Left-Handedness: Are Some Teaching Styles Inhibiting their Learning?

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Abstract

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Five left-handed, seventh grade science students enrolled in a small rural school setting were the study's participants. Each participant experienced four different teaching methods throughout the year. The different teaching methods were used to determine what helped the left-hander learn. It was found that the left-handed students felt they learned best through hands-on and visual teaching methods. These teaching methods could be utilized by teachers to help all the students in a classroom become successful.
This work is dedicated to my family who were always supportive in my endeavor to complete this Master’s Project. It is also dedicated to my seventh grade class of 2001 who seemed to be even more interested in this project than me.
Acknowledgments

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Chapter I: Introduction

Statement of the Problem

The purpose of this study was to explore different teaching methods for working with the left-handed student. Today's educational system seems to concentrate only on the world of the right-hander and does not seem to be aware of how the mind of the left-handed student works. The research question that needs to be answered is: Do certain teaching methods make it harder for the left-hander to learn? Many believe that a left-hander uses his right brain in remembering and carrying out tasks. But we, as educators, tend to teach to the left-brain person by teaching logic skills, linguistics and step-by-step processes. Therefore we need to broaden our teaching methods to include lessons that stimulate both the left and right brain thinkers.

Justification

Currently, there is little adjustment given by teachers to the left-handed students in their classroom. Through research, it has been shown that many left-handed people think and formulate ideas differently than right-handers. Since
about 92% of the world's population is right handed, teachers tend to direct their teaching methods to the majority of their students (Kelly, 1996). The researcher intended to study different teaching methods to see if teachers could be inhibiting left-handers learning. This will be done by teaching lessons using four different teaching methods. At the end of each lesson, a survey was given to each participant to fill out. The participant will rate the how well he/she learned from that particular teaching method.

**Definition of Terms**

For the purpose of this study, a left-hander is a person who uses his left hand for writing.

Teaching styles are different ways a teacher uses to teach a lesson to the students. The following are the types of teaching methods used in this study.

1. **Lecture** - standing before the class and giving a speech of the lesson being studied.

2. **Hands-on** - teaching a lesson by doing a variety of different projects using the hands to build, experiment, feel, etc.

3. **Student led** - allowing the student to teach the class a lesson by being creative. Example: role playing, drawing, demonstrating, etc.

4. **Visual** - using pictures to visualize the concepts of the lesson being taught instead of words.
Limitations and Appropriate Use of Results

This study was born out of a concern for my six-year old son. He is a left-hander who is having problems writing in his first grade classroom. He was getting notes sent home because he did not make his letters from top to bottom but from bottom to top. When I received his papers, the letters looked correct to me. Because I was not there to see how he made the letters, I did not know they were wrong. I then started to wonder why it really mattered how the letters were formed as long as they looked correct and were readable. I did some research on left-handers and found out that if they make their letters from bottom to top they can see what they have written. From there, I discovered many different studies were done on left-handers that were very interesting. One particular study that was done many times had to do with how the left-hander processed information. This is the topic study that I decided to pursue. The data for this study was collected from five seventh grade Life Science students in the form of several surveys.

The students are enrolled in a very small, rural school in Northwest Ohio. There were approximately 75 pupils per grade. The research was done over a period of five months at the end of the school year. If this study was conducted in another place at another time the same results may not be achieved.
A handicap is being overlooked in our schools today; that handicap being the left-handed student. To many, the left-hander seems to get along fine with no complications at all but to talk to a left-hander would provide an entirely different story. Many left-handers think differently and need to work harder to comprehend and survive in the classroom. They have learned to survive and cope in the right-handed world but is the educational system servicing them like it should? Teachers need to be aware of the way a left-handed student thinks and learns in the classroom so he/she can adequately use teaching methods that will communicate to all students in the classroom (Coren, 1992).

