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Effects of Note Taking on Student Grades

**A Research Project Presented to the Graduate Faculty of the
Department of Occupational and Technical Studies
Old Dominion University**

**In Partial Fulfillment of the Requirements for the
Masters of Science in Occupational and Technical Studies**

By

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SIGNATURE PAGE

Amy Kole Keenan prepared this research project under the direction of Dr. John Ritz in OTED 636, Problems in Occupational and Technical Studies, at Old Dominion University. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the degree of Master of Science in Occupational and Technical Studies.

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CHAPTER I

INTRODUCTION

Higher education students take notes in class in order to receive higher scores on exams. According to Shimota, an academic advisor at the College of St. Benedict and St. John University, there are six reasons why note taking is important. The first reason is that organized notes will help the student identify the core of important ideas in the lecture. Another reason is that notes allow the student to keep a permanent record that helps to learn and remember later. The third reason is that the lecture may contain information not available anywhere else. Next, the lecture is where the student learns what the instructor thinks is important, and the instructor uses them to make the exams. The fifth reason is that class assignments are usually given in the lecture. The last reason for taking notes is the underlying organization and purpose of the lecture becomes clear through note taking (Shimota, 2003).

Note taking can be controlled by the instructor in many ways. The instructor can give the students a copy of the notes that he or she uses for lectures. For example, if the instructor uses PowerPoint as a lecture aid, they can then give the students a copy of the PowerPoint presentation as a note taking guide. The instructor can also give the students a note taking guide to use in order to follow along with the lecture. A note taking guide would follow the lecture order but there would be blanks where important information should be entered. With these materials provided, the student does not have to rigorously copy notes while the instructor lectures. This allows the student to listen and write the important information down. This ability to listen will help the student learn more and therefore directly aid in performing well on exams.

The researcher taught two semesters of OTS 220, The Fashion Industry, at Old Dominion University. The students in each course received both forms of note taking given by the instructor. The goal was to determine if the full set of notes would make a significant difference in grades on the exams.

PROBLEM STATEMENT

The problem of this study was to determine whether notes that were a copy of the entire lecture would affect student performance on exams in OTS 220, The Fashion Industry, at Old Dominion University.

HYPOTHESIS

To guide a solution to this problem, the following hypothesis was established:

H₁: Students in OTS 220, The Fashion Industry, who received a copy of the PowerPoint lectures for a specific unit of instruction from the instructor will earn higher grades on exams than when they received a basic fill in the blank note taking guide.

BACKGROUND AND SIGNIFICANCE

The researcher has been a college student for over six years and is very experienced in taking notes. Every course is different but the similarity is that they all require some form of note taking. Having been exposed to many forms of note taking, the researcher wanted to determine what level or form of note taking would incur the best grades. Determining this information would help college students everywhere improve their academics as well as their note taking skills.

In order to determine this information, the researcher used the course that she taught as a Graduate Assistant at Old Dominion University. The course was titled, OTS 220, The Fashion Industry. This class was taught in the Fall 2003, semester, and in the Spring 2004, semester, by the researcher. Having two sections of this course, the researcher could compare the two courses to determine which level of note taking improved student grades.

According to Michael Kinsman, good note taking will help a student receive higher grades. The way they take notes is also important. Students think that attendance is the key to better grades. Kinsman says that attendance alone is not how students will get better grades. It is very important that they listen and take notes on important information. As long as they are taking notes, then they are listening and understanding (Kinsman, 2003). It is this notion that shows why this study is important. If the student understands the information that is given to them, they can learn and master it. This will in turn improve their performance on exams. With knowledge of the effectiveness of these note taking strategies, other instructors may use the results of this study to improve student learning.

LIMITATIONS

The following limitations were observed during this study:

1. This study was limited to students in OTS 220, The Fashion Industry, at Old Dominion University.
2. The researcher was the instructor of the course OTS 220, The Fashion Industry.
3. The study population was limited to Fall 2003 and Spring 2004 enrollment.

4. Students were a mixture of sophomores, juniors, and seniors.
5. The majority of students were women.
6. The study was performed over two semesters.

