The Testing Effect and How It Affects the Performance of 6th Grade Students
Caitlin Gallagher, Nyack College

December 18, 2012

Abstract

The testing effect is a useful method of instruction. However it has only been used sporadically as an instructional method. This study examined whether or not students perform better on average with an increased amount of tests in comparison to an average amount of tests. The study was conducted over a period of two weeks when the students received an increase of tests aligning with the state and Common Core standards. At the conclusion of the two weeks, the average of the group of students with the testing effect was compared to the average of the group without the testing effect.

Introduction

Testing is a significant part of education, perhaps even the most important form of assessment. Through testing, educators determine academic level, curriculum, disabilities, aptitude, and other significant parts of life. Therefore, the amount of testing given must be taken into account. Educators must examine whether more tests will help or harm students in their comprehension and understanding of subjects. The testing effect refers to the finding that taking an initial memory test after an encoding episode enhances performance on a later memory test (Chan and McDermott, 2007). However, the testing effect has been used only sporadically over the years (Roediger & Karpicke, 2006). This means the testing effect has rarely been tested in a classroom setting for academic purposes. The question therefore becomes, Does an increase in the number of tests a student takes increase their comprehension and test scores?

The purpose of this study was to examine the testing effect in practice. Specifically, the study observed whether or not an increase in testing increased students' overall comprehension and understanding of the concepts and materials taught.

The expected outcome of the study was that the testing effect would prove effective. The learning strategy would cause the students to access their memory in order to recall important details more readily. Namely, the testing effect would have significant effect on the students' test scores and comprehension in reading.

The independent variable of this study was the group of students when not treated with the testing effect and then the same group being given the testing effect. The dependent variable was the results of the final test, after the increased tests, versus the average amount of tests. Together these two variables define the groups of testing effect and non-testing effect operationally.

Literature Review

There is little research on the testing effect and how it can be effectively used in the classroom. In general, previous studies have focused specifically on reading and language as the areas of testing. The studies explicitly sought to enhance memory and the recollection of studied facts in regards to testing.

Previous studies have researched whether the testing effect creates more instant or more prolonged results (Wheeler & Roediger III, 1992). The research found that the testing effect revealed no increase in memory in a five-minute span. However, over a period of time the testing effect proved effective in training memory and recall of facts; suggesting the testing effect needs time to be effective.

When used effectively, the testing effect can be used to memorize important concepts. The testing effect can even be used to recall paragraphs or important novel questions (Hinze & Wiley, 2011).

Other studies have confirmed that the testing effect takes time to be utilized properly. The testing effect seeks to have students test their own knowledge over and over in order to better comprehend the information;
hence, the students are given little feedback. Research found that tests given shortly after the information do little to assist in the recollection of information. However, tests given over the course of several days or over several weeks are proven to be far more effective in memory retrieval. (Roedger III, & Kapricke, 2006).

The testing effect does have further uses, however. The strategy can be used to assist in learning other language-based ideas. It can be used to study symbols and languages and to pair a specific symbol with its word meaning. Therefore, the testing effect can branch out into further areas of study (Roekers, Coppens, & Verkoeijen 2011).

The testing effect, however, is not perfect. Educators do not always recommend its heavy emphasis on memorization. It also does not guarantee that students understanding and comprehension will improve every time. It can also create a negative effect if utilized too much (Roedger III & Kapricke, 2006). However, these negative effects are often small and do not cancel out the large positive effects of testing.

Method

The population is all sixth grade boys and girls taught in the state of New Jersey using a curriculum that follows the New Jersey state standards. The sampling will come from the sixth grade students of a private Christian school. The grade consists of thirty students. The makeup of the classroom is as follows: about 60% of the students are Black, 30% White, and 10% Hispanic. About 30% of the students have Individualized Education Programs (IEPs), learning disabilities, classroom aids, or English for speakers of other languages (ESOL).

The subjects were unaware of the study while it was being conducted. No information on the testing was distributed to participants or those outside the study. The study was valid in that it measured student comprehension based on test scores. Researchers have already previously utilized the testing effect as a learning strategy, meaning this study is reliable. The material is based on the standard state curriculum and is therefore easily reproduced.

The material covered included reading, specifically the topic of figurative language. Students were given a series of oral questions. The questions asked them to define or label the following terms: simile, metaphor, personification, alliteration, and hyperbole. The students were given other questions based on the current reading so as to ensure they were not merely practicing rote memorization with the terms. The tests covered from five to ten questions. The score was based on the number correct out of a total number of questions on quizzes. A percentage was then given to each test according to their answers. All tests were given in English. The curriculum and tests followed the New Jersey State standards as well as the Common Core standards. This study applied to all the above courses as they all are from the Common Core and state standards.

The time for this study was two weeks. Prior to the implementation of the testing effect, participants were exposed to the average or normal amount of testing.

The assessments used to measure this hypothesis and study were the increased number of tests in each reading selection. The tests were distributed, conducted, collected, and evaluated. After the two weeks, the scores for the test without the testing effect and the final test with the testing effect were recorded in a computer program. The scores were then evaluated in a reliable program.