There are many different theories and trends on how a left and right-handed person thinks and how to communicate with each. Most of the theories have to do with brain lateralization. This is dividing the brain into two sides. In looking at the brain this way, research investigations have been able to determine which side is more dominant or carries out the persons’ functions. Based on this, teachers can put teaching methods into practice to work both sides of the brain instead of just one side (Springer, 1987).
The review of literature showed that many experts believe the way a left-hander thinks is with the right side of the brain. It also showed the way a left-hander should be taught in order to make the most of the learning processes. He should be taught by using pictures, acting out, and by hands-on activities.

**The Human Brain**

The structure of the brain is the same in all people as far as how it is put together. There are two sides to the brain; which are called hemispheres. There are the right and left hemispheres. Each hemisphere controls a side of the body. The left hemisphere controls the right side of the body and the right hemisphere controls the left side of the body. Each hemisphere also has certain tasks for which it maintains control (Springer 1987). According to Evelyn B. Kelly (1996), the right hemisphere controls synthesis, dreams, fantasies, art, music, and feelings and the left hemisphere controls language, science, math, and logic. There is also a corpus callosum that is located between the two hemispheres. These are the nerves that connect the right and left hemispheres together (Fincher, 1977). Sally Springer (1987) believes that to think wholly we need to use both sides of the brain and not just one side. Each hemisphere does its main job but is in need of the other to put the final pieces together.

Jack Fincher (1977) reported on a study that was done on people who for some reason, had to have the corpus callosum severed. This is the line that runs down the middle of the brain. It divides the brain into the left and right-
hemispheres. This did not allow the two hemispheres to communicate with each other at all. This study then proved that each hemisphere controlled certain functions of the body but each hemisphere could not completely finish the task without the other half intervening and helping out (p. 129).

An example of this is would be if a person who has had their corpus callosum severed is given an object to identify with their left hand (without seeing it) he cannot do it. Given the same test with the right hand, the person can readily identify the object. If the same test were done on a person with the brain totally intact, it wouldn’t matter which hand had to identify the object because the two hemispheres would communicate with each other to come to a conclusion (Blakeslee, 1980).

This is the main emphasis on how the human brain works. There are two hemispheres that control certain task but the hemispheres do communicate with each other to complete the tasks. There is definitely a dominant hemisphere in each person and that is important to know when trying to educate all students whether they are right or left brained thinkers (Neiman, 1980).

The left-hander

The left-hander is truly in the minority around the world. About 8% of the total population is left-handed (Kelly, 1996). The world is totally geared for the right-handed person. Not only is all the equipment used in everyday life made for
the right-hander but so is our thinking, learning and teaching processes (Kelly, 1996).

There are many problems that the left-hander encounters on a daily basis in our school systems. Little thought, however, is given to these problems because the lefty seems to learn to deal with it and doesn't complain. Some of the most obvious problems are with using a pencil sharpener, desk, and/or spiral notebooks. Some other problems deal with writing and reading left to right, and taking timed tests (Weber, 1992). Some of these problems have been overcome by just finding equipment that is made for the left-hander.

As mentioned earlier, if a child is left-handed his dominant hemisphere is the right. This would mean that art, music, feelings, and dreams control most of his actions and thought processes (Neiman, 1980). He sees the big picture and is not bothered by little details. Even though the school system has made some changes, it still tends to teach in steps, logically and linguistically. This is good for the right-handed student because this is the way he thinks but not for the left-handed student. The teaching styles of today will no longer satisfy all the students of the classroom (Coren, 1992).

**Teaching methods of today**

The teaching methods of today's educators are those of a right-handed world. Stanley Coren (1992) proved this when he asked several professors how they taught their student teachers to teach the left-handed student to write. None
of them could give an answer that was any different than that of the right-hander. As stated by Coren, “Here again we have a problem of invisibility” (p. 273).