ASSUMPTIONS

This study was based upon the following assumptions:

1. Students enrolled in the class were from various colleges within the university.
2. The study population was ethnically diverse.
3. The student's level of abilities varied among the participants.
4. The same instructional materials, assignments, and examinations were used for both groups being studied.
5. Students were enrolled in this course either to take as an elective or to fulfill a requirement as a fashion major.

PROCEDURES

This study applied different forms of note taking to two groups of students taught by the researcher in the course OTS 220, The Fashion Industry, at Old Dominion University. One group was the control group and the other was the experimental group. The control group received a note taking outline with blanks that were to be filled in. The experimental group received a full outline of the notes from the instructor without any blanks.

The instructor chose one specific unit for evaluation. Each group studied the same unit but they were given different note taking guides. The experimental group was

given the full copy of the lecture notes in outline form for this unit via e-mail from the instructor. PowerPoint has the option to send the chapter lecture to Microsoft Word as an outline. This outline includes all of the text but does not include pictures. This form did not have any blanks that needed to be filled in by the student. At the end of the unit, an exam was given and the scores were recorded.

The control group was given lecture notes on the unit of study. The instructor e-mailed the students a different form of notes. For this unit, the students were given a guide but not the complete outline of notes. They had to fill in many blanks. At the end of the unit, the students were evaluated and their scores were recorded.

At the end of the two semesters, the instructor collected the data from the two groups and compared the results to determine if a full lecture note outline of the unit had a significant impact on the grades earned by the students.

DEFINITION OF TERMS

The following terms are defined for the purpose of clarification:

Note taking guide – this is a guide that is created by the instructor that allows the student to follow the lecture and fill in any important information.

OTS 220, The Fashion Industry – this is a course taught at Old Dominion University that is an overview of the fashion industry. It briefly examines many aspects of the fashion industry including types of jobs, history, changes, and advances.

Outline form – this term is used with the PowerPoint program. When the lecture or presentation is printed, the outline form is a choice. This form is the exact text of the presentation, excluding any pictures.

PowerPoint – is a program in the Microsoft Office suite which allows users to create presentations and handouts. By creating PowerPoint “slides,” users can add color, images, sounds, and movies to their text presentations (Catalyst, 2003).

OVERVIEW OF CHAPTERS

This study will determine if extensive note taking guides that were provided by the instructor aided in higher exam performance. The first chapter of this study reviewed several key points. One of these key points was the researcher’s views and beliefs and the reason this study was conducted. It also included the methods and procedures for this study, including the limitations and assumptions that must be acknowledged. This chapter also included a clarification of terminology that was used throughout the study.

The next chapter of this study will include a Review of Literature which the researcher further explained this study. Following the Review of Literature, the methodology and procedures for collecting the data will be presented in Chapter III. After the methods and procedures are presented, the findings will be discussed in Chapter IV. The final chapter will include a summary of the research and the conclusions and recommendations for the use of an extended note taking guide.

CHAPTER II

REVIEW OF LITERATURE

This study's goal was to determine whether a full print out of the PowerPoint lecture notes created an increase in test performance for students taking The Fashion Industry course during the Fall 2003, and Spring 2004, semesters at Old Dominion University. The researcher collected and analyzed grades from both a control and experimental group.

This chapter of the study discusses lecture note taking from PowerPoint and its relation to student's grades. The three areas of focus for this chapter are the two variables involved, taking notes and student grades, and PowerPoint as a lecture aid.

NOTE TAKING

Every student who is enrolled in a college level course should know that taking notes is important. There is a lot of information on taking notes available. Every school or university has their own methods for the note taking process. These methods are very accessible to the student. A simple "google" search of note taking on the web brings up thousands of resources. Most of the resources are web sites from different schools with their version of how to take proper notes.

The most important question is why are notes so important? According to DePaul University, they are important for three reasons. The first reason they are important is that effective and efficient note taking can aid in understanding and recalling material. Another reason is that when a student takes good notes, the student can use them as a study tool. The final reason that note taking is important is that if a student reviews their

notes regularly, studying for an exam will only be a review process, not a learning process. This in turn will result in higher grades on their examinations (DePaul University, 2003).