The starting level for the students was their average amount of testing prior to introducing the testing effect. Students took a pre-test on the Reading figurative language terms and uses to assess their starting level.

The expected outcome was that the testing effect would have a significant effect on students' testing. The testing effect would increase students overall comprehension and understanding in the subject of Reading, specifically in the study of figurative language. The independent variable of the group without the testing effect would give the necessary comparison. The dependent variable would be the score of the final test with the testing effect. The expected outcome was that the students would see an increase in their test results when compared to the pre-test.

Findings

An independent-samples T-test was conducted to compare Post-test to Pre-test grades in students who received an increase in testing over 2 weeks. There was a significant difference in the scores of students in the pre M=29.33, SD= 33.1 and post tests M= 82.9, SD= 13.81; t(58) = -8.179, p= .000. Based on these results we reject the null hypothesis and therefore we accept the research hypothesis.

The charts below analyze the different parts of the study and hypothesis. The hypothesis originally stated that the testing effect would have a significant effect on the students final test scores and overall comprehension. The significant results also coincide with previous studies, which also found the testing effect to be a significant learning strategy.

Figure 1 maps out the frequency of each particular score. The frequency is based on all scores of pre- and post-tests. Therefore, 0% is the most frequent score due to the collective pre-test. The second highest score is 80% based on the scores of the post-test. This table further demonstrates the significant effect of the testing effect.
Table 1 compares the pre test scores to the posttest scores. It gives the mean and standard deviation of each test.

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<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>SD</th>
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<tr>
<td>1</td>
<td>28</td>
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<tr>
<td>2</td>
<td>32</td>
<td>82.90</td>
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</table>

Table 2 compares the pre- and post-test scores and gives the level of significance.

<table>
<thead>
<tr>
<th>t</th>
<th>df</th>
<th>Sig</th>
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<tr>
<td>-8.179</td>
<td>58</td>
<td>.000</td>
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</table>

Conclusions

Based on these findings, the hypothesis can be accepted. The testing effect proves to be significant as a learning strategy. Students were reluctant to participate in such tests. In going forward the testing effect is an invaluable teaching strategy. However, those who might use it should be wary of students’ reactions to it. The students were often displeased with the number of tests. Students’ attitudes can be a factor in how they learn and perform during assessment. Also, students should remain unaware of the use of the testing effect. Students in this study were unaware of which test counted more toward their final grade. Their lack of knowledge ensured their highest effort on every test. This prevented any participant bias by evaluating the importance of the results for themselves. The testing effect is a useful learning tool but must be utilized properly.

References


Caitlin Gallagher is currently teaching English and Reading as the 6th grade head teacher at Abundant Life Academy.
Using Stories to Teach Social Studies Cultural Content to 6th Grade Students
Rebecca D. Collins, Nyack College, December 17, 2012

Abstract

There is little research in existence on the benefits of using stories to teach content-area subjects. The information gained in this study helps educators know what methods of teaching work best for teaching culture in a social studies class. This study examines test scores participants receive when taught using lecture and story/discussion. The hypothesis is 6th grade students will achieve a significantly higher score on a test assessment after being taught social studies culture content using a story and discussion as compared to those being taught social studies culture content using lecture. The participants are 15 students from a 6th grade classroom. Two cultures are taught using the two different teaching methods above and then students are given a 10-point test in the same format after each lesson. The scores are compared using a t-test and analyzing mean scores on each test. The results show the findings are not significant. Further testing should be done on this topic over a significant length of time to see if the results are affected with long term teaching strategies rather than using a short lesson one time to show results.

Introduction

Problem

In education, a problem that needs additional research is what teaching styles are most effective for student achievement. Teachers need to know what teaching styles are most effective for student learning in content areas so that achievement will be as high as possible. Research has shown that stories are able to capture the reader’s emotions and interest (Freeman, Feeney, & Moravcik, 2010). Stories have been used to effectively teach morals or act as instigators for deep discussions (Caruthers, 2006), but now the effectiveness of stories used to teach content such as culture will be studied. This information will benefit teachers as they decide which teaching strategies will be most successful in teaching content to an upper elementary school class. The content of culture is appropriate, as this is a major social studies content area which is taught across all grade levels. It is part of the primary content of social studies and is wide-reaching. The information gained in this study will benefit teachers as they decide which teaching strategies will be most successful in teaching content to an upper elementary school class. This study will specifically relate to social studies culture teaching in the 6th grade, but has potential to be studied across all content areas and all grade levels to further this research.

Purpose of the study

The purpose of this study is to compare two different teaching styles, lecture/notes and story/discussion, through research on test achievement following lessons in each style.

Hypothesis

The researcher hypothesizes that 6th grade students will achieve a significantly higher score on a test assessment after being taught social studies culture content using a story and discussion in comparison to being taught social studies culture content using lecture. The null hypothesis is that no difference will exist in scores on a test assessment after being taught social studies culture content using a story and discussion as compared to being taught social studies culture content using lecture and notes.