Reading and writing are two of the biggest problems faced by the left-hander. A left-hander’s natural tendency is to do these things from right to left across the page. Therefore, a left-hander would be able to read and write much better if he could move his eyes and hands across the page from right to left. The left to right progression of hand eye coordination is one of the first signs of reading readiness (Kelly, 1996). Sometimes the left-hander is not quite ready for this natural progression at the same age as his right-hand counterpart. Of course, allowing the left-hander to read and write from the right side of the page would not be feasible in today’s world. There must be some form of continuity among all humans (left to right) in the way we read (Kelly, 1996).

The teaching methods of today’s educators are to memorize well defined verbal facts, read and write about the facts that are logical so there is no dreaming or intuition put into the thought process and step-by-step learning (Blakeslee, 1980). If the concept is broken down into little steps, naturally it will be easier to memorize and spit back out when needed. Research finds that there needs to be some new and inventive ways to teach children so that all students are using both hemispheres of the brain (Coren, 1996). The research says that by continuing on this same path of traditional learning styles, the left-hander is being set up for failure. Teachers are taught how to adjust to all types of special
needs students in their room, except the left-hander (Coren, 1996). Coren (1996) says that that when left-handers fail they are ignored and left to struggle on their own. Coren (1996) also says that left-handers are given lower grades for sloppy handwriting. This same treatment also happens in art when grades are lowered because their work isn’t neat enough because they can’t manipulate the instruments correctly (Coren, 1996). If new teaching strategies are used, then the world will end up with a well-rounded child that could use both sides of the brain and the left-hander wouldn’t feel left out.

**Teaching methods for the left-hander**

Seeing that the left-handed student is right brain dominant, then the teaching styles should reflect this. As stated earlier, a person who is right brain dominant would like lessons presented as the whole and not in parts (Kelly, 1996).

Blakeslee (1980) feels it is much easier to identify the problem that left-handers have than it is to actually fix the problem. After years of thinking from the left hemisphere, it isn’t easy to change this thought and become thinkers from both hemispheres. It’s easy to say change but changing ones thought process is the hard part. This change can only come when the teachers themselves decide to change.

Blakeslee (1980) has given a few examples of teaching styles that will get the students and teachers to start using the right hemisphere of the brain.
The first teaching method would be to allow the student to be creative. This could be done by role playing, drawing, story telling, and/or developing some type of demonstration.

A second teaching method to try is to teach a lesson from the nonverbal mind. This would respect nonverbal thinking and intuition. The teacher would try to avoid words and formulas and would use gestures and pictures to communicate the lesson. If a teacher generally uses images when thinking this kind of strategy should be easy.

Another strategy would be the hands-on approach. Many science programs are set up this way. To teach students about magnetic fields, the teacher can give each group of students a magnet and different items to be tested. The students then need to figure out which items the magnet will pick up and which it will not. The teacher can also allow the students to decide which items to try.

The last teaching method is that of creative problem solving. This would allow the child to make a nonverbal discovery and then verbalize his findings. When a student learns a concept by creative problem solving, he has internalized the concept and made a deeper understanding of the lesson than just memorizing the facts. An example of this would be teaching the area of a rectangle. The teacher can take a rectangle and divide it into smaller equal
squares. Give the paper to the student. Have the student count the small rectangles to give the area of the big rectangle. Now have the student decide what the formula for finding the area of a rectangle would be (length \( \times \) width). The student would use his problem solving skills to find out that if he counts the number of squares across the bottom and multiplies them by the number of squares down the side he will come up with the formula.

All of these strategies are incorporating the use of the right brain for learning. This will not only help the left-hander become a better student in school but it will also help the right-hander become a more well rounded citizen. It also helps everyone become a problem solver.