Although there were many websites with information on taking notes, the academic advising website from the College of Saint Benedict and Saint John's University includes many of the important note taking skills. Note taking is a three step process. The steps are as follows: What to do before the lecture, during the lecture and after the lecture. Before the lecture, students should read the material that will be covered. During the lecture, students should pay attention, listen, and take notes. After the lecture, students should review the notes that they took during class. If they do all of these things, they should perform well on the examination (Shimota, 2003).

This study used two different types of note taking. The first form was a print out of the entire lecture notes given by the instructor. This method was chosen because the student would be able to listen to the lecture rather than take notes the entire time. The second form was a print out of the lecture notes with blanks that were to be filled in by the students. This form did not allow the student to listen to the entire lecture because there were blanks that needed to be filled in and student concentration had to move from listening to writing.

POWERPOINT AS A LECTURE AID

According to the Catalyst glossary from the University of Washington, PowerPoint is defined as "a program in the Microsoft Office suite which allows users to create presentations and handouts. By creating PowerPoint "slides," users can add color,

images, sounds, and movies to their text presentations” (Catalyst, p.12, 2003).

PowerPoint’s use has grown tremendously in the past two to three years. It has replaced the traditionally used color slides and overheads at important conferences. It was originally developed for commercial and business purposes, but it has quickly penetrated the scientific and educational circles. Now, many colleges and universities as well as high schools are using PowerPoint on a regular basis for teaching or lecturing purposes (Szabo & Hastings, 2000).

Currently, there is a limited amount of data available on the evaluation of PowerPoint as a lecture aid. In a wide literature search, three reports were found that related to lecturing with PowerPoint. The first report presents findings from a pilot study that was conducted in the United States. In the study, 161 students who were enrolled in a General Psychology module were tested. The module was offered in two groups. One group ($n=87$) received traditional lectures delivered with overhead transparencies. The other group ($n=64$) received the lectures with the aid of the PowerPoint software. At the end of the semester, the mean grade on all examinations was greater for the PowerPoint group than for the overhead lecture group. The course grades were 81.6% versus 76.9%. The total number of absences were counted and they were less in the former ($n=87$) than in the latter ($n=64$). These findings appear to be promising because they suggest that lectures delivered in electronic format using PowerPoint will increase students’ grades and improve lecture attendance rates (Evans, 1998).

Harknett and Cobane in 1997, provided another account of the efficacy of PowerPoint in lecturing. Eighty percent of the students surveyed by the authors felt that PowerPoint lectures benefited their learning. Some felt that the visual emphasis in

PowerPoint helped them recall the lecture material at the time of examination. However, apart from the students' positive attitude towards this method of lecturing, no other significant benefits of PowerPoint were found. The authors suggest that PowerPoint slides are easy to update and that they can provide excellent opportunity for creating electronic handouts (Harknett & Cobane, 1997).

The third study, regarding PowerPoint in the classroom, to be discussed was done by Lowry in 1999. In this study, three groups of students ($n=130$ in each), enrolled in an Environmental Science course in England, were tested. The first group was studied in 1994/95. They received lectures the traditional way, using overhead transparencies. The second group, studied in 1995/96, and the third group, studied in 1996/97, received lectures with PowerPoint. All students were assessed with a 30 item multiple choice test. The test was not exactly the same for all three groups, but it was of similar content. The results showed that the two PowerPoint groups achieved better grades than the traditional lecture group (Lowry, 1999).

A major benefit of the PowerPoint program is that it has the ability to print notes for the students to follow. When the slide show has been completed by the instructor, it is possible to print the show in several ways. The way to print the slide show as a note taking resource for students is to select Notes then select 3 or more per page, under the Print What section. This option can print three slides per page with space to the right for students to take any additional notes.

Based on the evidence of the three studies reviewed, PowerPoint is an effective lecture aid and helps students perform better on examinations. Because PowerPoint has been proven to be effective, the instructor chose this method of teaching for the

experiment. PowerPoint allows the instructor to create notes based on the lecture. The two different forms of notes available helped to determine which provided the best student results on examinations.