Variables

The independent variable is two groups of students taught by different methods of instruction, lecture and story/discussion. The dependent variable is the score of students on two tests, one after being taught using the first teaching method and one after being taught using the second teaching method.

Limitations

One limitation of this research is the limited convenience sample which was used for this research. There is also a limitation in that two separate tests will be used to measure achievement, and so specific precautions must be put into place to ensure the two tests measure the same content and are comparable. These precautions are discussed further in the methods and description of instruments section.

Reliability and validity

Due to the limitations of this study there is no way to assure reliability unless culture tests #1 and #2 are given to more students with similar results to the first research test. The research has been designed so that future studies could replicate the lesson done and this would prove reliability is given multiple times to a variety of students. Validity has been checked by having all questions come directly from the content that is taught in the lesson, questions being looked over by multiple teachers, and questions being similar between the two tests. Although two different cultures are being tested, the tests have been designed to ask the same type of questions in the same format, which will allow the two tests to be compared and still have valid research results.

Literature Review

The majority of literature relating to story and discussion as a teaching tool relates only to comprehension. There has been minimal research on how using story/discussion to teach content area information affects student achievement. There is a good deal of literature that can create a foundation for
using similar research methods in a content area setting. Many of these researchers have done studies on comprehension and the use of stories to teach morals or start discussions.

Theories

One commonly held theory is that using stories in teaching will interest students and be motivating. Freeman, Feeney, and Moravcik (2010) even used children’s literature to teach college students who found the stories interesting and enjoyed class time a great deal. Hunter and Eder (2010) suggested that storytelling has the power to stir emotions, which allows students to connect to the content and improve understanding. Tavil and Soylemez (2008) used stories as a teaching tool because of their capability to be enjoyable, and to motivate and create a desire to learn. They also state that stories give students a purpose for listening to content and paying close attention.

A second theory is that stories can be used to encourage discussion. Hunter and Eder (2010) showed through research that students were able to relate to stories and shared their own experiences, which allowed for an in-depth discussion of morals. Research completed by Freeman, Feeney, and Moravcik (2010) showed that literature contributes to sensitive issues, discussion, and examination of universal truths. Caruthers (2006) used stories to promote deep thinking and exploration, which contributed to indepth discussions.

How the method has been effective in the past

Using stories to teach moral/ethic decision-making skills to 4th graders was successfully achieved in a study by Hunter and Eder (2010). Fables were combined with open-ended questions and discussion to have students look deeper into why a decision is right or wrong. Freeman, Feeney, and Moravcik (2010) used stories to teach college students and when surveyed about the course, research showed that students felt stories created a caring environment and contributed to content understanding and personal growth. Tavil and Soylemez (2008) worked with non-English speaking Kindergartners to teach English vocabulary words through repetitive stories. Their results showed all the students learned the words at a recognition level and 1/3 of the students were able to produce the vocabulary words. One study done with school administrators by Caruthers (2006) successfully used storytelling to start in depth discussions on cultural differences in schools.

Defining the teaching methods chosen.

Often stories are focused towards discussion or moral issues as seen in the research above. Little research has been done to show how stories impact content understanding. This study focuses on teaching culture to 6th grade students using stories compared to using lecture. The most similar recent research is Tavil and Soylemez’s (2008) studies in which stories were used to teach vocabulary with an emphasis on content. The teaching method in this study will be different.

However, the previous study was done with Kindergartners using a repetitive story read regularly over the course of several weeks. With 6th grade students the method chosen was a short story and discussion about what culture is shown in the story.

Method

Overview of the study

The research was done through action research and quasi-experimental research. It was designed in two teaching/testing segments. Students took a test after being taught each culture lesson and the scores were analyzed to show any results between the teaching strategies.

Participants

The participants of this study are the 15 students in the 6th grade class at a private Christian school in NJ. All of the students are 11 or 12 years old. There are 9 female participants and 6 male participants. The ethnicities of the students are 7 Black, 5 Caucasian, and 3 Hispanic. Seven participants have extra needs for speech, English for speakers of other languages (ESOL), or Individual Education Programs (IEPs).

Sampling

These participants were chosen through a convenience sampling of one 6th grade class at a private Christian school in NJ. The 15 students formed the group, which was given both teaching styles and tests.

Instrument

The two tests being administered collect the data to be analyzed. If given the assessments prior to teaching the content, it can be assumed that the participants would know little to no information that is contained on the test. Therefore, any questions a student answers correctly on the assessment were considered a learning gain. Each test is a 10-point test of cultural knowledge based on what was taught in the lesson. There are 5 true/false questions on each test and 5 fill-in-the blank questions on each test.

Procedure

During each segment the participants were taught the culture of a group of people and learned about the language spoken, common foods, typical values, family dynamics, and religious beliefs. Both cultures hold little background knowledge for the participants and the content difficulty was assumed to be equal. The researcher taught a 15-20 minute lesson on culture #1 using lecture and notes and administered the culture #1 test to all students. The test was collected and graded by how many answers the student correctly completed out of 10. For the second segment, the researcher taught a 15-20 minute lesson on culture #2 using a story and a brief discussion about the culture in the story and administered the culture #2 test to all students. The test was collected and graded by how many answers the
student correctly completed out of 10.

