R E P O R T R E S U M E S

ED 016 783 VT 001 940

THE ADOPTION OF EDUCATIONAL INNOVATIONS AMONG TEACHERS OF VOCATIONAL AGRICULTURE, A DIGEST OF A PH.D. DISSERTATION.
RESEARCH SERIES IN AGRICULTURAL EDUCATION.

BY- CHRISTIANSEN, JAMES E. TAYLOR, ROBERT E.
OHIO STATE UNIV., COLUMBUS, DEPT. OF AGR. EDUC.

PUB DATE JUN 66.

EDRS PRICE MF-$0.25 HC-$2.36 57P.

DESCRIPTORS- *VOCATIONAL AGRICULTURE TEACHERS, *ADOPTION (IDEAS), *DIFFUSION, *EDUCATIONAL INNOVATION, STATE SUPERVISORS, INFORMATION SOURCES, OHIO,

TO DETERMINE THE RELATIVE INFLUENCE EXERTED BY DIFFERENT SOURCES ON THE ADOPTION OF INNOVATIONS AMONG EXPERIENCED VOCATIONAL AGRICULTURE TEACHERS, THIS STUDY HAD AS SPECIFIC OBJECTIVES TO (1) DEVELOP MEANS OF CLASSIFYING TEACHERS INTO ADOPTER CATEGORIES, (2) IDENTIFY THE MORE INFLUENTIAL SOURCES OF INFORMATION IN CREATING AWARENESS, (3) IDENTIFY SELECTED SOURCES INFLUENTIAL IN CAUSING ADOPTION OR REJECTION, (4) DETERMINE TEACHER PERCEPTION OF REASONS FOR ADOPTION OR REJECTION, (5) ANALYZE THE ROLE OF SOURCES OF INFORMATION IN ADOPTION OR REJECTION, (6) IDENTIFY THE MORE EFFECTIVE CHANNELS OF COMMUNICATION, AND (7) DETERMINE WHETHER DISTRICT SUPERVISORS COULD IDENTIFY INNOVATIVENESS AMONG TEACHERS. DATA WERE OBTAINED FROM 101 EXPERIENCED VOCATIONAL AGRICULTURE TEACHERS OF 14 SUPERVISORY DISTRICTS IN OHIO. A PRETESTED INSTRUMENT WAS USED IN GROUP INTERVIEWS AT REGULAR DISTRICT MEETINGS. SUPERVISORS WERE TESTED ON THEIR ABILITY TO IDENTIFY ADOPTION CATEGORIES OF TEACHERS WITH A TWO-WAY, FORCED-CHOICE, COMPARISON-OF-PAIRS INSTRUMENT. SOME OF THE FINDINGS WERE--(1) STATE SUPERVISORS WERE THE MOST FREQUENT SOURCES OF INFORMATION, (2) THE MOST COMMON REASONS FOR ADOPTION WERE STATE SUPERVISOR'S RECOMMENDATIONS AND OBSERVATION OF THE INNOVATION IN USE, (3) LACK OF CONVICTION AS TO THE VALUE OF A PRACTICE AND NEED OF ADDITIONAL TRAINING TO UTILIZE IT WERE THE MOST FREQUENT REASONS FOR NOT ADOPTING AN INNOVATION, ESPECIALLY AMONG THE SLOW ADOPTERS, AND (4) DISTRICT SUPERVISORS, GENERALLY, COULD DETERMINE THE DEGREE OF INNOVATIVENESS EXHIBITED BY TEACHERS WITHIN THEIR DISTRICTS. THE COMPLETE DISSERTATION BY JAMES CHRISTIANSEN IS AVAILABLE AS 66-6239 FOR $3.05 ON MICROFILM AND FOR $10.60 AS XEROXED COPY FROM UNIVERSITY MICROFILMS, INC., 300 NORTH ZEEB ROAD, ANN ARBOR, MICHIGAN 48106. (JM)

RESEARCH SERIES IN AGRICULTURAL EDUCATION

A Research Report of a Graduate Study

Issued by
The Department of Agricultural Education
College of Agriculture and Home Economics
The Ohio State University
Columbus, Ohio 43210

