76.47</td>
<td>79.80</td>
<td>81.00</td>
<td>80.80</td>
<td>79.52</td>
</tr>
<tr>
<td>64</td>
<td>Total</td>
<td>76.74</td>
<td>80.92</td>
<td>82.06</td>
<td>79.61</td>
<td>79.83</td>
</tr>
<tr>
<td>528</td>
<td>All Sections</td>
<td>77.01</td>
<td>80.16</td>
<td>83.66</td>
<td>80.57</td>
<td>80.35</td>
</tr>
</tbody>
</table>

Table 2. Data from Term 11-2 for all major exams.

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Section</th>
<th>WPR 1</th>
<th>WPR 2</th>
<th>WPR 3</th>
<th>TEE</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>C</td>
<td>80.75</td>
<td>88.82</td>
<td>80.88</td>
<td>81.41</td>
<td>82.97</td>
</tr>
<tr>
<td>16</td>
<td>D</td>
<td>79.79</td>
<td>81.83</td>
<td>79.06</td>
<td>81.18</td>
<td>80.47</td>
</tr>
<tr>
<td>19</td>
<td>G</td>
<td>73.44</td>
<td>80.70</td>
<td>81.11</td>
<td>79.45</td>
<td>78.67</td>
</tr>
<tr>
<td>16</td>
<td>H</td>
<td>75.21</td>
<td>84.25</td>
<td>81.50</td>
<td>79.50</td>
<td>80.11</td>
</tr>
<tr>
<td>68</td>
<td>Total</td>
<td>77.18</td>
<td>83.83</td>
<td>80.66</td>
<td>80.36</td>
<td>80.51</td>
</tr>
<tr>
<td>460</td>
<td>All Sections</td>
<td>76.06</td>
<td>82.16</td>
<td>84.34</td>
<td>80.90</td>
<td>80.87</td>
</tr>
</tbody>
</table>

The data for my four sections, from Term 11-1 and 11-2, for WPR 1 were analyzed by conducting a t-Test (assuming equal variance) using the test scores of individual students. The result of this test shows that the main effect of using guided notes pages was not significant ($p > .05$). The results demonstrate that the class without access to guided notes pages did as well as those who did have access.

Data for the students’ perceptions regarding the benefits and use of guided notes in the classroom are presented in Table 3. Most notable among these results is the agreement among students that the use of guided notes enabled them to attend better to the lectures. While the percentage was less for students who felt guided notes helped them retain more, the majority would recommend using guided notes in the future.
Comparison of Term 11-1 and 11-2

- Term 11-1
- All Sections Term 11-1
- Term 11-2
- All Sections Term 11-2

![Comparison of Term 11-1 and 11-2](image.png)

**Figure 3. Average score for students in Terms 11-1 and 11-2 for all exams.**

**Discussion**

Guided notes were originally designed during my first semester to give to my students because I thought that such a tool would increase their learning opportunities and thus improve their performance. Improvements could have manifested in several different ways. By supplying an outline that exactly followed the presentation, it was possible that students would spend more time concentrating on the lecture itself than if they had to discern and write the information they felt was the most important. It could have been used to disseminate the information presented in class to those who were, for whatever reason, unable to attend the class(s). Additionally, students could have used the guided notes as a tool to reinforce the class material, thereby improving recall on exams. Despite these possibilities, the use of guided notes was not associated with significant improvements over their absence. This was similar to results obtained by Barnett (2003), who found that students who used guided notes did not significantly increase performance on exams when compared with students who used their own notes.
Table 3. Percentage of students in Terms 11-1 and 11-2 who agreed with the statements presented on an end-of-course survey completed by students prior to the term end exam.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was better able to pay attention to the presentation while using guided notes</td>
<td>82</td>
</tr>
<tr>
<td>2. Guided notes helped me prepare for exams</td>
<td>88</td>
</tr>
<tr>
<td>3. Guided notes helped me retain more information than if I had not used them</td>
<td>73</td>
</tr>
<tr>
<td>4. I preferred using guide notes over taking my own notes</td>
<td>76</td>
</tr>
<tr>
<td>5. I recommend the continued use of guided notes in future classes</td>
<td>94</td>
</tr>
<tr>
<td>6. I would recommend the use of guided notes to a friend who is not using guided notes</td>
<td>94</td>
</tr>
</tbody>
</table>

