Reading Horizons

Volume 28
Issue 1 *October 1987*

Article 4

10-1-1987

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THE INTRODUCTION OF SOCIAL STUDIES VOCABULARY BY SEMANTIC FEATURE ANALYSIS: USING A MICRO-COMPUTER DATABASE PROGRAM--A DESCRIPTION

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The introduction of essential vocabulary is a matter of concern to all teachers in all content areas, including social studies. One method for introducing and developing content specific vocabulary is semantic feature analysis (Johnson & Pearson, 1978). In this regard, we present a summary of a teaching experiment in which two data management software packages, PFS:File and PFS:Report, were adapted for classroom instructional use in order to introduce vocabulary concepts using the semantic feature method. We call it a "teaching experiment" because we were uncertain as to the adaptability of these programs for the purpose of teaching semantic feature analysis. However, we found that both PFS:File and PFS:Report were easily adapted to semantic feature analysis and met with a high degree of success.

The curriculum project reported here was conducted in a sixth grade, self-contained classroom. There were 27 students in the room. At the time of the year that this study was conducted, the content of the social studies curriculum being taught was "the Countries of Europe." Therefore, vocabulary and concepts related to this topic were incorporated into the study.

SEMANTIC FEATURE ANALYSIS

Semantic feature analysis is a strategy for introducing essential vocabulary and the relationships of various vocabulary items. The theory of semantic features was introduced by Johnson and Pearson in their text Teaching Reading Vocabulary (1978). Since then, the effectiveness of this strategy has been proven in various studies conducted in classrooms (Toms-Bronowski, 1982; Johnson, Toms-Bronowski, and Pittelman, 1982; and Johnson, Toms-Bronowski, Pittelman, and Levin (unpublished research).

As currently defined in Johnson & Pearson (1984, p. 42), semantic feature analysis is a strategy that draws upon a student's prior knowledge about words and places the emphasis on the relationship of concepts within categories. In this method, the student explores the ways in which the meanings of words differ. These relationships (sameness or difference) is shown by placing (+) and (-) signs in a table referred to as a semantic feature grid. The steps involved in this method are as follows:

1. Select a category (dog breeds)
2. List, in a column, some words within that category (Doberman, Samoyed, Cocker Spaniel, Toy Poodle)
3. List, in a row, some features shared by some of the words (Large, friendly, cute, white)
4. Put (+) or (-) beside each word and beneath features
5. Add additional words
6. Add additional features
7. Complete the expanded semantic feature grid with pluses and minuses
8. Discover and discuss the uniqueness of each word
9. Repeat the process with other categories

DOG BREED	Large (20 lbs)	Friendly	Cute	White
Doberman	+	-	-	-
Samoyed	+	+	+	+
Cocker Spaniel	-	+	+	-
Black Lab	+	+	+	-

The effectiveness of semantic feature analysis has been demonstrated in various research designs. Two studies, Toms-Bronowski (1982) and Johnson, et al. (1982), compared semantic feature analysis with two other vocabulary methods --semantic mapping and the traditional contextual approach to introducing vocabulary. Toms-Bronowski found that semantic feature analysis was more effective than both the contextual approach and semantic mapping. The Johnson,

Toms-Bronowski, and Pittelman (1982) study expanded on Toms-Bronowski's work in that a control group was included in the comparisons. As in the original research, semantic feature analysis was shown to be the most effective method.

Most reading educators would agree that the most common mode of reading instruction in elementary classrooms is the use of basal reading series. These programs usually include vocabulary instruction along with other reading skill development lessons. In this regard, the third study (Johnson, et. al., unpublished) investigated the effectiveness of semantic feature analysis and semantic mapping vs. a basal reader approach to introducing vocabulary. With regard to vocabulary acquisition before reading, Johnson, et.al. found that all three methods were effective when compared to a control (no treatment) condition. However, there were no significant differences between instructional treatments when these methods were used as prereading strategies.