**Conclusion**

For the younger student, just giving him the correct equipment and modeling using the left hand would help him achieve at a higher level in the classroom. (Stainthorp, 1994). For the older student, the teacher needs to rethink his teaching style. As mentioned before, the left-hander needs to be given teaching methods to stimulate the right hemisphere of the brain. A left-hander is right brain dominant and therefore, does not think the same way as most of the world. If only 8% of the world's population is left-handed then it is easy to see why the world has become a world for the right-hander. The only way to help the
left-handed student become more comfortable in the education system is to consider how he thinks and learns. This thinking and learning comes from the dominant hemisphere of the brain, the right hemisphere. This right brain thinking is based on feeling, creativity, and intuition. If this type of teaching is never taught in the schools, then how is the left-handed student expected to achieve to his ability.

The research has shown insight into a problem that is so often ignored or just not realized that it is out there. The problem being that a left-handed person needs some other types of teaching styles than the common ones that have been used for years. Studies prove that many of the failures of left-handers can be solved with just a little action on the part of the people instructing them. The only solution to fixing the problem is acting on the problem. Coren states that “The great knowledge of life is not knowledge but action” (Coren, p.275).
Chapter III: Methods and Procedures

The aim of this project was to examine the best teaching strategies for left-handed students. Up to this point, teacher observations led to the belief that left-handers are more successful when varied teaching methods are used as opposed to taking notes and memorizing. These observations led to changes in the classroom to enable all students to achieve and be successful. Thus, the study was designed to answer the following question: Does certain teaching methods make it harder for the left-hander to learn?

Participants

Five seventh grade science students participated in this study. This seems like a small number but only 8% of the world’s population is left-handed so 5 out of 74 students comes out to about 7%. All five students were enrolled in seventh grade life science in a small rural school in the Midwest United States. Three were females and two were males.

Instruments/Protocols

Three instruments were used to collect data. These were an observational journal, student surveys and test data.
Observational Journal

The journal was used by the teacher to observe the left-handed students in the classroom. Notes were recorded in the journal two to three times per week. The notes were brief and at times may have pertained to the observation of one student and not all five. The journal was kept in a spiral notebook. When the teacher noticed some frustration on the part of the left-handed student toward the lesson a recording of that was made in the journal. Some of these observations were body posture that grew tense, facial expressions that showed some frustration and/or confusion and/or verbal cues. Other notations in the journal were times homework was not completed on time, in class work that took longer than other classmates, and/or work not completed correctly.

Initial Survey

There was a total of five surveys that were administered to the students. On an initial survey, done in the early part of September, general experiences about being left-handed and reaction to different teaching methods were sought from the left-handed students. One sample question was: “Being left handed can be considered a handicap, tell me some ways that it has been a handicap for you in school.” See Appendix B, p 39, for a copy of the instrument. Another sample question was: Does it seem to you that using a computer for writing purposes instead of paper and pencil would be easier? Why? This was done because
research shows that writing can be a big draw back for the left-handed student. The students responded to these questions in short answer format.

**Teaching Method Survey**

The intent of these surveys was to determine which teaching method was the easiest for the left-hander to understand and recall information. See Appendix C, p 40 for a copy of the surveys.

An example of a question about teaching methods was: Did this method of teaching make it easy for you to remember the information learned in the chapter? The students indicated their responses on a five point Likert scale. On this scale 5 represented always, 4 represented usually, 3 represented no change, 2 represented not often, 1 represented never. There were four surveys that sought students' responses to different teaching methods. Each survey was administered following a lesson using a particular method. The four methods used were lecture, hands-on, student-led, and visual.

In the lecture, the teacher just stood in front of the class and gave the information verbally while the students wrote notes on what the teacher was saying.

The hands-on teaching method included several science labs to demonstrate the material in the book. One lab was to put blue food coloring in a beaker of water to see how long it took for the entire beaker of water to turn blue.
This demonstrated diffusion; how a more concentrated area moved to a less concentrated area until they became equal.

The student led method of teaching allowed the students to teach the chapter. They were assigned a section of the chapter to present to the class.

The last method was visual. The material in the chapter was presented through pictures. One example of this was mitosis. Learning about mitosis happened by looking at, drawing pictures of, and making models of the whole process.

