Connecting Theory to Practice: Evaluating a Brain-based Writing Curriculum

Dale T. Griffee
Texas Tech University

Abstract

This 10 week longitudinal evaluation study evaluated a brain-based learning curriculum proposed by Smilkstein (2003) by comparing student performance in a traditional basic writing curriculum with NHLP-oriented basic writing curriculum. The study included two classes each of experimental and traditional methods. Results of the data, gathered by means of questionnaires and in-class writing, indicate the experimental classes expressed more positive comments than the traditional classes, and, on an enjoyment scale, tended to score higher mean Likert scores; but low N-size inhibited statistical testing and weakens the claim. However, scores for the final writing were statistically significantly higher for experimental students.

Connecting theory to practice is considered a helpful and necessary component of successful developmental education programs (Boylan, 2002; Casazza, 2003; Casazza & Silverman, 1996; Chung, 2005). Theory not only provides an explanation for practice but enables reflection and thus development (Griffee & Gorsuch, 1999). However, as Saxon and Boylan (2003) point out, theories need to be empirically investigated to determine which hold promise. Brain-based learning theory and its resulting curriculum, as discussed by Smilkstein (2003), provide one theory currently of interest.

Background

Smilkstein (2003) referred to her work in learning theory as Natural Human Learning Process (NHLP), which included five assumptions. First, the brain is conceived as an organ that actively constructs knowledge. Second, teaching means giving students the opportunity to actively learn. Third, if students fail to comprehend and apply knowledge, it is because they need additional background and preparation, not because they lack the ability to understand the material. Fourth, the pedagogical sequence is "the teacher should first give students opportunities to be active learners; then the

teacher, if necessary, can add to what the students have discovered on their own by giving a lecture, definitions, background, technical terms, explanations, examples, demonstrations, and so forth" (Smilkstein, p. 4). Fifth, learning is pleasant when students have had a chance to actively learn, as compared to a more traditional understanding that asserts learning is pleasant when the teacher is pleasant and the material is entertaining.

Working within the tradition of second language acquisition, Ellis (1998) discussed task evaluation and proposed a three-part evaluation model: student-based, response-based, and learning-based evaluation. Student-based evaluation gathers data about student opinion, response-based evaluation gathers data on the extent learning took place with students doing exercises under direct instructor supervision, and learning-based evaluation gathers data on the extent to which learning took place without direct instructor supervision. This evaluation model provides multiple evaluation paths that can result in a more complete view than any single view can provide.

Research Questions

The purpose of this 10-week longitudinal evaluation study was to evaluate a brain-based learning curriculum by comparing the performance of students in a traditional basic writing curriculum with those in an NHLP-oriented basic writing curriculum. Three research questions were developed, one each from student-based evaluation, response-based evaluation, and learning-based evaluation:

1. From a student-based perspective, did students in the NHLP classes find the curriculum more enjoyable than students participating in the traditional curriculum? If Smilkstein is correct that learning is pleasant when students have a chance to learn actively, this study should indicate students in the NHLP classes expressed more enjoyment than by students in the traditional classes.

2. From a response-based perspective, will students from NHLP classes complete their writing assignments and receive higher cumulative scores than students in traditional classes? If students are actively involved in their own learning and writing, this study should reflect those students will take more responsibility for their assignments, complete them on time, and thus obtain higher total scores than students in a traditional writing curriculum.

3. From a learning-based perspective, does an NHLP curriculum result in equal or better student writing scores than scores from a more traditional curriculum over one semester? If students in a NHLP-oriented curriculum are actively constructing knowledge, the resulting writing scores would be at least equal or, perhaps, surpass the writing scores of students in a more traditional curriculum.

Description of Smilkstein Model as used in this study

According to Lalicker (2001), traditional basic writing curriculum is defined as a below college-level, not full-credit course for writing at the paragraph level designed to prepare students for academic discourse, typically using lectures and grammar exercises. According to Smilkstein (2003), NHLP basic writing curriculum is defined as the same as the traditional curriculum with

the following modifications: All writing is evaluated using a midterm assessment and is introduced using an NHLP writing workshop format. The NHLP format used in this study consisted of four parts, with each part having three stages.

In part one, students worked individually and wrote down what they did during the 30 minutes before class. In the second stage, students worked in pairs or small groups and read their narratives to each other. The third stage consisted of looking at the similarities and arriving at a definition of a narrative with the instructor writing all contributions on the board without comment.