STUDENT GRADES

Student grading began at what is now known as Harvard University. It became the birthplace of student evaluation and grading. The first college examinations in America were concerned with the evaluation of factual performance and the ability of a student about to graduate. These types of exams were the most important and inclusive and were widely used until the idea of more frequent tests of student progress was developed (Smallwood, 1935).

The first recorded marking system was created at Yale University. This initial marking system used descriptive adjectives. Instead of a grade, students received a word. For example, when an exam was given to fifty-eight students, they were separated into four groups. The first group was made up of twenty students who were called "Optimi." The second group, made up of sixteen students, was called, "second Optimi." The third group, made of twelve students, was called, "Inferiores." The last and final group, made up of ten students, was called, "Prejores" (Smallwood, 1935). The use of such adjectives was very subjective and left room for wide variations within each adjective. Later, in 1813, Yale developed the first known scale ever used to report achievement. The scale had a four point range with one being the worst and four being the best. The utilization of this scale was intended to lessen the individual bias that had been apparent in prior years of evaluation using the descriptive words (Smallwood, 1935).

The current grading system's roots can be traced to Mount Holyoke in 1897. Mount Holyoke used three grading systems including descriptive adjectives, percentages and group letters. These three systems had been used separately at several universities and Mount Holyoke combined these three systems and developed a grading system using numbers and letters. This grading system looks like what is seen today in American schools: A=95-100, B=90-94, C=86-89, D=80-84, E=75-79, and F=fail (Smallwood, 1935).

Today, grades primarily have five purposes. Administration is the first reason for grades. The administrative purposes include student matriculation, placement when students transfer from one school to another and student entrance into college. The second and more obvious purpose for grades is to provide feedback about student achievement. The third purpose for grades is to provide guidance to students about future course work. Grades help counselors provide direction for students. They recommend students to courses they should or should not take and schools and occupations they might consider. The fourth purpose is to provide guidance to teachers for instructional planning. Teachers use grades to make decisions about student's strengths and weaknesses in order to group them for instruction. The final purpose of grades is to motivate students. When using grades to motivate students, students are encouraged to try harder both negatively and positively (Marzano, 2000).

The researcher primarily focused on student grades to see which method of note taking would result in the highest grades. Illustrating the five purposes of grades demonstrates the importance of a grading system to students. The researcher chose to

experiment with note taking to develop a researched base method to improve student grades.

SUMMARY

The review of literature focused on three areas: note taking, PowerPoint as a lecture tool, and student grades. From this review, it is apparent that all three are related. PowerPoint was found to be a great support for instruction. With PowerPoint, it is easy for the instructor to create note taking guides. This allows students to listen in class rather than copy the notes that the instructor is going over. If they listen more in class and have better notes, they are more likely to receive higher grades on examinations. Finally, if they perform higher on tests, they are motivated to do well in the future. The cycle continues and learning is achieved.

In Chapter III, the researcher will explain the methods and procedures used to determine if the extensive and full note taking guide provided by the instructor made a significant difference in the grades earned by the students taking The Fashion Industry at Old Dominion University during the Fall 2003 and Spring 2004 semesters.

CHAPTER III

METHODS AND PROCEDURES

Chapter III, Methods and Procedures, of this experiment sought to determine whether notes that were a copy of the entire lecture would affect student performance on exams in OTS 220, The Fashion Industry, at Old Dominion University. This chapter will describe the research methods and statistical procedures used to collect and analyze the data. Included in Chapter III are the population that was studied, research variables, instrument design, classroom procedures, methods of data collection, the statistical analysis, and a summary.

POPULATION

The population for this study was derived from students enrolled in OTS 220, The Fashion Industry, at Old Dominion University during the Fall 2003, and Spring 2004, semesters. University advisors controlled the registration for this course. The Fashion Industry is a requirement for the Bachelor of Science degree in Fashion. Most students are fashion majors, although some students took the class as an elective.

The students were both male and female, although most were female. They were all undergraduate students seeking degrees in Occupational and Technical Studies or other colleges within the university. The classes were made up of sophomores, juniors, and seniors.

There were two separate segments of this course. The Fall 2003, semester consisted of 29 students. The Spring 2004, semester consisted of 29 students. The researcher taught both segments of this course amounting to a total of 58 students.