Testing

Testing was also used as a data source. Content tests were administered after each chapter. Each chapter was taught using a different teaching method and then the tests were compared to determine how much knowledge was retained from each lesson and to determine if the teaching method made a difference in student learning.

Procedures

First a letter was sent home at the beginning of school to each parent of the left-handed students to let them know that their child would be part of a research project. See Appendix A, p 38 for a copy of this letter. The letters had to be signed and brought back to make sure the parent had seen the letter. The principal gave verbal permission to conduct the action research project.
Observational Journal

A small spiral notebook was kept by the teacher to briefly jot down notes observed from the left-handed student. Notes were written in the journal two to three times per week and dated. Anything the teacher saw that appeared to show some frustration or confusion by the student about the lesson was put in the journal.

Student Surveys

In early September, a survey was given to the left-handed students to gather some general experiences about being left-handed and reactions to different teaching methods. The survey was given to each left-handed student at the end of class. See Appendix B, p 39 for a copy of the survey. They were to be given back to the teacher within two days. They could either be returned to the homework pile on the teacher’s desk or put in the teacher’s mailbox. The surveys were to remain anonymous.

The students were taught using the lecture, hands-on, visual, and student led methods of teaching. At the end of each chapter, the students were given a test over the material. The test grades were recorded and saved to use as a comparison when the study was done. The students were then given a survey using a Lickert scale for response. See Appendix C, p 40 for a copy of the survey. The surveys were to be returned within two days to the teacher’s
mailbox. The surveys were to remain anonymous. The teacher then compiled the surveys and made a graph of each survey.

**Testing**

Tests, developed by the teacher, were administered after each chapter to see if the different learning methods made a difference in how much knowledge was attained. The test scores were recorded and compared to each other. The grades were analyzed to see which teaching method yielded the highest grades. The test scores for each participant were compared to determine which teaching method seemed to influence learning.

**Time line**

In September, a letter was sent home to the parents of children participating in the study. See Appendix A, p 38 for a copy of the letter. This was done after permission from the principal was granted.

**Observational Journal**

A journal was started in September and continued through the end of March to observe the left-hander in a normal school classroom. Notes were taken approximately two to three times a week.

**Initial Survey**

The Initial Survey to determine overall attitudes about being left-handed was given at the beginning of September. See Appendix B, p39 for a copy of this
survey. This survey was to get an idea of what the left-handed student thought of being left-handed. These surveys were returned within two days.

**Teaching Method Survey**

The surveys were distributed at the end of each chapter and returned within two days to the teacher. See Appendix C, p 40 for a copy of these surveys. The study of each teaching method was started in the beginning of January. Each chapter took approximately two to three weeks from beginning to the final test. The surveys were handed out after the test was taken and returned within two days. The teacher then put the surveys away to be analyzed when the final set of surveys were returned. The teacher then analyzed all four surveys at the same time. The surveys were compared to each other and graphs were made to show how the left-handed children responded to the teaching methods.

**Testing**

Tests were administered at the end of each chapter and were specific to the content in that chapter. The tests were given at the end of January, middle and end of February, and the middle of March. The tests scores were recorded and used at the end of March to determine the results.

**Data Analysis**

The purpose of this study was to explore different teaching methods for working with the left-handed student. Four methods were used to obtain
information to answer the question about which teaching method was most conducive to the left-handed students’ learning. These were lecture, hands-on, student led, and visual.

Journal

A journal was kept for the duration of the study to note the responses of left-handed students. The journal was read to see if any of the same themes kept reoccurring throughout the time the study was happening. There were two themes that kept reoccurring throughout the journal. They were students were learning and not learning the science content/process being taught and behavior that were and were not conducive with the research literature on left-handed learners. The journal was then analyzed again and those entries that fit into one of these two themes were highlighted. The highlighted entries were then put into the different categories: entries that showed students understood the content/process, entries that showed students did not understand the content/process, and entries that showed students’ behavior consistent with research literature, and entries that showed students’ behavior was not consistent with the research literature. All the items in each category were counted and graph made to show which category appeared the most.
Initial Survey

To analyze the initial survey, responses were reviewed for likenesses and differences in the responses. Therefore, all the answers from each participant for the first question were compared to each other. The researcher was looking to see if any of the left-handers had different answers to the question one.

