West Virginia Secondary Agriculture Teachers' Estimates of Magazine Article Readability and Reading Grade Levels of Eleventh Grade Agricultural Education Students

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During the course of the past decade, there has been considerable focus on the literacy of the American population. One major concern is that students are illiterate when graduating from secondary school. If students are unable to read, their potential for learning is hindered because much of their class work is dependent upon reading reference material.

Bormuth (1969, p. 3) contends that a great deal of information contained in the school curricula relies on the reading of written materials by the students. Ability to comprehend the language in written materials is a major factor in effective instruction. For this reason, teachers should direct their attention to the matching of their students' reading abilities with the readability of the material assigned. In short, teachers should select materials that students can read.

In secondary agricultural education, teachers have a wide variety of instructional materials from which to choose. Unlike many other subject matter areas, agriculture teachers do not rely solely on textbooks. Curriculum guides, Extension publications, identification manuals, trade magazines, task sheets and popular periodicals were some of the instructional materials other than textbooks used by vocational horticulture teachers in Ohio (Welch, 1981, p. 52).

Many of these informational and technical publications are aimed at quite a diverse audience, not just high school students. This leads one to question how appropriate the publications are in terms of reading level difficulty in secondary agricultural education. Morrell (1977) sampled 150 students in vocational education programs in grades 9-12 and found them to be reading at a level two to nine years below their grade placement. The Vocational Reading Power Project (1972) presented data indicating that, in over 50 percent of the cases, students could not keep up with the reading demands of their textbooks.

Purpose and Objectives

This study examined the abilities of secondary agriculture teachers in West Virginia to estimate the readability of selected magazine articles which could be used in the classroom. In addition, teacher estimates of student reading levels were compared with actual reading levels as determined by the Comprehensive Test of Basic Skills. Major objectives of the study were to:

Determine the agricultural magazines used most frequently in comprehensive secondary agriculture programs.

Compare the teacher estimates of magazine article readability with readability as determined by the Dale-Chall Readability Formula.

Compare the teacher estimates of students' reading grade levels with actual reading grade levels.

Determine the influence of selected variables on teacher estimate error.

Procedures

Descriptive survey research was used in this study. The target population for this study was West Virginia secondary agriculture teachers. Subjects included in the study were those secondary agriculture teachers in comprehensive secondary agriculture programs located within a

fifty mile radius of West Virginia University. Generalizations resulting from the outcome of the study were limited to the secondary agriculture programs surveyed.

The survey instrument was adapted from a questionnaire used and validated at The Ohio State University by Welch in 1981. This survey used segments taken from Welch's questionnaire, and asked the frequency with which various agriculture magazines are being used, the teacher estimate of the reading level of each eleventh grade agriculture student, and the teacher estimates of readability of three selected magazine articles. The actual reading levels of students were obtained from the schools' guidance counselors for comparison to the teacher estimates.

The researcher reviewed the list of West Virginia Learner Outcomes and selected magazine articles addressing objectives of three areas taught in secondary agriculture. The areas chosen were agriculture mechanics, plant science and marketing. A list of agriculture magazines from which these articles were chosen was compiled by teacher educators. The articles chosen were representative of the types of articles read by students of agriculture. Teacher educators served as the panel of experts approving the selected articles. From these articles, teachers in the study were evaluated as to their ability to predict readability levels.

The readability tests of the three magazine articles to be evaluated by teachers were then conducted. The Dale-Chall Readability Formula was selected for use by Welch (1981) "because of its accuracy and its reputation among reading authorities for being reliable" (p. 41). There is a .92 correlation between this formula and judgments of experts (Klare, 1976, p. 55). The Dale-Chall Readability Formula (1948) was used to analyze readability levels of magazine articles used in this study.

Data Collection

Each school in the study was visited by the researcher. The guidance counselor was asked to assign an identification number to each student enrolled in the eleventh grade agriculture class to maintain confidentiality. Actual reading levels of students were deterrnined by the Comprehensive Test of Basic Skills and were made available to the researcher after the surveys were administered. Teachers were asked to estimate the reading level of each eleventh grade student in class.