Since the present study was not a controlled experiment, the lack of improvement between the two terms may be understood by discussing a few flaws in the study’s design. The first is that this is a small sample. Only one WPR was examined between the two semesters, which means that it is impossible to determine if the guided notes helped the students in the second semester improve over time. Another plausible explanation is that those students taking EV203 in the Fall Semester are better performers or are smarter than those in the Spring Semester. However, since students were assigned randomly to each of the two semesters, this is highly unlikely. In fact, looking at the SAT scores of the students across the two semesters, there is little difference between them.

Other factors which may have contributed to the difference in student performance between the two semesters involve the teacher, the exams, the time of day or year the courses were taught, or the classrooms in which the lectures were given. However, for each of these factors, one would expect the scores of the first semester to be lower than those of the second semester. It is very possible that I delivered the lecture in a more efficient and effective manner in the second semester than in the first, but this should have improved the performance of the second group. The material taught was exactly the same and the slide shows used were slightly updated, but still had the same content. Again, one would expect the second semester group to be significantly higher than the first and this is not what we see. The WPRs between the two semesters were identical and therefore can be ruled out. The other factors, time of day and days of the week were nearly identical in both semesters; though there were variances of course due to holidays falling at different times, making the 1-Day/2-Day schedule different across the two semesters, but this is not of significant importance in explaining any differences between the two classes. Finally, I did teach in a different classroom during the second semester. I did not like the classroom I used for the first semester and wanted to move to a slightly larger classroom. If classroom size were a significant in affecting student learning, then students’ scores should be higher in the second semester than, but were not.

One final possible explanation for the lack of improvement between the two classes could be that this tool is only effective for those who are not already using numerous effective performance-enhancing techniques. For example, Lazarus (1993) found that guided notes
improved the performance of high school and college students who had minor learning disabilities. Additionally, Sweeny et al. (1999) found that guided notes helped improve the quiz scores of high school students who were at-risk academically. Finally, Hamilton et al. (2000) found that guided notes helped improve the academic achievements of incarcerated adolescents with learning disabilities. According to these authors, one important difference between those with learning disabilities and those without is their note-taking abilities. Those with learning disabilities are poorer note takers than those without learning disabilities. Given that those who apply to and attend the United States Military Academy have higher-than-average aptitude, it would follow that at least the majority of this population does not have difficulty taking effective notes. Therefore, they would not significantly benefit from a tool designed to improve a skill they already possess.

It is interesting to note that while there was no significant difference in performance between students in the two semesters, the majority felt that guided notes were extremely beneficial to their success in the class. With respect to the in-class benefits, 82% responded that they were better able to pay attention to the presentation while using guided notes and 73% reported that guided notes helped them retain more of the material because they used guided notes. Additionally, 76% preferred using guided notes over taking their own notes, stating that guided notes better organized the material. Regarding the usefulness of guided notes for test preparation, 88% stated that guided notes helped them prepare for exams.

**Conclusion**

Regardless of if student performance is improved using guided notes, an overwhelming majority, 94%, felt that guided notes were so important to their success, that they recommend the continued use in future classes. Moreover, students stated that they would recommend the use of guided notes to their friends who were not using guided notes. Previous studies (Hartley, 1976; Klemm, 1976; Austin et al., 2002) also found similar responses. Although students’ scores did not improve, at least their performance was not negatively affected (i.e. their scores did not suffer as a result of using guided notes). Though we don’t necessarily worry about pleasing the students here at the Academy, this is one teaching method that instructors can use to make students feel as though they are receiving the best possible education.
References