For question two, a graph was made to show the responses to the question. The data was reviewed to determine how many students answered with a "yes," "no," "or "does not matter," response. The reasons that the left-handed students said they responded as they did were then compiled in a list. Responses were compiled by likenesses.

In question three, the left-handed students had to rank, in preference, the four teaching methods from favorite to least favorite. The data for each method was compiled and graphed.

Teaching Method Survey

The teaching method survey was distributed to the students after each type of method was used. Each survey was identical except that it pertained to a different teaching method. After the administration of the last survey, all surveys were analyzed to determine what method the student's felt helped them learn best.
To do this, all answers to each question were compared and a graph developed to display the results and to determine which method was perceived as most effective by the students.

Testing

A test was given at the end of each chapter. Each chapter was taught using a different teaching method. After the last test, all the scores on each test were averaged and those averages compared and graphed. This was done to see which teaching method the left-handed student performed the best using.

All of these instruments were used to determine what would allow a left-handed student to learn best. The results of these instruments are found in the following chapter.
Chapter IV: Results

The purpose of this study was to inquire into the way left-handers learn best. The majority of the human population is right handed and assumes that everyone processes information the same. Four different types of teaching methods were used to try and assess how left-handers learned best.

Journal

A journal was kept throughout the study to record notes on behavior observed from the left-handed students. Four categories were very prominent throughout the journal. The categories were “Students that understood the content/process,” “Students who did not understand the content/process,” “Students' behavior that was consistent with the research literature,” and “Those students whose behavior was not consistent with the research literature.” Figure 1 shows how many journal entries appeared in each category.
Figure 1: Number of each category of journal entry.

The graph shows that most of the journal entries agreed with the research literature that most students learn better using hands-on teaching methods. It also showed that the same number of entries were for “students understanding content/process” and “agreed with research”. Both of these categories appeared more frequently, therefore it seemed as though the left-handed students were benefiting from different teaching methods.

Initial Survey

An initial survey was given prior to the study to determine student views on learning and being left-handed. The first question stated “Being left-handed can be considered a handicap, tell me some ways that it has been a handicap for you in school. The answers received to this question were: “It is hard to write,
especially on the chalkboard," "There are no left-handed desk which makes it hard to write," "Sharpening a pencil is sometimes hard because the crank is on the wrong side," and "Writing neat is hard to do. I hate being graded on my writing."

The second question was “Does it seem to you that using a computer for writing purposes instead of paper and pencil would make writing easier? Why/Why not?” Two students answered “yes”, two students said “no”, and one student thought “it would not matter.” The “yes” students thought it would be easier because they do not write very well. The two students that said “no” both said that they did not know how to type and therefore it would take way too long to type than to write.

The third question on the survey asked students to rank four teaching methods in order from their favorite to their least favorite. A number 1 was used for the favorite teaching method and a number 4 was used for the least favorite teaching method. The results of this question are in Figure 2 that follows.
<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Hands-on</th>
<th>Student led</th>
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<td>3</td>
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<tr>
<td>Student 5</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>1</td>
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</tbody>
</table>

*Figure 2*: Ranking of teaching methods by left-handed students.

The results of the data show that a majority of the students liked the hands-on teaching method best and the lecture teaching method the least. This data is consistent with the research literature that says the hands-on teaching method is best for learning.