Although this last study did not find significant effects in regard to comprehension, semantic feature analysis and semantic mapping were found to be significantly more effective than the basal approach in the area of general vocabulary acquisition.

PFS:FILE and PFS:REPORT

PFS:File and PFS:REPORT are two programs in the PFS family of software. PFS:File is an information management program with comprehensive filing, sorting, and searching capabilities. PFS:Report is a report-generating program that summarizes information from PFS:File and presents it in report form. PFS:Report can also perform calculations on numeric information as well as count individual items in categories.

The actual operating procedures are detailed in the PFS manuals and will not be detailed in this report.

In regard to this classroom exercise, PFS:File was used to develop the semantic categories and features. Information about the relationships of these features and categories was also collected using PFS:File. After the information was entered into the files, the PFS:Report was used to present the information in a modified grid form.

CLASSROOM PROCEDURES

This exploratory project was conducted over 4 one-hour sessions with some of the work completed outside of class. The equipment used in this exercise included an Apple microcomputer with two disk drives, a large screen monitor, and a printer. (Note: Any of the Apple family of computers may be used.) The content of each session is summarized:

Session 1: Introduction to semantic feature analysis using a sample exercise on pets.

During this session, the students were introduced to semantic feature analysis as a method of studying about words and relationships. The students were told that they would be using the computer as a tool for studying this method.

In the first step of the introduction, the semantic feature analysis was defined as follows:

Semantic	defined as "meaning"
Feature	defined as "an attribute or part of something, like hair or eye color"
Analysis	defined as "a way of describing something"

Next, the students were told that describing features of a word is one way of defining it and that the computer would help in the analysis of these features.

At this point, after a brief discussion of "dog breeds" two types of semantic feature grids were shown to the students, that which was typed (figure 1) and the computer format shown below:

Figure 2
Semantic Feature Grid for "Dog Breeds"
as generated by PFS:File and PFS:Report

DOG BREED	LARGE	FRIENDLY	CUTE	WHITE	NAME
BLACK LAB	+	+	+	-	BRANDY
COCKER SPANIEL	-	+	+	-	DARBY
DOBERMAN	+	-	-	-	REX
SAMOYED	+	+	+	+	TISHA

Then, using the large monitor, the students learned how

the PFS:File format was set up for the "Dog Breeds" semantic grid. In this case, the category "Dog Breed" is the first entry and the features are listed beneath it. The students were then given hands-on experience entering the (+) and (-) indicators into the file.

Next, students were introduced to PFS:Report. This program "reads" the information in the PFS:File data files and arranges the information in a "report" or "grid" format. Using the "Report Specification" screen, students saw the category assigned column 1 of the grid, and then how other features are placed in other columns.

After this introduction, two activities used PFS:File to study semantic features. The first activity dealt with pets, the second, with countries in Europe. In these, the grid included entries which were words as well as the traditional plus and minus indicators.

In the pet activity, the students were presented with the following PFS:File format:

Pet:	No. of Legs:
Class-Mammal:	Covering:
Class-Reptile:	Adjective:
Class-Fish:	Typical Name:

For this feature analysis exercise, the students were instructed to complete (on paper) the features for a pet they owned or one they knew of. They indicated the type of animal (Pet:) and (+) or (-) for the classification of the animal. They gave the number legs, described the covering of the animal (fur, etc.), and entered an adjective describing their pet. After entering the pet's name, each child came to the computer to enter they information. When the information was entered, the PFS:Report was used to develop a semantic feature grid.

Session 2: Using Semantic Feature Analysis in a Content Area - Introduction of Exercise

At this point the second semantic feature exercise took place--dealing with the countries of Europe. Students understood that the same process of defining features could be used to study about a country. After some discussion, the students decided to list language, government, and religion for each of the countries they would

study. These features were then entered into a PFS:File format.