In part two, students again worked individually and wrote from when class started to 30 minutes before class started. For example, students would write sentences similar to "I sat down in my seat; just before that, I came into the room." In the second stage, students worked in small groups and read their narratives to each other; they were encouraged to change their definition if they thought it could be improved. Students were also asked to identify words or phrases they wrote that showed movement in time going forward or backward. Finally, with the instructor writing the transition words on the board, students worked as a whole class to report changes in their definition of narrative and what words or phrases they used to show movement in time.

In part three, students were given a handout of an example narrative text by the instructor and asked to individually to write notes about the author's time sequence and the use of transitions. In stage two, students worded in small groups and shared discussed their notes. In stage three, students working as a whole class were asked to write their findings on the board. The instructor lectured points as seemed appropriate.

In part four, students were assigned as homework to write a narrative of their own choice based on their experiences using transitions to help readers follow the movement through time backwards and/or forwards.

Method

Participants

I taught four basic writing courses used in this research. Two were randomly selected for the NHLP curriculum and two for the traditional curriculum. Classes were selected so as to balance day of week and time of day. The study began with a total of 37 students, 18 in the traditional classes and 19 in the NHLP classes, and ended week 10 with a total of 23 students, 10 in the traditional classes and 13 in the NHLP classes. The average age of all students was 21; the youngest was 17 and the oldest was 29. Students in the classes using the traditional curriculum were one African-American, five Caucasian, one Hispanic, and three international students from Thailand, Viet Nam, and Cameroon. Students in the classes using the NHLP curriculum were one African-American, six Caucasian, two Hispanic, and two international students, one from Korea and one from China.

Instruments

To answer research question one, an enjoyment questionnaire was designed consisting of one open-ended item and one closed-ended item. The open-ended item was "In terms of what we actually do in class, what do you enjoy or not enjoy about our class?" The close-ended item was a Likert scale of one to six in which one and two were designated as not fun, three and four were designated as so-so, and five and six were designated as enjoyable. The item was stated as "Circle the number that best shows overall how much you enjoy this class." The questionnaire was administered after the completion of each of the four writing modules: narrative, descriptive, comparison and contrast, and persuasive. Students were instructed not to sign their name, but to fill out the form and put it on a chair near the door as they left the room.

To answer research question two, points and due dates were designated for all assignments, and a late policy was published in the syllabus that stated assignments could be handed in no more than one class late. Each student was given a point sheet, and points were entered as writing was received on a duplicate point sheet kept in the class folder. Reflective letters, response papers, brainstorms, writing plans, and first drafts were given full point credit if they were completed on time, but final drafts were graded by the instructor. Scores thus reflect to a large extent the degree to which students submitted material on time.

To answer research question three, a prompt was given to all students requiring an in-class, persuasive essay of at least one paragraph.

Data Collection and Analysis

The enjoyment questionnaires were collected, enjoy versus not enjoy comments were identified, and the number of positive comments were summed and divided by the number of students making the comments, resulting in mean frequency scores. Comments not relevant to the curriculum, such as "I don't enjoy writing," were not tabulated. Likert ratings were summed and divided by the number of students answering, which provided an average for each class. Students' points earned were entered into a computer spreadsheet on the last class day of each writing module, which resulted in four collection periods. Point totals were individually summed, and a class average was calculated.

In-class essays were collected and graded by the instructor using the grading criteria for persuasive writing as seen in Figure 1. To deal with instructor rater bias, all students were instructed to sign their composition on the back. In addition, four essays, one each from an African-American, a Caucasian, a Hispanic, and an international student were randomly selected from the NHLP classes, and three essays, one each from an African-American, a Hispanic, and an international student, were selected from the traditional classes. After rater training was conducted, these seven essays (three from men and four from women) were given to a second faculty rater to grade. Instructor scores and second rater scores were correlated, corrected for attenuation according to a formula from Brown (1996, p. 155), and reported as a reliability coefficient. This reliability coefficient demonstrates the degree to which the course instructor rated students in the traditional and NHLP curriculum classes consistently.

Grading standards for the final persuasive writing

1. Writing is within the genre. This includes four features:

♦ A topic sentence that clearly states the proposition and writer's stance toward it e.g., I think the city should pass an ordnance prohibiting smoking in public,

♦ reasons which are clearly and logically related to the proposition,

♦ evidence which supports the reason,

♦ and a conclusion.

