

Osburn, D.D., K.C. Schneeberger, M.R. Wilsdorf, and E.S. Reber. June 1981. Microcomputer Aided Instruction. *NACTA* 24-26.

Pelz, D.R. and D. J. Ware. June 1978. PLATO in Forestry. *NACTA* 11-3.

Reynolds, D.S. and R.D. Simpson. January 1980. Pilot Study Using Computer-Based Simulations on Human Transactions and Classroom Management. *Sci. Educ.* 64:35-41.

Singh, I. April 1979. The Computer-Assisted Test Construction and Marking System (CATCAMS). *Educ. Tech.* 19:46-48.

Smith, S. G. and B.A. Sherwood. April 1976. Educational Uses of the Plato Computer System. *Sci.* 192:344-52.

Wasik, J. L. Autumn 1979. GENTEST: A computer Program to Generate Individualized Objective Test Forms. *Educ. and Psych. M.* 39:653-6.

Acknowledgments

The authors wish to express sincere appreciation to John R. Strayer for his assistance in developing CMI in the department; to graduate students in the Department of Computer and Information Sciences who developed the stub; and to graduate students in the Department of Entomology and Nematology who helped categorize test questions. Florida Agricultural Experiment Station Journal Series No. 3954.

Reading Level

Community College Ag Students Compared to Their Textbooks

Tony Chavez, Fred Reneau,
Jim Legacy and Tom Stitt
Introduction

Community college agriculture students learn their occupational skills through various types of experiences. Just as "hands-on" experience is vital to learning occupational skills, the classroom experience is essential to develop student knowledge of agriculture. Agricultural textbooks play a major role as an instructional resource in classroom experiences.

Technically trained students who have entered the job market with strong reading abilities have enjoyed a distinct advantage over students with weak reading abilities. By virtue of their manipulative skills and abilities to mentally process written information these students have advanced in their occupations. Agricultural students who lack strong skills in reading have been improperly trained for their occupations (Thorton, 1980).

Chavez is a graduate student, Reneau an assistant professor, Legacy an associate professor and Stitt a professor in the Department of Agricultural Education and Mechanization at Southern Illinois University, Carbondale, IL 62901.

"Hands-on" experience has been identified as a powerful instructional tool in teaching occupational skills, and textbooks should be included in the learning process for young agriculturalists.

Reading instruction should be included in school from the pre-elementary grades through the collegiate level (Rerine, 1980). By teaching readers to comprehend progressively more difficult material, educators could lessen the negative effects of the language barrier many students have experienced.

Rerine's study showed that traditional instruction seldom extends beyond the elementary grades. Implementing more rigorous reading instruction at all levels would facilitate more language skill development for coping with burgeoning changes in language. Students enabled themselves, according to Rerine, to prepare for work by heightening their literacy.

Training students to be literate must include reading instruction in preparation for the challenge of learning the complexities of language used for communication in the world of work and school. Reading should be addressed as a vocational skill because vocational and occupational literature require different applications of the English language, which vary by degrees in complexity when compared to general literature. The vocational/technical student must be taught how to read and understand vocational and occupational literature.

Significance of the Problem

The learning difficulties observed within the study population implied deficiencies in reading skills. Such deficiencies prevented students from using their textbooks. This condition for some students was adverse enough to hinder their instructors' efforts to enhance their occupational training with assigned readings from class texts. It was important to know how many of the students were deficient in reading skills.

Objectives

The purpose of this study was to conduct an inventory of the reading abilities of vocational agricultural students and compare their reading abilities to the readability levels of their textbooks.

The specific objectives were:

1. Measure the general reading levels of the agriculture students.
2. Measure the readability levels of the agriculture textbooks.
3. Compare the students' reading abilities to readability levels of their textbooks.

Procedures

Population

Data for this study were collected from sixty-six vocational agriculture students and the twenty-three agriculture textbooks used in the agriculture program at Rend Lake College. All students majoring in agriculture at Rend Lake College in spring of 1982 participated in the study.