RESEARCH VARIABLES

There were two variables that were identified for this study. The independent variable was the lecture notes. The dependent variable was the students' grades. For the independent variable, lecture notes, students were given two different forms. These two types included a full outline of the PowerPoint lecture given by the instructor and a fill in the blank note taking version of the lecture notes. The dependent variable, student grades, was taken directly from the students. After the students signed a waiver, the instructor had access to the grades that the students received on the test from unit two.

INSTRUMENT DESIGN

The unit two test scores from the fall and spring semesters were used to obtain the necessary data. It included the students' names and their grades on the unit two test. The grades from each section of the course were compared in order to see if there was a significant difference in performance between the two sections.

CLASSROOM PROCEDURES

At the beginning of each course, the researcher requested that the students participate in this research study. The researcher explained the study to the students and the students had a choice to participate. They also had the choice to drop out of the study at any time without any consequences. Those who chose to participate completed a consent form.

The researcher randomly selected the Fall 2003, section of the course as the control group prior to the beginning of the study. The Spring 2004, semester became the experimental group.

Both classes were provided with a syllabus, schedule, and assignment explanation page. These were the same for both groups. The course was made up of lecture using PowerPoint, group work and discussions, and oral presentations. Students were evaluated on content at various intervals during the semester using tests and written and oral assignments.

One unit of study was selected as the unit to use for the research. The unit was on Chapters 7-13 of the text, The World of Fashion, 2003, by Jay and Ellen Diamond. The researcher taught the chapters with the help of PowerPoint. At the end of the unit, the students were tested on content from Chapters 7-13. The highest possible grade was a 100%.

The instructor used the same PowerPoint lecture for both the control and the experimental group. The control group, the Fall 2003 semester, received a note taking guide with blanks that were to be filled in by the students during the lecture. The experimental group, the Spring 2004 semester, received a full outline of the notes from the lecture without any blanks.

METHODS OF DATA COLLECTION

At the end of the unit, the researcher compiled all the test scores for both the experimental and control groups. Since the researcher was the instructor for both classes, total access to all grades earned by the students was available. The grade on the test was

determined by dividing the number of questions answered right by the total number of questions on the test. The numerical scale for students test grades was as follows: A=94-100, A-=90-93, B+=87-89, B=84-86, B-=80-83, C+=77-79, C=74-76, C-=70-73, D=60-69, F=below 60.

STATISTICAL ANALYSIS

The unit 2 test grades of the students enrolled in both the experimental group and control group were compared by the researcher to determine if there was a significant difference between the group that received a full lecture guide and the group that received a fill in the blank note taking guide. A one-tailed t-Test was used to analyze the data. The unit 2 test score earned by each student was the only data that were analyzed.

SUMMARY

Chapter III, Methods and Procedures, of this study described the population that was studied as well as identifying the variables that affected the population. The chapter also described the procedures that the researcher followed in the classroom. Additionally, the data collection methods and the instrument used to perform the statistical analysis were discussed. The results of this study will determine whether notes that were a copy of the entire lecture will affect student performance on exams. The finding of this statistical analysis will be discussed in Chapter IV.

CHAPTER IV

FINDINGS

This study examined the unit two grades of students enrolled in the OTS 220, The Fashion Industry, class at Old Dominion University during the Fall 2003, and Spring 2004, semesters to determine if the experimental group, which received a full outline of the notes, earned higher grades than the control group, which received a fill in the blank version of the notes. This chapter presents all the relevant data that were collected and provides a statistical comparison using the sample mean from each group of students to test the predictive hypothesis.

DATA

Appendix A illustrates the grading scale that was used for both the control group and the experimental group. Appendix B provides a listing of the total points earned and letter grade earned on the unit two test for the control group. Appendix C provides a listing of the total points earned and letter grade earned on the unit two test for the experimental group. The table of critical values for t is presented in Appendix D.

RESULTS

The mean score for the control group was based on the 29 students enrolled in the Fall 2003, class, and the mean score for the experimental group was based on the 27 students enrolled in the Spring 2004, class. Table 1 contains the population and the mean unit two test score for both the control and the experimental group.