2. Maintains paragraph unity. The paragraph must be coherent. For example, does the writing contain transitional phrases (e.g., first, second, next, on the other hand).

3. Has audience awareness. Audience awareness means the text is reader based, not writer based. Reader based text is from the reader's point of view which means the reader can understand the meaning. Writer based text is text which makes sense to the writer, but not to the reader. An example of writer based text is, "In conclusion the reason that this lesson is so important to me, is for, with in this one lesson there are many more to come."

4. Appropriate vocabulary. The vocabulary is appropriate for academic use, and is not speech-based that contains slang or conversational phrases.

5. Mechanics. Mechanics refers to fragments, run-on sentences, comma splices, or misspelled words.

Grading scale:

It's all there = 20 points.

It's mostly there = 15 points.

Some is there = 10 points.

A little is there = 5 points.

Nothing to grade = 0 points.

Figure 1. Grading standards for the final persuasive writing

Results

Research question one was addressed by the frequency of positive and negative comments as shown in Table 1 and the Likert scale ratings as shown in Table 2. As can be seen in Table 1, the NHLP classes began by making fewer positive comments than students in the traditional classes (3.80 to 6.00). After week 5, both groups seem about equal, but by the end of week 7, the NHLP classes were making more positive comments. This trend continued through week 10.

Table 1

Average Frequency of Positive and Negative Comments

Collection period	NHLP positive	Traditional positive	NHLP negative	Traditional negative
End of week 3	3.80	6.00	1.94	1.33
End of week 5	2.66	2.83	1.00	1.33
End of week 7	2.00	1.34	0.94	0.93
End of week 10	1.43	1.00	0.25	0.13

The Likert scale enjoyment ratings can be seen in Table 2. Both the NHLP classes and the traditional class scores start at about the same point, 4.59 and 4.78. At the end of week 5, the NHLP classes enjoyment ratings increased to 5.08 while the traditional class enjoyment scores decreased slightly to 4.71. By the end of week 7, both groups were the same, but by week 10, some difference reappeared. Of interest is the final standard deviation for both groups. Since standard deviation is a measure of how the scores group around the mean (Vogt, 1999), the standard deviations for week 10 indicate a higher level of agreement among students in the NHLP classes than in the traditional classes.

Table 2

Likert Scale Enjoyment Ratings

Collection period	NHLP classes		Traditional classes	
	M	SD	M	SD
End of week 3	4.59	1.42	4.78	.67
End of week 5	5.08	.90	4.71	.95
End of week 7	4.50	1.24	4.50	.93
End of week 10	5.00	.43	4.50	1.38

Research question two was addressed by students' earned points collected at the end of weeks 3, 5, 7 and 10, which can be seen in Table 3. These weeks were chosen because they were the final weeks of the four writing modules. The NHLP classes both scored writing score totals in the mid-four hundreds. One of the traditional classes also scored in the mid-four hundreds and one did not. This evidence is inconclusive and may or may not

indicate that a NHLP oriented curriculum motivates students to turn in their writing assignments.

Table 3

Cumulative Student Earned Points

Classes/Weeks	Week Three	Week Five	Week Seven	Week Ten
NHLP Classes				
MWF 9:00 am	80.1	195.0	313.4	469.2
TT ll:00am	65.3	199.0	294.0	455.0
Traditional Classes				
MWF 10:00am	53.9	215.0	331.0	479.0
TT 9:30am	73.5	154.0	261.0	321.0

Research question three was addressed by the scores from the final essay as seen in Table 4. Rater reliability corrected for attenuation was .90, indicating high consistency between the scoring of the instructor and the second rater, which indicates that the instructor who rated the essays from all students was rating the essays written by the students in the control and NHLP classes in a similar way. The NHLP mean score was 82.92, and the traditional mean score was 71.61.

Table 4

Final Writing Average Scores

	NHLP	Traditional
N	13	10
Mean	82.69	72.00
SD	8.81	13.98
Minimum	70	50
Maximum	100	90
Skewness	.17	-.37
Kurtosis	-.64	-.78

After verifying that all assumptions for a t-test had been met, results of a one-tailed $\underline{t}$-test were $\underline{t} = 2.246$, df $= 21$, p $= .0178$. Strength of association calculated using Cohen's d was .77, indicating a fairly robust finding.