The teachers were also given the selected magazine articles and asked to estimate the readability of each one. Approximately five to ten minutes were taken by each teacher to review each article. For prediction of readability of these articles, the teachers were not to use any formulas or other formal prediction techniques. This allowed the researcher to observe how familiar the teachers are with intuitive readability predication. Other survey items were completed by the researcher while interviewing each agriculture teacher.

Findings

Magazines most frequently used

In the ten school sample, nineteen different agriculture magazines were listed by the teachers as those most frequently used in their classrooms. Included in the most frequently used magazines in 50 percent of the schools were: National Future Farmer, Pennsylvania Farmer, Progressive Farmer, and Farm Journal. Next most frequently used magazine was Cooperative Farmer, listed by 40 percent of the teachers. Successful Farming and Farm and Ranch Living were named by 30 percent of the teachers as being used frequently in their classes. Farm and Dairy and Hoards Dairyman were used by 20 percent of the teachers and those magazines listed by a single teacher included: West Virginia Farmer and Forester, Lincoln Stabilizer, Vegetable Grower, Ford New Holland News, Agricultural Research, National Hog Farmer, Yorkshire Journal, The Sheep Farmer, Market Bulletin, and Bee Culture.

Readability of magazine articles

The next part of the questionnaire requested that teachers review three specified articles and then estimate the readability level of each article. The teachers were asked to place their estimates of readability levels of the articles in the following categories: below grade 7, grade 7-8, grade 9-10, grade 11-12, and above grade 12.

The results in Table 1 show that 40 percent of the teachers correctly estimated the readability of the first article. Thirty percent of the teachers

Table 1. Teacher Estimates of Readability

Article	Freauency									
	Below Grade 7		7-9		9-10		11-12		Above Grade 12	
	N	%	N	%	N	%	N	%	N	%
Virus May Help Eradicate Multiflora Rose	1	10	2	20	4	40	3	30	0	0
Master Marketing	0	0	3	30	4	40	3	30	0	0
Hog House Fix-Up	0	0	1	10	4	40	5	50	0	0

Figures underlined refer to actual readability levels as determined by the Dale-Chall Readability Formula.

thought the article was at a lower readability level that it actually was and 30 percent overestimated the reading difficulty of the article. Thirty percent of the teachers correctly assigned a readability level of grade 7-8 to the second article. The remaining 70 percent overestimated the readability of this article. The last article was correctly estimated at the readability level grade 1 1- 12 by 50 percent of the teachers, whereas 40 percent said that it was readable to grades 9-10 and 10 percent said that it was readable to students below grade 7.

The error in estimating readability in terms of grade levels from actual readability level was reported in frequencies (Table 2). For example, a teacher estimating that an article was at the 7-8 grade readability level was considered two grade levels off if the actual readability was grade 9-10. Four teachers were incorrect by an average of four grade levels when estimating readability. An additional two teachers were incorrect by an average of three grade levels and the remaining four teachers were incorrect in estimating the readability by one grade level.

Table 2. Estimated and Actual Reading Grade Levels of Eleventh Grade Students

School	Student Reading Level	
	Estimated Mean	Actual Mean
01	9.61	11.61
02		
05	10.93 9.71	12.43 8.86
06	10.18 8.80	10.27 8.40
07		
08	10.60 9.93	9.80 8.93
09	7.00	8.75
10	8.12	12.62
Overall Mean	9.50	10.40

Reading grade level

Teachers were asked to estimate the reading grade level of each of their eleventh grade students. Means of these estimates along with the actual reading grade levels were found (Table 2). The difference between the estimated and the actual reading grade levels was the amount of error in teacher estimations. The mean reading grade levels of eleventh grade students in the study was 10.4 while the median was 10.3. The mean teacher estimate was a 9.5 reading grade level and the median was 9.8. The mean difference in estimated and actual reading grade levels was 1.7 years and the median was 1.4 years (Table 2).