After dividing the class into small groups, the teacher assigned a country to each, and provided reference material for study. When the group defined the features, the teacher entered the information into the computer file.

Session 3: Entry of Information

Students completed their research and all features were defined. Then, since each grid could have a maximum of 9 columns, the class discussed what types of feature grids should be generated by PFS:Report. This session proved to be highly productive in that the students were able to see the commonalities of the features they had defined. The grids the students wanted were printed outside of class and reviewed in the next session.

Session 4: Discussion of the Semantic Feature Grids

Several semantic grids were generated prior to the class period. These were reviewed by the students and displayed on the bulletin boards of the classroom. The students agreed that they enjoyed the process. They especially enjoyed seeing the computer search for information already entered and watching the printer make grids.

DISCUSSION

In this exercise, a computer data base system (PFS:File and PFS:Report) was used to develop semantic feature grids. The experiment proved to be highly successful in terms of introducing the process to students and adapting the microcomputer to this type of instruction. The following strengths and limitations were identified:

Strengths

1. Students were highly motivated to use the microcomputer. This could add to the initial effect of semantic feature instruction.
2. The teacher can focus instruction by developing grids with various combinations of columns. Also, grids can be developed to isolate certain groups within a category, for example, a grid could be made up for only "dogs" instead of all pets.
3. Once the information is entered into the PFS:File format, the disk can be used again in other instruction.

The disk can also be used as a database in other lessons.

4. As demonstrated in this project, semantic feature analysis can be adapted to other types of instruction, for example, reading for specific information.

5. Since PFS:File does not have to remain in the disk drive, several different categories can be developed if computers are available.

Limitations

1. Once PFS:File files are formed it is difficult to add new features to the category list. This procedure also requires a second disk drive and an extra disk.

2. Because only one file can be on any one PFS:File disk, if many grids are developed, there is need for several data disks.

3. Since PFS:File and PFS:Report are two separate systems, there is some disk swapping involved.

4. As mentioned, the PFS:Report will use up to 9 columns in a given grid; therefore, a wide printer may be required.

SUMMARY

Semantic feature analysis has been shown as an effective method for developing vocabulary related concepts. This report summarizes the results of a classroom experiment in which data base programs were used to develop semantic feature grids. This project used programs in the PFS family. There may be similar possibilities both with other more sophisticated systems such as AppleWorks or less sophisticated file development programs such as the Bank Street Filer. With some limitations as noted, PFS:File and PFS:Report were successfully applied to the development of semantic feature grids.

REFERENCES

Johnson, D.D. & Pearson,P.D. Teaching Reading Vocabulary-First Ed. NY: Holt Rinehart & Winston, 1978.

-----. Teaching Reading Vocabulary-Second Ed. NY: Holt, Rinehart and Winston, 1984.

Johnson, D.D., Pittelman,S.D., Toms-Bronowski,S. & Levin, K. An investigation of the effects of prior knowledge and vocabulary acquisition on passage comprehension. Unpubl. Report. Wisc. Center for Educ. Research.

Johnson,D.D., Toms-Bronowski,S., & Pittelman,S.D. An investigation of the effectiveness of Semantic Mapping and Semantic Feature Analysis with Intermediate Grade Level Children. Program Report 83-3, Wisconsin Center for Education Research, 1982.

Johnson, D.D., Toms-Bronowski, S. & Pittelman,S.D. An investigation of the trends in vocabulary research and the effects of prior knowledge on instructional strategies for vocabulary acquisition. Theoretical Paper No. 95. Wisc. Ctr. for Educ. Research, 1981.

Toms-Bronowski,S.C. An investigation of the effectiveness of selected vocabulary teaching strategies with intermediate grade level children. Unpublished Doctoral Dissertation, University of Wisconsin-Madison, 1982.

Software Reference

PFS:File and PFS:Report are published by Software Publishing Corporation, 1901 Landings Drive, Mt. View, CA.