Discussion

Research question one was, "Will students in the NHLP classes find the curriculum more enjoyable than students in classes using the traditional curriculum?" The answer is a tentative yes, although the evidence is not conclusive. The experimental NHLP classes expressed more positive comments than the traditional classes, and on an enjoyment scale using Likert scale ratings, they also tended to score higher mean Likert scores than the traditional classes, but because of low number of students involved, no statistical comparisons were done which weakens the claim.

Research question two was, "Will students from NHLP classes complete their writing assignments in a way so to obtain scores higher than students in traditional classes?" Again, the answer is yes; two of the NHLP classes scored higher than one of the classes in the traditional curriculum. It must be pointed out, however, that one of the classes in the traditional curriculum also scored a high number of points indicating that more variables may be involved than this paper investigated. Nevertheless, these findings may be important because it suggests that an NHLP curriculum encourages students to complete and hand in their work which is a prerequisite for student writing improvement.

Research question three was, "Does an NHLP curriculum result in equal or better student writing scores than a more traditional curriculum?" The answer is yes; the NHLP classes scored an average of ten points higher than the classes receiving the traditional lecture curriculum. To put it another way, the average score obtained on the final writing by the students experiencing the traditional curriculum was a C while the average score obtained by students experiencing the NHLP curriculum was a B. This average score difference occurred despite a drop-out rate that left only determined students in both the control and experimental classes, which resulted in a high level of one-on-one teacher to student instruction in both control and experimental classes.

What factors in the NHLP curriculum promoted more student enjoyment, generated higher performance, and increased learning? After reviewing field notes kept during the semester, two reasons suggest themselves: the workshop methodology and the midterm formative evaluation. There was no difference between the control and NHLP groups with reference to the teacher, the way students were selected for the course, the day or time of the class, the types of writing, the method of grading, or practice in mechanical drills. The workshop methodology, on the other hand, was a major difference.

Each workshop began with an individual student task that provided data for the workshop. Stage one (individual) allowed every student to participate in a concrete rather than abstract way. Considerable student resistance at stage one (whole group discussion) occurred in one class when asked for their definition of a narrative. Students wanted a "correct answer" and insisted that they did not know the definition of a narrative piece of writing. This impasse provided an instance of teacher-student interaction. The instructor insisted on an answer until one or two students offered a few phrases toward a definition. Phrases were written on the board without comment. At stage two (the whole class), additional comments were added to the definition that made it more complete.

This study suggests the bottom-up recursive stages of the workshop promoted teacher-student interaction that allowed students to construct their own understanding of the writing process. This happened to a far lesser degree in the traditional curriculum classes, which rely primarily on lectures and present students with lectures resulting in minimal interaction.

The second major difference between the control and experimental groups was the midterm evaluation conducted at the end of week seven. Smilkstein (2003) gave detailed step-by-step procedures for what she calls "student

group instructional feedback," (p. 164). This study, however, is using the more traditional term: Midterm Evaluation (ME).

A teacher colleague agreed to come into the classroom and conduct the ME. Procedures were established, and a complete class session was allocated to the ME. The colleague came into the classroom, was warmly greeted to make it clear that the instructor was not being evaluated, and then the instructor left the room. The colleague posed three questions: what works, what doesn't work, and what could be improved? Students wrote their answers individually, shared in small groups, and then the answers were written on the board. A student volunteer transcribed all the answers, and the colleague led a whole class discussion and asked if there was agreement on all the points under the three questions. This last point ensures that the answers are a class consensus rather than a collection of idiosyncratic points. The colleague collected the transcriptions and a day later gave them to the instructor along with her understanding of what happened.

In the class immediately following the midterm evaluation, the results were discussed and clarification sought of the issues raised by the transcribed answers. It was found that what worked was the brainstorming and writing plan assignments. What did not work can be grouped under four categories: student misunderstandings, unacceptable requests, idiosyncratic points, and requests concerning instruction and feedback.

An example of student misunderstanding occurred in their request for more interesting writing topics. This was a misunderstanding because the instructor never assigned writing topics but only agreed to provide students with topics if they could not come up with a topic themselves. Elimination of peer evaluation represented an unacceptable request. One idiosyncratic request slipped through the midterm evaluation. In one class, students requested more grammar lessons, but when quizzed on this point, it was found that while one student made the request and the other students agreed during the midterm evaluations the class later acknowledged they did not agree although they said so at the time. A final suggestion was a request for more feedback from the instructor and more direct instruction on writing.