Table 1: Mean Unit Two Test Scores

Test Groups	Population	Mean Unit Two Test Score
Control Group	29	79.8
Experimental Group	27	79.7

The mean unit two test scores for the control and experimental group were collected and the single-tailed t-Test was used to determine statistical significance of the results. The mean unit two test score for the control group (M_1) was 79.8, while the mean unit two test score for the experimental group (M_2) was 79.7. Using a degree of freedom of 54 at the .01 level of significance the critical t-value was determined to be 2.39. The t-value was 2.5 with a population size of 56. The results are indicated in Table 2.

Table 2: Comparison of Populations at the .05 Level of Significance

	Population	Mean	Critical t-value	Study t-value
Control Group (M_1)	29	79.8	2.39	2.5
Experimental Group (M_2)	27	79.7		

SUMMARY

This chapter presented the data collected during the study and the method of statistical analysis that was utilized to determine whether or not there was a significant difference in the unit two test scores earned by students who received a full outline of the chapter notes versus those students who received an fill in the blank version while taking

OTS 220, The Fashion Industry, at Old Dominion University during the Fall 2003, and Spring 2004 semesters. The mean unit two test scores for both groups was compared and subjected to a single tailed t-Test to determine statistical significance. In Chapter V, a summary of the method of data analysis and the final conclusions will be provided based on statistical analysis of the findings. Additionally, recommendations for future studies will be presented.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this experimental study was to determine if there was a significant difference in the unit two test scores earned by students that received a full outline of the notes versus the unit two test scores earned by students that received a fill in the blank version of the notes while taking OTS 220, The Fashion Industry, at Old Dominion University during the Fall 2003, and Spring 2004, semesters. This chapter summarizes the study, draws the conclusions based on the findings, and offers recommendations for further studies.

SUMMARY

The goal of this study was to determine whether students who received a full outline of the notes for a specific unit earned higher grades than students who received fill in the blank versions of the notes for the same unit. The hypothesis that established the framework and guided the research for this study was:

H₁: Students in OTS 220, The Fashion Industry, who received a copy of the PowerPoint lectures for a specific unit of instruction from the instructor will earn higher grades on exams than when they received a basic fill in the blank note taking guide.

Taking notes is fundamental to the learning process. If a student does not take notes, they have to use their memory in order to retain the material that is presented in class. If the instructor provides notes for the students, the students do not have to copy everything that the instructor is presenting. This helps the student listen to what the

instructor is saying. If the student is listening, they can better understand the information. Today, many instructors are using PowerPoint as a lecture tool. With the use of PowerPoint as a lecture aid, instructors can easily provide notes for their students. The question is what type of note taking guide and how much of the notes should they be given? Students today learn in many different ways. The traditional teacher at the podium is not as effective today. Students are becoming visual learners. If they do not have to take notes, they are able to free up their hands and listen and visualize. One could anticipate that by doing so, the information will be recalled on the exam. Therefore, this study attempted to determine whether notes that were a copy of the entire lecture would affect student performance on exams.

The study was limited to the students in the OTS 220, The Fashion Industry, course taught during the Fall 2003, and Spring 2004, semesters at Old Dominion University. The researcher was a graduate assistant teaching this course. The classes were taught in two different semesters. The same instructional material was used for both groups.

The students in both the control and experimental group were mostly female and had random ethnic backgrounds. The students were enrolled in various degree programs within the university system. Both groups were a mix of sophomores, juniors, and seniors.

The control and experimental groups were provided with different forms of note taking on the unit two section of study during the semester. The researcher kept a record of the grades earned on this unit two section of study. The data was stored electronically and hard copy format.

Upon completion of unit two, the researcher compiled the data from the control group and experimental group. The score earned by each student was recorded and the mean for each class was determined. The research utilized a one-tailed t-Test to determine if there was a significant difference between the grades earned by the control group and the experimental group. The conclusion on the resultant data follows.

CONCLUSIONS

The goal of this study was based upon the following hypothesis:

H₁: Students in OTS 220, The Fashion Industry, who received a copy of the PowerPoint lectures for a specific unit of instruction from the instructor will earn higher grades on exams than when they receive a basic fill in the blank note taking guide.