Collection of Data
Data was collected through scores students achieved on the culture #1 test and the culture #2 test. 15 students took each culture test and put their student number on the top to be sure that data was collected from each student.

Analysis of Data
The scores are broken down by type of question, true/false, and short answer, to further analyze the tests. Scores are then compared to analyze which teaching strategy resulted in the highest scores using mean, individual difference in achievement, and comparison, to see if each question type revealed the same results. The test score data is collected, the mean of each test is found, and a t-test is used to measure significance.

Results

Results of analysis of data
An independent-samples t-test was conducted to compare the post-assessment scores after being taught using lecture and the post-assessment scores after being taught using story and discussion. There was not a significant difference in the scores for students who were taught using lecture (M=8.60, SD=1.183) and students who were taught using story and discussion (M=9.20, SD=1.373)

Table 1 Mean and SD

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scores</td>
<td>15</td>
<td>8.60</td>
<td>1.183</td>
</tr>
<tr>
<td>Lecture</td>
<td>15</td>
<td>9.20</td>
<td>1.373</td>
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</table>

The t-test shown in Table 2 found that t(28)=-1.282, p=.210. The means of the two tests showed that the students did score an average of .6 better on the story/discussion test and there was also a .2 higher standard deviation for that test. The differences of score on the two tests were not enough to show a significantly higher score between tests.

Table 2 t-Test

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<th>t</th>
<th>df</th>
<th>Sig (2-tailed)</th>
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<tr>
<td></td>
<td>-1.282</td>
<td>28</td>
<td>.210</td>
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9 students out of 15 scored a perfect 10 on the story/discussion test while only 4 students out of 15 scored a perfect 10 on the lecture test. Although many student grades rose a point or two on the story/discussion test, there were also students whose score decreased from the previous test. Table 3 shows each student's score on the lecture portion of the lesson and the story/discussion portion. Figure 3 shows a breakdown of race and gender scores on both tests.

Table 3 Raw Data

<table>
<thead>
<tr>
<th>STUDENT #</th>
<th>Lecture Score</th>
<th>Story/Discussion Score</th>
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<tbody>
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<td>7</td>
<td>10</td>
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<td>2</td>
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<td>15</td>
<td>10</td>
<td>10</td>
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</table>

Results of testing the hypothesis
Based on these results the null hypothesis cannot be rejected, therefore the research hypothesis cannot be accepted.
Discussion

Significance of the results
These results show that in one lesson on culture, lecture and story/discussion both bring similar achievement results for students. Stories have been effective for promoting discussion and moral evaluations in prior research, but it may not excel beyond other forms of content teaching. This study taught culture equally as well as lecture, but not enough to be better than lecture. This shows that stories are appropriate to teach culture, but may not be more effective than any other method.

Implications of the results
The results point out that lecture and story/discussion are both effective ways to teach culture, although one cannot be considered better than the other. Previous research shows that stories were successful in teaching vocabulary. Given the results of this research that showed effective culture teaching, it may be that stories are effective at teaching multiple content areas.

Suggestions for further study
This study provides many further options for research. There was no significant difference between lecture and story/discussion in short one-time lessons, but study should be done to see if long-term culture studies using story/discussion change the findings. 6th grade was the sole age tested, so looking at this for older high school and college students, as well as the effects on young elementary school students, could be beneficial in determining if this teaching strategy is effective at all age levels. This small step into content also lends to further research into stories to teach other content areas such as science and math. Study could also be done to determine the characteristics of a story that are effective in teaching content matter.

Conclusions
Although this study did not show a significant difference in effectiveness of the two strategies, it did show that teaching content can be done effectively through stories. There are also many options for further study that have been brought out through this study. The options for using stories to teach content are great, and teachers and researchers should explore how stories can be implemented into their teaching to understand

References
Hunter, C., & Eder, D. (2010). The role of storytelling in
Testing Effect on Spelling Test Scores  
Shannon Darby, Nyack College, December 2012

Abstract

An inability to spell adversely affects a person’s academic success (Simonsen, Gunter, & Marchand-Martella, n.d.). The study investigated testing effect on 4th grade students’ test scores at Linden Elementary. The null hypothesis for this research stated that the testing effect will have a negative or no effect on the spelling scores achieved by all 4th grade students. The directional hypothesis states that the testing effect will have a positive effect on 4th grade students spelling test scores. The independent variable was the instructional strategy (testing effect) and participants’ scores were the dependent variable. The data from the participants’ scores were calculated and analyzed using a T-test, comparing the scores of the student’s pretest (without treatment) and then after the testing effect was implemented (with the treatment). The participants were accessed after a ten-week period; five weeks in group 1 (without the treatment) and group 2 (with the treatment). The finding indicated that the testing effect improved all 4th grade students’ spelling test scores. The variability in the students who received the testing effect from those who did not is significantly different. There is a statistically significant difference between the two conditions because of the independent variable (IV) manipulation. Therefore the researcher rejected the null hypothesis (Ho) and accepted the directional hypothesis (Ha). The data analyzed through convince sampling using a t-test with a=.05, indicated a significance level of .024 between groups 1 and 2. Further study of methods employed in improving academic scores in spelling and other areas like math and reading comprehension, between male and female participants, as well as among the disabled community, such as blind or ADHD participants, should be explored.