**Teaching Method Survey**

There were four teaching method surveys distributed to each left-handed student over the course of the study. The surveys were all exactly the same except that they pertained to a different teaching method. The students used a Likert scale to rate each method. The scoring was as follows: 1 - always, 2 - sometimes, 3 - same; did not change, 4 - hardly ever, and 5 - never. The results were then compiled to determine if left-handers truly learn better from a particular teaching method.
Question one asked; “How hard was it to grasp the concepts using this method?” The results showed that on the lecture, hands-on, and visual teaching methods four out of the five students felt that it was never hard to grasp the concepts. On the student led method of teaching, four of the left-handed students thought it was usually harder to grasp the concepts. Figure 3 displays the results of question one.

![Figure 3](image)

**Figure 3.** Left-handed student ranking for “How hard was it to grasp concepts.”

This data showed that left-handed students perceived that they learned better through the visual and hands-on teaching methods. The hands-on and visual teaching methods aligned with the research that stated left-handed students used the right side of the brain to process and learn (Kelley 1996).
The second question asked “Do you like this method of teaching?” In the visual teaching method, four students said they “always” liked this way of teaching. Four left-handed students chose “usually” when asked if they liked “hands-on. Figure 4 shows the results of question two.

![Figure 4: Summary of student rankings for “Do you like this teaching method.”](image)

The results of this graph showed yet again that the data is consistent with the research literature. The right-hemisphere of the brain is stimulated with this type of teaching method and therefore the left-handed student feels more able to succeed with this type of teaching (Kelley 1996).

The third question asked; “Were your test results better using this method?” A majority of the left-handed students rated all four teaching methods by indicating there was no change in their test grades. Figure 5 shows the results of question number three.
Even though the other questions showed that the left-handed students liked to have the visual and hands-on teaching methods used, the test scores did not show a difference by teaching method. All the left-handed students felt the same on whether their scores improved.

Question four asked "Did you have to study more to remember the content in this chapter?" Four out of the five students ranked student led teaching method as one which means they always had to study more to remember the content. In contrast to that, the visual teaching method had four out of five left-handed students say they never had to study more with this method. Figure 6 shows the results of question four.
The information in Figure 6 showed consistency with the research literature that stated a left-handed student is right brain dominant. By the left-handed student saying that he did not have to study more using the visual teaching method, this means that feelings, art, music, and dreams control most of his actions and thought processes (Neiman, 1980).

The final question asked “Would you use this teaching method again?” Four out of five of the left-handed students clearly showed that they would “always” like the hands-on method. In contrast to this, four out of five students indicated that they would not often choose the student led method. Figure 7 displays the results of question five.
The data in Figure 7 confirmed that left-handed students preferred to be taught if they could touch and see the concepts of the lesson.

Testing

Content tests were given at the end of each teaching method. The scores for the test after each teaching method were averaged to see if one method helped the left-handed student retain more information than another method. The results were then put on the following graph.
Figure 8: Average Test Scores

All the test scores were approximately the same on all teaching methods. Testing results did not show which method influenced students' learning. The students may have retained more information with one method and not had to study as much. With another method the left-handed student may have had to study more to get a good grade on the test.
Chapter V: Discussion

The purpose of this study was to explore different teaching methods for working with left-handed students. Would one teaching method allow the left-handed student to learn better? Do teaching methods really matter? The problem was that most teaching methods seem to require the left-handed students to process information using the left hemisphere of the brain. A left-handed person uses the right-hemisphere of the brain to process information. Therefore, if a teaching method stimulated the right side of the brain, a student that is left-handed may be able to learn better. In order to determine if this hypothesis was true, a study was done on left-handed students to see if one teaching method served to be better for the left-handed students than another.

Discussion

While the results of the study proved that the left-handed student did do better when taught using the visual and hands-on methods of teaching, it also showed the same results with the lecture type method of teaching. The visual and hands-on methods of teaching required the student to use the right hemisphere of the brain while the lecture method required use of the left hemisphere. The only teaching method that the left-handed students did not do well with was the student led teaching style. The left-handed students preferred to use the lecture method of teaching because that is the method with which they
are most familiar. They can learn and do well with this method of teaching because it is the method they use most often.