Table 1. Vocational Agriculture Textbooks Read Lake College Agriculture Program January 1982

Title	Editor/Author Publisher/Date	Major	Students
Animal Agriculture: The Biology, Husbandry and Use of Domestic Animals.	H.H. Cole, W.N. Garrett; W.H. Freeman & Co.; 1980	P13B14	18
Diesel Engine Repair	John F. Dagele J. Wiley & Sons Inc. 1982	M13P14	26
Economics: Principles, Problems, and Policies	Campbell R. McConnell McGraw-Hill; 8th ed. 1981.	B13P14	25
Feeds and Feeding	Arthur E. Cullison; Reston Publishing; 2nd ed. 1982.	B13P14	25
Fundamentals of Machine Operation (series):	Deere & Co.; 4th ed/2nd printing 1979.		
1. Combine Harvesting		M13P14	26
2. Hay and Forage Harvesting		M13P14	26
3. Machinery Management		M13P14	26
4. Planting		M13P14	26
5. Tillage		M13P14	26
Fundamentals of Soil Science	Henry D. Roth J. Wiley & Sons Inc. 6th ed. 1978.	B13P13	16
Fundamentals of Service: (series)	Deere & Co.; 3rd ed. 2nd printing 1979.		
1. Belts and Chains		M14	13
2. Engines		M13P13	17
3. Hydraulics		M13	10
4. Power Trains		M14	13
5. Identification of Parts Failures		M14	13
6. Electrical Systems		M13P14	26
7. Bearings and Seals		M14	13
8. Welding		M14P13	20
Modern Corn Production	Walter O. Scott Earl R. Leng A & L Publishers; 1975	P14B14	27
Modern Soybean Production	Walter O. Scott Samuel Airich S & A Publishers; 1970.	P14B14	27
Pipe Welding Techniques	Ivan Griffen, E.M. Roden; Delmar Publishers, 1978	P13M14	20
Prairie Farmer	July, 1981 v. 153 No. 14, 15, 16	P13P14B	14
Salesman Fundamentals	J.D. Ernest McGraw Hill Book Co. 4 ed; 1973	B14M14	24

M = Mechanics P = Production B = Business 13 = Freshman 14 = Sophomore

Table 2. Agricultural Students' Nelson-Denny Reading Test Scores and Grade Equivalents January 1982, N=66

Major Grade Level	Vocabulary		Comprehension	Rate	Total Raw
	N	GE 1,2	GE	Raw/GE	Score/GE
Agricultural Business 13	9	29.4/11.9	35.3/11.5	194.3/9.3	64.7/11.8
Agricultural Business 14	11	32.7/12.8	37.6/12.2	221.5/10	67.8/12.5
Agricultural Production 13	7	23.4/10.9	31.42/10.5	190.7/9	54.8/10.7
Agricultural Production 14	16	19.7/10.1	26.62/9.3	193.3/9	46.3/9.7
Agricultural Mechanics 13	10	22.6/11	29.2/10	239/11.2	51.8/10.4
Agricultural Mechanics 14	13	30.5/12.6	32.92/10.9	223.5/10	55.7/11
Total	66	26.38/11.5	32.17/10.7	210.38/9.7	56.85/11

1 = Raw Score 2 = Grade Equivalent

Twenty-three students majored in agricultural mechanics, 23 students majored in agricultural production and management, and twenty students were agricultural business management majors. The twenty-three textbooks used in the vocational agriculture program are listed in table 1.

Data Collection and Analysis

The Nelson-Denny Reading Test was used to achieve the first objective: to measure the levels of general reading skills possessed by the students. The test (Form A) was used to generate data in vocabulary, comprehension, reading rate, and grade level equivalent (reading skill appropriate for nth grade in school).

The Extended Fry Readability Graph was used to achieve the second objective: to measure the readability levels of the twenty-three textbooks. The graph was used as the computational process for determining a mean level of readability for all of the textbooks measured.

Means calculated for students' reading levels and for textbooks' readability levels were used to achieve objective three: to compare students' reading levels to readability levels of their textbooks. Textbooks and agriculture students were classified by major field of study (agricultural business, agricultural production, or agricultural mechanics). A "discrepancy grade level" was determined by major.