Introduction

Problem

Spelling is important because it aids a child’s reading fluency (Templeton, 2001). It also helps to cement the connection that is shared between sounds and letters (Hallahan, Kauffman & Pullen, 2012). There is a strong positive correlation between a student’s high spelling scores and his academic success (Wilkins, Hartman, Howland & Sharma, 2010; Yerdon, 1994). Across the nation many student struggle to spell grade appropriate words (Dvorak). Providing students with higher spelling scores would suggest better grades in other academic areas.

Purpose

The purpose of this study is to investigate what effect the testing effect has on spelling scores. Linden Elementary students were failing their weekly spelling test. More frequent testing would suggest a greater possibility of students receiving high test scores. The study focused on gathering data in the form of paper-pencil assessment. The participants had to write the correct words down on a blank sheet of paper. The study is designed to uncover the effect of frequent testing on spelling scores for 4th grade Linden Elementary students. The data obtained from this study can be applied to other participants and content.

Hypothesis

HO for this research stated that the testing effect will have a negative or no effect on the spelling scores achieved by all 4th grade students. HA states that the testing effect will have a positive effect on 4th grade students’ spelling test scores.

Variables

The study included one independent variable in the study was the method of the testing effect or frequent test. The dependent variable was the participant’s scores.

Terms

Testing effect – the psychological effect of habitually testing someone’s memory (Roediger & Karpicke, 2006).

Attention deficit hyperactivity disorder or ADHD - a problem with inattentiveness, over-activity, impulsivity, or a combination (Hallahan, Kauffman & Pullen, 2012).

Reliability and Validity

The study had reliability because the participants are the same in the first and second group. Data was collected before the IV was introduced. In determining the validity of the research project, various researchers emphasize the importance of spelling on the academic success of students. (Gentry, 2004). The spelling words used were based on 4th grade common core core standards. All students are tested on the same spelling words. Therefore everyone in group 1 is being assessed the same common core spelling words for that week.

Review of Literature

Einstein (2012) compared different methods to discover the validity of the testing effect strategy. These results link the testing effect to students’ improvement in learning and memory because it encourages them to utilize their explicit memory. Therefore the students are consciously recalling events and information. Greenberg (2006) referred to the testing effect as an effective teaching strategy that aids retention even in easily distracted students. Henry (2002) investigated a nationwide study that determined in students between the ages of four to fourteen years of age, spelling test scores are declining. His results indicated that these students are making more spelling errors than in previous years (2001). Murray and Steinin (2011) investigated the frequency level of student’s receiving low spelling scores and determined that approximately
30% of most students are in need of a spelling intervention. The study also indicated that researching strategies to improved children spelling scores is a valid topic. Park and Choi (2012) uncovered a positive correlation between frequent testing and students' retention. Reed’s (2012) study offered strategies to improving their spelling abilities and development of more complex skills. This research also validates the importance of spelling and the possible negative implication of poor spellers. Reed compared different strategies to improving children’s spelling abilities and development of more complex skills. This research also validates the importance of spelling and the possible negative implication of poor spellers. Sanchez, Magnan, and Ecalle (2012) identified a positive correlation between spelling accuracy and reading comprehension. The commonality among all the research is that spelling fluency will improve a child comprehension, and spelling fluency can be achieved through the testing effect.

Method

Overview of the study
Using a research method of quasi-experimentation, the study investigated the differences in participant scores when the treatment of the testing effective was applied. The testing occurred over a ten-week period in Linden Elementary 4th grade classroom. A sample of convenience comprised of 13 African American students, with 5 girls and 9 boys. All students are between the ages of 9 and 10 years of age, except for one student who is 8 and will be 9 on November 9. Everyone else will be 10 by January 1, 2013. The first five weeks of the study the participants were not introduced to the testing effect; the remaining five weeks the students were introduced to the treatment and tested daily. Data was collected on a score sheets for later analysis using T-tests of significance between participant scores without the implementation of the testing effect and scores with the testing effect.

Participants
The sample of convenience composed on a volunteer basis was comprised of thirteen African American participants, five girls and nine boys. All students are between the ages of 9 and 10 years of age, except for one student who is 8 and will be nine years old on November 9. Everyone else will be ten on 1/1/13. Since the sample was one of convenience, it is not considered a representation of the population. The sample was not stratified by culture, gender, or other qualifying attributes. There are possible errors in the study due to the higher percentage of boys than girls found in the study. The use of the classroom at Linden Elementary School eliminates practicality of the experiment.