The statistical analysis of the data collected for this study resulted in a t-value of 2.5.

This value exceeded the value of 2.39 obtained from the table of critical values at the .01 level of significance. Therefore, the hypothesis was accepted.

Even though the experimental group and control group had similar mean scores, the analysis of data determined that there was a significant difference resulting from the form of notes that were given to the students. Based on these results the following recommendations are provided.

RECOMMENDATIONS

This study reported that a full copy of the lecture notes provided by the researcher does make a significant difference on student's grades. It is important to note that the means of each group were very close. The review of literature pointed out that this

allows students to listen more and they do not have to be so preoccupied with writing. Students are also not as likely to copy anything incorrectly because they have it in front of them already.

There are a couple of factors that could have skewed the results. The control group had one score that was much lower than any others. In the future, it is recommended that the highest and lowest scores be thrown out to even the analysis.

Another factor that may have skewed the results was the number of students in each class. The control group had 29 students while the experimental group only had 27. It is recommended that the study be conducted on classes with the same number of students.

A third recommendation would be that the study be conducted on classes that are taught at the same time during the same semester. The control group took the course during the fall in the morning. The experimental group took the course during the spring in the afternoon. These time frames for learning might have affected the final results.

The final recommendation is that future studies be conducted by other researchers. This researcher was only a teaching assistant and is just beginning to gain experience in teaching. Note taking is vital to the educational process, and it is important to determine what type of note taking is most valuable.

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APPENDIX A – OTS 220 Grading Scale

Percentile Range	Letter Grade
90-100	A
80-89	B
70-79	C
60-69	D
59 and below	E

APPENDIX B – Control Group Unit Two Grades

Student Number	Percentile	Letter Grade
1	90	A
2	90	A
3	87	B
4	85	B
5	86	B
6	73	C
7	70	C
8	96	A
9	88	B
10	92	B
11	78	C
12	56	E
13	83	B
14	85	B
15	83	B
16	79	C
17	84	B
18	85	B
19	62	D
20	82	B
21	73	C
22	87	B
23	84	B
24	63	D
25	82	B
26	71	C
27	80	B
28	66	D
29	73	C

APPENDIX C – Experimental Group Unit Two Grades

Student Number	Percentile	Letter Grade
1	85	B
2	83	B
3	77	C
4	78	C
5	77	C
6	93	A
7	84	B
8	92	A
9	73	C
10	89	B
11	80	B
12	87	B
13	66	D
14	71	C
15	81	B
16	88	B
17	75	C
18	89	B
19	87	B
20	65	D
21	74	C
22	94	A
23	77	C
24	78	C
25	62	D
26	84	B
27	63	D

APPENDIX D – Table of Critical Values for t

One-tailed Significance

Degrees of Freedom	.05	.01
1	6.31	31.82
2	2.92	6.96
3	2.35	4.54
4	2.13	3.74
5	2.01	3.36
6	1.94	3.14
7	1.89	2.99
8	1.86	2.89
9	1.83	2.82
10	1.81	2.76
11	1.79	2.71
12	1.78	2.68
13	1.77	2.65
14	1.76	2.62
15	1.75	2.60
16	1.74	2.58
17	1.74	2.56
18	1.73	2.55
19	1.72	2.53
20	1.72	2.52
21	1.72	2.51
22	1.71	2.50
23	1.71	2.50
24	1.71	2.49
25	1.70	2.48
26	1.70	2.47
27	1.70	2.47
28	1.70	2.46
29	1.69	2.46
30	1.69	2.45
31	1.69	2.45
32	1.69	2.44
33	1.69	2.44
34	1.69	2.44
35	1.69	2.43
36	1.688	2.43
37	1.687	2.42
38	1.686	2.42
39	1.685	2.42
40	1.684	2.42
41	1.683	2.42
42	1.682	2.41
43	1.681	2.41
44	1.68	2.41
45	1.679	2.41
46	1.679	2.41
47	1.678	2.40
48	1.677	2.40
49	1.677	2.40
50	1.676	2.40
51	1.675	2.40
52	1.674	2.39