Relationshins between readabilitv estimation error and grade level estimation error and selected demographics.

Magnitude and direction of relationships between error in estimation of readability and reading grade level with selected factors were computed using the SSPS-X procedures CORRELATIONS (SPSS, Inc., 1988). These relationships included correlations between readability and grade level estimation error and the selected demographics of teacher age, educational degree held, years of teaching experience, if they had a content area reading course, if they provide reading assistance, and if they ask their students to read aloud in class. Davis' (1971) scale was used to describe the magnitude of relationships between variables.

Data in Table 3 indicate negligible to low relationships for all factors except three. There was a moderate relationship (r=.34) between educational degree held and the error in estimating reading grade level. In comparing teachers who ask students to read aloud in class with the error in

estimating reading grade level, a very strong negative relationship (r=-.81) was found to exist. Point biserial correlation coefficients for these variables are shown in Table 3. The information in Table 4 is valuable for clarifying the interpretation of the two significant variables.

Table 3. Correlation Between Variables and Teacher Error in Estimating Readability and Reading Grade Levels

	Teacher Error in Estimating Readability	Teacher Error in Estimating Reading Grade Levels
Age[2]	.1395	-. 1682
Educational degree[1]	.3440	.1134
Years teaching[2]	-.0539	.0347
Reading course[1]	-.2949	-.0638
Assist students[1]	-. 1930	-.6106*
Read aloud[1]	.0369	-.8063*

*Significance at .05 alpha level.
[1]=Point Biserial Correlation Coefficient
[2]=Pearson Product Moment Correlation Coefficient

Table 4. Mean Error in Estimation of Readability and Reading Levels When Compared with Selected Variables

	Readability		Reading Grade Level	
	Mean	St. Error	Mean	St. Error
Read Aloud				
Yes	2.63	0.498	1.15	0.259
No	2.50	1.500	3.81	1.075
Assist Students				
Yes	2.43	0.528	1.16	0.345
No	3.00	1.000	2.91	0.990

Influence of reading course completion

The t-test measured the differences observed between the independent variable of teachers having taken a reading course and the dependent variables of error in estimating readability and reading grade levels. Results reveal that there was no significant difference in ability to estimate readability (t=.87) or student reading grade levels (t=.18) by teachers who had taken a reading course versus those who had not.

Conclusions

Based upon the findings of this study, the following conclusions were made:

Four popular agriculture magazines are most frequently used as reference materials for agriculture students in comprehensive high schools.

Teacher characteristics have little or no influence on the teachers' abilities to estimate readability of materials.

Characteristics which have a substantial influence on teachers' abilities to estimate student reading grade levels are (1) teachers asking the students to read aloud and (2) giving students reading assistance. Teachers who ask students to read aloud and who provide assistance can more accurately estimate reading grade level and readability than those teachers who do not; however, neither group are accurate in their estimates.

Recommendations

Readability formulas are valuable for the purpose of assigning a general age or ability level to which a certain writing is readable or understandable. The teacher should be familiar with readability formulas so that if there is a question in his/her mind as to the difficulty of a written work or its suitability to the students, a readability test can be performed to find the approximate difficulty level of the writing. In determining readability of suitability of a particular selection, a plethora of factors come into play. Aside from the factors involving vocabulary, sentence and word length, the sentence structure, reader interest and the knowledge that the reader has already grasped are extremely important in determining how much reading success and satisfaction the reader will enjoy. Before making reading assignments, teachers should preview the material with the students, ensuring that the students have at least a minimal amount of background knowledge of the subject at hand.

An inservice session for teachers should be held in which a variety of techniques designed for reading readiness are taught. Not only should pre-

reading techniques be taught, but also those designed to assist the reader during and after reading. Post-reading strategies such as outlining, summarizing, word puzzles or study guides are excellent means of reinforcing the material in the reader's mind These types of strategies might also be found useful by teachers if published occasionally in education periodicals. This may also increase teacher awareness of the reading abilities of their students.

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