Instruments
The testing effect is the testing instrument used for this study. The testing effect alters the weekly spelling assessment to daily test. The participants have to write the word as the instructor says it out loud. For each correct answer, the participant received a score of one point.

Data Collection
Every week at 1:00 pm at the Linden Elementary School, Shannon Darby selected a convenience sampling of Linden Elementary School students ranging from 8 to 9 years of age. Each participant who volunteered was provided with a blank sheet. They had to write their name and the correct spelling of the words that the instructor says out loud. The convenience sampling had external validity because it identifies the effect of frequent testing on Black 4th grade students. In addition, all participants complete a trial with treatment for five weeks and a trial without treatment for five weeks. During the treatment week students were tested daily, and during the non-treatment weeks they were tested weekly. The experimenter analyzed the data to determine if there is a difference in participants’ scores between the two testing conditions.

Results
At the alpha level of 0.05, the T-test results in Table 2 indicate a significance difference, at .000, in participants’ scores between the testing effect in the treatment and the non-treatment group.

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<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
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<td>Group 2</td>
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<td>Sig (2-tailed)</td>
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Discussion

The experimental data show a significant difference in the scores for IV level 1 (M=48.50, SD=21.86) and IV level 2 (M=90.00, SD=8.16) conditions; t(18)= -5.62, p = .000”. Based on the data the researcher rejected the null hypothesis and accepted the research hypothesis.

Conclusion

The results suggest further study investigating the methods, strategies, and functionality of the testing effect on a variety of races, ages, and gender. Furthermore, memory experiments using other forms of assessment rather than pen and paper could be explored, such as the testing effect through the use of technology.

References


Distinctives of the Christian Educator

By James Nichols, PhD

Abstract

The concepts of Faith Integration and Teaching Christianly are defined as distinctives of the Christian educator. These two concepts are described as being an integration of Biblical truth and secular educational theory as viewed and filtered through the lens of scripture. The concepts are developed using Christian authors, scripture, and actual examples of application of this philosophy in a Christian college setting. The conclusion is that a Christian institution should not weaken its Biblical position to meet state or national standards in fear of losing its accreditation status.

Introduction

How does the Christian educator apply secular theories of teaching and learning to the development and implementation of curriculum and instruction in school settings? What makes the Christian educator distinctive from the non-believing teacher?

This essay will briefly attempt to answer the aforementioned questions comparing Christian and secular authors and theories about education. This author will present his position that appropriate Faith Integration and Teaching Christianly require a symbiotic relationship between scriptural truth and secular theory.

This paper will answer the following questions:

- How does a Christian educator differ from his/her non-believing counterpart?
- What are the critical differences between Christian and secular teacher preparation programs?
- What characteristics does the Christian classroom exhibit?
- How does an outside teacher-accrediting agency regard a distinctively different institution?

Three Distinctives

The first area of distinctiveness is that of the perspective of the Christian educator.

Christian psychologists Issler and Habermaas (1992) blame the Mystifiers (educational psychologists) and Mystified (teachers) for respectively spreading and tolerating confusion. Issler and Habermaas state a Christian teacher’s perspective significantly differs from the secular/non-believer’s view in that it must include both the natural and the supernatural aspects of the learning process.

Unfortunately my experience with many Christian educators, especially as a presenter at Christian schools conferences, has been that many Christian educators condemn secular theories and theorists as being “Anti-Christian”. This often results in an unbalanced, ineffective, non-research-based approach to the teaching process. Please understand that I am not condemning Christian institutions. I have proudly taught at one for fifteen years. I am, however, stating that a significant number of Christian schools could do a better job of preparing their students academically if they applied secular educational theory, when that theory is consistent with Biblical truth.

According to Issler and Habermaas (1990), there are two extreme views of education. These are that:

1. Learning among believers is solely through the work of God.
2. Learning among believers is solely through man’s efforts.

Both theories are obviously flawed. The former would eliminate the need for teacher planning or preparation or ultimately the need for teachers at all. The latter would eliminate the distinctiveness of learning for the Christian, including prayer and involvement of the Holy Spirit (1 Cor. 2:12-14). In most instances, God chooses to work through natural laws and human beings. Why should education be inconsistent with God’s working in other areas?

1 Peter 4:10-11 essentially defines teaching for us as: “Speaking the very words of God”. The author believes that the gift of teaching encompasses all aspects of the teaching-learning process for the Christian. For example, in his Educational Psychology course, he developed a unit on Teaching Christianly and paralleled Charles Swindoll’s Spiritual Gift of Teaching with classroom teaching. The author believes this comparison reflects what Faith Integration or Teaching Christianly should represent for the Christian educator.

I am not a theologian. I have been told by theologians that a spiritual gift is unrelated to a secular talent or ability. I cannot accept that. Since Christian teachers are responsible for honoring and glorifying God in all that they do, I believe that they are exhibiting the spiritual gift and talent of teaching, whether they are teaching scriptural truths or secular content.