Findings

The mean reading level equivalent for the sixty-six agriculture students was the eleventh grade. Three

Table 3. Readability Level of Textbooks Used in Rend Lake College Agriculture Program January 1982 N=66

Title	Mean Readability Level
Animal Agriculture: Biology, Husbandry and Use of Domestic Animals	15
Diesel Engine Repair	15
Economics: Principles, Problems & Policies	17
Feeds & Feeding	13
Fundamentals of Machine Operation (series):	
a. combine harvesting	11
b. hay and forage harvesting	11
c. machinery management	12
d. planting	10
e. tillage	11
Fundamentals of Soil Science	14
Fundamentals of Service (series):	
a. belts & chains	10
b. identification of parts failures	10
c. hydraulics	10
d. electrical systems	11
e. power trains	11
f. bearings and seals	10
g. engines	10
h. welding	10
Modern Corn Production	11
Modern Soybean Production	15
Pipe Welding Techniques	8
Prairie Farmer	14
Salesmanship Fundamentals	11
Mean	12.06

agriculture students (4.5 percent) read at a grade equivalent level equal to their grade in school. Sixty agriculture students (91 percent) read at a grade equivalent below their grade in school. Three agriculture students (4.5 percent) read at a grade equivalent level above their grade in school.

The textbooks used by agriculture students ranged from a low of 8th grade level to high of 17th grade level. The mean grade for the twenty-three textbooks was the 12th grade level.

The mean readability level for all of the textbooks was twelfth grade. The mean grade level discrepancy between the mean readability level and the mean of the general reading abilities of the students was one grade level. (Table 4). The highest grade level discrepancy occurred between the Sophomore Production majors and their textbooks, three grade levels. The lowest grade level discrepancy occurred between the Sophomore Business majors and their textbooks; there was not a discrepancy (Table 5).

Table 4. Discrepancy Between Agriculture Students' General Reading Levels and Readability Level of Textbooks by Major Field of Study January 1982 N = 66

Major	Textbook Readability Level X	Student Reading Level X	Discrepancy (Grade Level)
Agricultural Business Management	13.5*	12.1**	+1.4***
Agricultural Production Management	12.2	10.2	+2.0
Agricultural Mechanics	10.5	10.7	-.2
Mean	12.06	11	+1.06

* - read 13th grade, 5th month

** - read 12th grade, 1st month

*** - read 1 grade level, plus four months

Table 5. Grade Level Discrepancies Between 13th & 14th Grade Agriculture Reading Abilities and the Readability of Their Textbooks January 1982 N = 66

Major/Grade Level	Reading Level		Grade Level Discrepancy
	Textbooks Mean	Students Mean	
Agricultural Business 13	14.5	11.85	+2.65
Agricultural Business 14	12.5	12.5	0
Agricultural Production 13	11.75	10.78	+.97
Agricultural Production 14	12.72	9.7	+3.02
Agricultural Mechanics	11.24	10.4	+.84
Agricultural Mechanics	9.8	11	-1.2

Summary of Conclusions

1. As a group, the agriculture students possessed general reading abilities below the collegiate level: 75 percent of the students read below the thirteenth grade level.
2. Technical textbooks in the agriculture program possessed a wide range of readability levels from 8th grade level to 17th grade level.

3. Agriculture textbooks' readability levels comparison to agriculture students' general reading abilities yielded a discrepancy of one grade level.

Recommendations

1. Provide instruction to upgrade the students reading skills.
2. Test agriculture students ability to read and comprehend assigned textbooks.
3. Determine the readability level of textbooks to be used in agriculture programs.
4. Emphasize reading skills in the training of vocational students.

References

- Fry, Edward B. April 1968. A Readability Formula That Saves Time. *Journal of Reading*, Vol. 11, No. 7.
- Nelson M.J. and Denny, E.C. 1960. The Nelson-Denny Reading Test, Form a, Revised Edition. Boston: Houghton Mifflin.
- Rerine, Maxine H. 1980. Teaching Reading in Vocational Education. Flint MI: ERIC Document Reproduction Service, ED 189 556.
- Thornton, L. Jay. 1980. Basic Reading Skills and Vocational Education. Ohio State University, Columbus. National Center for Research in Vocational Education: ERIC Document Reproduction Service, ED 189 278.

30th NACTA Conference June 17-20



**Pullman,
Washington**