This group of left-handed students did very well on tests using all methods of teaching because they were an exceptional group of achieving left-handers. They could have been presented with any kind of teaching method and succeeded.

The left-handed students did not like the student led teaching style because they had to do much more work themselves. They also had to decide what information was important and if the presenters omitted information from their presentations. The basic problem here was the students did not want to do all that work.

Another finding that was not discussed else where in the paper was that not only did the left-handed students benefit from a wide range of teaching methods but so did the right-handers. Just by varying teaching methods, it kept the students interested in their studies and they liked class better.

The results, therefore, did prove that students can and will do better if they are presented with many different teaching methods

Summary

This study investigated four different teaching methods to determine if left-handed students could perform better with one certain method over another. Five left-handed students participated in this study. The data was collected from
a and then compiled to see if one teaching method proved better than another. According to research, a left-handed student should do better if the right side of his brain is stimulated. If this is true, the hands-on and visual methods of teaching should have been conducive to better learning. According to the survey results, the left-handed students did indeed enjoy these two methods of teaching better than any others but their test grades remained close to the same on each test for all four methods of teaching.

**Recommendations**

Should a similar research be conducted, the following suggestions should be implemented. The first suggestion would be to have a larger group of left-handers to work with. Even though only 8% of the population is left-handed, a larger group would give better results.

A second suggestion would be to try and teach the same chapter using the four different teaching methods. This would give more accurate results because in some cases different chapters may be easier or more interesting than others.

Another change would be to include many different age levels instead of just one. Many people learn and think differently at different stages in life.

The final change would be to research other problems that left-handed students have with learning besides teaching methods. There are many
problems with tools alone; such as desk, notebooks, pencil sharpeners and many others.

The relationship between teaching methods and the left-handed student's learning should be important to teachers.

In conclusion, using a more interactive teaching method is more enjoyable to the students in the classroom instead of the traditional lecture style of teaching. Students seem to remember more if more of their senses are involved in the learning process instead of just one or two. Left-handed students like to be taught using a hands-on approach more often than any other.
References


Handedness. (on-line). [http://www.nurse.minerva.co.uk/handedne.htm](http://www.nurse.minerva.co.uk/handedne.htm)


Appendix A

Nancy Miller Ayersville Schools
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Defiance, Ohio 43512

September 2000

Dear Parent

I am taking course work at The Defiance College to complete my master's degree. In order to finish, I need to do a research project. My project is to study how a left-handed student responds to different teaching methods. Because you have a left-handed student, I will be observing your child in my classroom. Your child will also have some surveys to fill out on how he/she liked certain teaching methods to help me determine which teaching method is best for learning. Thank you for your understanding and if you would like any further information please feel free to contact me.

Thank you

Nancy Miller
Science Teacher
Appendix B

Initial Survey

1. Being left-handed can be considered a handicap, tell me some ways that it has been a handicap for you in school.

2. Does it seem to you that using a computer for writing purposes instead of paper and pencil would be easier? Why?

3. Rank the following teaching methods in order from your favorite (1) to your least favorite (4).

- Lecture – take notes while teacher talks
- Hands-on – experiments and doing things with hands
- Student-led – students doing the lesson and teaching the class
- Visual – learning through the use of pictures
Appendix C

Teaching Method Survey

Think about the teaching method that was just used in the last chapter and answer the following questions. Use a scale of 1 –5 to rate each question.

1= always
2 = sometimes
3 = same; no change
4 = hardly ever
5 = never

1. How hard was it to grasp the concepts in this chapter using this teaching method?
   1  2  3  4  5

2. Do you like this method of teaching?
   1  2  3  4  5

3. Were your test results better using this method of teaching?
   1  2  3  4  5

4. Did you have to study more using this method to remember the content?
   1  2  3  4  5

5. Would you use this teaching method again?
   1  2  3  4  5