Charles Swindoll (1990) identifies two types of pastoral gifts: Pastor-preacher and Pastor-teacher. Since scripture states that we are all members of a holy priesthood, I believe that Teaching Christianly (Van Dyk) or Faith Integration requires that a Christian educator should always be applying that spiritual gift or talent in whatever setting in which he/she teaches.

Swindoll states that teaching requires four loves which I believe should always be exhibited both in teaching the Word of God or classroom teaching. They are:
The teacher loves his

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James 3:1 states that teachers will be judged more harshly. Therefore, Christian teachers need to be prepared both spiritually and academically to serve as role models in their knowledge, skills, and dispositions, both spiritually and academically.

Howard Hendricks (2003) perfectly expresses the responsibility of the Christian teacher in the classroom. The author could not agree with Dr. Hendricks more:

“Christian education today is entirely too passive. And that's incongruous, because Christianity is the most revolutionary force on the planet. It changes people. (p. 53) I'm convinced that everyone—no exception—can be motivated to learn. But not at the same time...and not by the same person...and not in the same way. That's why you need to walk by faith to be a good teacher, and you need a lot of patience. (p. 103)”

Hendricks does an excellent job of illustrating the balance and passion needed to teach Christianly. His Seven Laws of the Teacher draw Scriptural support for effective teaching practices from Jesus, the greatest teacher there could ever be. Hendricks principles also clearly support the concepts of Gardner’s Multiple Intelligences and Dunn’s Learning Styles, when he states that: Everyone can be motivated to learn but not in the same way. Spiritual gifts, multiple intelligences, learning styles, and the Seven Laws, are all consistent with the individuality that God has built into each person.

The following example of a Faith Integration lesson illustrates how scriptural truth and secular theory can be supportive of each other.

As the culminating event of my Educational Psychology class, I set up a three-way role play/debate in which a Nyack College teacher candidate takes on a role of one of the following secular educational theorists: Piaget, Dewey, Kohlberg, Fowler, Erikson, Vygotsky, Bandura, or Knowles. The aforementioned role-playing teacher candidate totally supports the secular theory/theorists; a second teacher candidate attacks it/him as anti-Christian; a third takes a balanced view; i.e., how secular educational theory can fit into a Christian teacher’s Biblical worldview and philosophy. The class the creates a Venn Diagram graphically illustrating the value of a balanced approach to learning using Biblical truth and secular theory as long as the latter does not contradict scripture. I believe that this lesson clearly illustrates faith integration.

Obviously there are some distinctively non-Biblical aspects to secular educational theories; these need to be discussed and rejected. I see this teaching perspective as being consistent with a Christian perspective on life in general. God did not create evil. Evil is a misuse of good. It is the Christian educator's responsibility to use what is good about secular theory (in many cases most of it), without condemning/discard it as completely evil.

I believe there is support that the latter position may be the position of many Christian educators and preparers of Christian educators. For example, I have spent four years looking in vain for a usable educational psychology text written from a Christian perspective. Except for Issler and Habermaas, which is not a text for teaching educational psychology, I can sadly find nothing that provides this balanced approach.

As Christian educators we are responsible to integrate Biblical principles into our classrooms? How do we resolve this without distracting from our curriculum objectives?

What goes on in an effective and efficient Christian classroom?

Teaching Christianly

I would suggest that the solution is to Teach Christianly. Van Dyk (1990) describes Teaching Christianly in a Collaborative Classroom:

In the Christian taught classroom:

- The learning of one student is related to the learning of all students (1Cor 12:26)
- The students are responsible for both their own and each other’s learning
- The classroom provides a warm, secure, non-competitive environment (1Jn 4:18)
- Gifts, talents, and differences are recognized, encouraged, and celebrated
- Opportunities are provided for development and practice of discipleship skills and the Fruits of the Spirit (Gal 5: 22-23).

My interpretation of faith integration has both process and product components. That is how the curriculum is presented via methodology, classroom management, and teacher disposition. However, I would also suggest that faith-based content can also be seamlessly integrated. For example my previously mentioned Educational Psychology class curriculum requires teacher candidates to explore the relationships between spiritual gifts and talents, Multiple Intelligences and teaching and learning styles. Each of my courses has a final exam essay question asking teacher candidates to describe how they will integrate their faith into their public or private school teaching. Every syllabus has a student-learning goal on faith integration. Inconsistencies and consistencies between the secular texts we use and Biblical truth are discussed within the context of the lesson. Therefore curriculum teaching time is not negatively impacted by faith integration in the Teaching Christianly classroom environment.

Having provided a sample faith integration lesson, I will now present an illustration of an entire school of
education, which has faith integration as its philosophy of teaching.

Nyack College’s School of Education’s SALT (Service-Academics-Leadership-Teaching) model (Schepens et al. 2003) reflects the philosophy of faith integration as described in this paper. The SALT model with its Biblical support is as follows:

**Pursuing truth and preparing for service** is a motto that reflects the mission statement of the Nyack College School of Education. Teacher candidates are educated using the lens of evangelical Christianity to focus content and pedagogy to become capable, caring, reflective educators serving communities around the world or around the corner.