For the remainder of the course, the number of required drafts was increased from two to three. Draft one underwent peer evaluation and received full points if turned in. Draft two was evaluated by the instructor and would also receive full points. Draft three was graded by the instructor based on the criteria in Figure 1. These changes met the concerns of the students, increased feedback from the instructor to all students, and allowed for more direct instruction.

Implications and Further Research

As a result of this study, I am no longer willing to present writing genre in lecture format. However, in recent graduate level classes which include ESL students, there have been requests for lectures, and I may have to decide time, form, and content of classes. Perhaps the role of lecturing and its place in classroom instruction is more complex than first imagined and future research could help.

The evidence here suggests lecture fronted instruction is not as helpful as NHLP instruction. Should lectures be eliminated in favor of various forms of class discussion? Smilkstein (2003) herself indicates that there might be a place for lectures after students have had a chance to engage in active learning. This suggests that it is the active learning which prepares students to more fully grasp the lecture content. Reversing the format of lecture-discussion to discussion-lecture could be a future research area.

Another research area for future research is the function and role of mid-term evaluation (more traditionally referred to as formative evaluation). As the results of this study show, the trend of all evaluation indexes was down until formative evaluation and the steps suggested by that evaluation were taken. Formative evaluation takes into account that teachers have blind spots and cannot see certain areas of student concern. This study strongly suggests that student input and feedback can make a valuable contribution.

Conclusion

In summary, the midterm evaluation produced formative evaluation data that allowed an "interactional" dialogue between the instructor and the classes and, in turn, resulted in curriculum changes. The midterm evaluation apparently had a rejuvenating effect on the NHLP classes as reflected in the Likert scale approval ratings in Table 2 and the cumulative score differences in Table 3. In both cases, after week seven, scores reversed their downward direction and rebounded substantially.

This empirical evaluation study comparing a brain-based writing curriculum based on Smilkstein (2003) with a traditional writing curriculum produced evidence to suggest that a brain-based curriculum is promising to composition teachers. Despite a very high drop out rate (typical for developmental education courses at this institution), the data from this study provides evidence that over a period of time, a NHLP curriculum provided higher student approval ratings, increased participation, and improved student writing scores.

References

Boylan, H. R. (2002). *What works: Research-based best practices in developmental education*. Boone, NC: Continuous Quality Improvement Network with the National Center for Developmental Education, Appalachian State University.

Brown, J. D. (1996). *Testing in language programs.* Upper Saddle River, NJ: Prentice Hall-Regents.

Casazza, M. E. (2003). Strengthening practice with theory. In N. A. Stahl & H. Boylan (Eds.), Teaching developmental reading: Historical, theoretical, and practical background readings (pp. 179-192). Boston: Bedford/St. Martin's

Casazza, M. E., & Silverman, S. L. (1996). *Learning assistance and developmental education: A guide for effective practice*. San Francisco: Jossey-Bass.

Chung, C. J. (2005). Theory, practice, and the future of developmental education. *Journal of Developmental Education, 28*(3), 2-10, 32.

Ellis, R. (1998). Evaluating and researching grammar consciousness-raising tasks. In P. Rea-Dickins & K. Germaine (Eds.), *Managing Evaluation and Innovation in Language Teaching* (pp. 220-252). Harlow, UK: Addison-Wesley Longman.

Griffee, D. T., & Gorsuch, G. J. (1999). The role of theory in ESL/EFL. *The Language Teacher, 23*(10), 35-37.

Lalicker, W. B. (2001). A basic introduction to basic writing program structures: A baseline and five alternatives. In S. Bernstein (Ed.), *Teaching developmental writing* (pp. 14-24). Boston: Bedford/St. Martin's.

Saxon, D. P., & Boylan, H. R. (2003). Where do we go from here? An agenda for developmental education research, part I. *Research in Developmental Education, 17*(4), 1 - 4.

Smilkstein, R. (2003). *We're born to learn: Using the brain's natural learning process to create today's curriculum*. Thousand Oaks, CA: Corwin Press.

Vogt, W. P. (1999). *Dictionary of statistics & methodology* (2nd ed.). Thousand Oaks, CA: Sage.