**SALT Model**

The professional faculty of the Nyack College School of Education believes several fundamental values for educators are derived from a Christian worldview. Matthew 5:13-15 provides the inspiration for the SALT acronym used in the logo and mission statement. Teacher candidates are commanded to be the salt of the earth and the light of the world. This summarizes the belief that candidates and professional faculty in the Nyack College School of Education strive to become, by God’s grace, individuals who season and enrich the lives of others, who become the preservative of hope and encouragement to others, and a healing agent serving others who need help overcoming the difficulties of life. The SALT acronym reflects this philosophy through its emphasis on pursuing truth (academics) and preparing candidates for service (service, leadership and teaching).

> If anyone wants to be first, he must be the very last, and the servant of all. (Mark 9:35)

**Service** expresses the belief that teacher candidates are focused on others rather than themselves. The belief that teachers look to the needs of others first moves the candidate from a teacher-centered model to a student-centered approach to teaching and learning. Focus on the student implies service to family and community. Candidates are called to have servant hearts and to use their knowledge and dispositions to positively transform their school, community, and world, reflecting A. B. Simpson’s founding principles for Nyack College in 1882.

> The fear of the Lord is the beginning of wisdom, and knowledge of the Holy One is understanding. (Proverbs 15:25)

**Academics** are the pursuit of truth. The pursuit of truth begins at Nyack College with a knowledge and understanding of God. It leads to spiritual and moral understandings as well as valuing the traditional content and pedagogical knowledge. It follows that teacher candidates must meet a stringent core curriculum and a content specialization. This produces a well-rounded candidate in the liberal arts who is competent in a variety of disciplines and expert in a selected field of study. Education courses build on the footings of content to provide knowledge and understanding of the teaching and learning process. Foundational to the understanding of both content and pedagogy are the moral and ethical perspectives that inform dispositions. Understanding of issues in diversity, equity and access become heartfelt knowledge that drives practice in these areas. Teacher candidates are prepared to use the tools of learning and inquiry, to integrate strands of technology, and to assimilate pedagogy and content into performance during field experiences and student teaching.

> I urge you to live a life worthy of the calling you have received. (Ephesians 4:16)

**Leadership** in a servant model is by example. Professional faculty and candidates model the behaviors and dispositions born of the values and morals of the Christian life. These values give vision to leadership that operates on principles of equity and diversity that transfigure school and community. Candidates follow a higher calling and become agents of transformation upon graduation. Candidates are expected to be role models personally and professionally, communicating by actions and word the values that drive them to serve others before themselves. As teachers, they are expected to have a vision to serve a diverse student population and provide them with the opportunities to be successful individuals.

> I will instruct you and teach you the way you should go (Psalm 32:8)

**Teaching** is developing the capabilities of the individual. All individuals are valued as God’s special creation and as a result are valued for who they are and what they can become. Effective teaching is a thoughtful process that reflects on past performance and informs future practice. The teacher balances the science of pedagogy with the art of addressing the individual need of each student through differentiated instruction. Teachers establish a collaborative classroom environment where success of other students is as important as a student’s personal success. The effective teacher creates a warm, nurturing environment with high expectations, fairness, and compassion. Students are active and engaged in learning that fosters collaboration with other students in the classroom.

The SALT theme begins the conceptual framework to clarify what now exists in the unit as well as to establish a standard of excellence for ongoing program development and improvement.

The Nyack College School of Education SALT philosophy drives all of the School of Education’s corporate and individual preparation of teacher candidates. I believe the School of Education has demonstrated that a unit can enhance, rather than distract from curriculum objectives by seamlessly connecting or linking Biblical principles into our lessons. How would a secular accreditation organization, which had the authority to approve or disapprove a distinctively Christian institution based on Biblical principles and faith integration evaluate the Nyack School of Education?
Much discussion was conducted among School of Education faculty, prior to the NCATE visitation. Would NCATE, a secular organization fail our program because of its Christian distinctives? Some faculty suggested that we secularize our NCATE preparation documents and comments. No! We would proudly display our faith in all aspects of our written documents and personal comments. The results were spectacular! The visiting team raved about the loving Godly, family relationship between faculty and teacher candidates—true evidence of an unashamedly Biblically based institution. The visiting team said they envied us for Teaching Christianly.

Closing Remarks

This brief paper has attempted to define and support the concepts of Faith Integration and Teaching Christianly as distinctives of the Christian educator. This was further defined as being an integration of Biblical truth and secular educational theory as viewed and filtered through the lens of scripture. The author has supported his position by referencing Christian authors, scripture, and providing actual examples of application of this philosophy.

In addition to a description of a lesson, which provided a graphic example of faith integration the paper concluded with the Nyack College School of Education’s SALT model, which applied the concept of faith integration to an entire educational unit, not just individual teachers and courses.

The SALT model was praised and commended and the Nyack College School of Education was accredited unconditionally by NCATE, a secular organization, substantiating the viability and quality of faith based education, even in the eyes of non-Christian organization.

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