September 1966

RESEARCH SERIES IN AGRICULTURAL EDUCATION

A Digest of a Ph.D. Dissertation

THE ADOPTION OF EDUCATIONAL INNOVATIONS AMONG TEACHERS OF VOCATIONAL AGRICULTURE

James E. Christiansen and Robert E. Taylor

Issued by
The Department of Agricultural Education
College of Agriculture and Home Economics
The Ohio State University
Columbus, Ohio 43210
June, 1966

CONTENTS

	Page
Introduction	1
Purpose of the Study	1
Specific Objectives	2
Theoretical Base for the Study	3
Hypotheses	4
Importance of the Study	6
Method of Investigation	10
Major Findings	15
General findings	15
Specific findings related to the working hypotheses	18
Conclusions and Implications	22
Conclusions and implications pertaining to working hypotheses	22
Other conclusions and attendant implications	30
Recommendations	36
Recommendations for further research	36
Specific recommendations for improving a study of this type	42
Concluding Statement	44
Bibliography	45

THE ADOPTION OF EDUCATIONAL INNOVATIONS AMONG TEACHERS OF VOCATIONAL AGRICULTURE

Introduction

Investigation of work by previous researchers revealed some studies which were investigations of the innovation diffusion process and the innovation adoption process as they pertained to individuals within certain social or professional groups. However, investigation did not reveal studies that have pertained to the role which either process has played in influencing and convincing teachers of vocational agriculture to incorporate new educational innovations into their instructional programs. An investigation of this area was undertaken because of the implications present for state staff personnel for increasing the impact, effectiveness, and efficiency of existing programs of pre-service and in-service education for teachers as well as for providing meaningful supervisory programs within this educational discipline. This could be done through a better understanding of how and why teachers adopt educational practices.

Purpose of the Study

The central purpose of this study was to determine the relative influence exerted by different sources on the adoption of specific educational innovations among experienced teachers of vocational agriculture in Ohio who had been identified as being members of specific innovation-adopter categories.

Specific Objectives

The following specific objectives were identified to facilitate the development of this study:

1. Develop a means of classifying experienced teachers of vocational agriculture into specific adopter categories.

2. Identify the specific sources of information which are relatively more influential than others in making experienced teachers of vocational agriculture in each of the adopter categories aware of new educational innovations.

3. Identify the selected sources of information which are most influential in convincing experienced teachers of vocational agriculture in each of the adopter categories to adopt or not adopt specific educational innovations.

4. Determine the perceptions of experienced teachers in the various adopter categories as to why selected educational innovations were or were not adopted.

5. Analyze the role played by the different sources of information in the adoption or non-adoption of educational innovations.

6. Identify the more effective channels that state staff members could use in influencing the adoption of recommended educational practices.

7. Determine whether or not district supervisors of agricultural education could identify innovativeness among teachers of vocational agriculture.

Theoretical Base for the Study

The following statements were set forth as being essential to the development of a theoretical base for the study undertaken and were the bases from which the working hypotheses were determined.

1. Different sources of information about the relative value and appropriateness of educational innovations exist.

2. These sources of information exert varying influences on experienced teachers of vocational agriculture in their adoption of specific educational innovations.

3. Experienced teachers of vocational agriculture are typical of people in other vocations in that they adopt or reject innovations at different rates. Consequently, they may be placed in different adopter categories such as innovators, early adopters, early majority, late majority, and laggards.

4. Different sources of information exerting varying influence on the relative worth of educational innovations are used by experienced teachers in evaluating the worthwhileness of adopting or rejecting a specific educational innovation.

5. Experienced teachers of vocational agriculture are typical of people in other vocations in that they will pass through different stages of adoption, though not necessarily in a given order, such as awareness of a practice, interest in a practice, evaluation and trial of a practice, and adoption or rejection of a practice.

6. A particular source may exert a different influence at different stages in the adoption of an innovation.

7. The relative influence of a source may vary according to the adopter category of which a teacher is a member.

Hypotheses

From the theoretical base established above, the working hypotheses to be tested were determined. They are listed below.

1. The various sources which provide information that influences the adoption of educational innovations used by experienced teachers of vocational agriculture generally vary according to the adopter categories to which those teachers belong.

2. Experienced teachers of vocational agriculture are influenced by different sources at the awareness stage, the interest stage, and at the adoption stage in the process of adopting innovations.

3. The more innovative the experienced teacher is, the greater the use he is likely to make of impersonal sources of information.

4. The more innovative the experienced teacher is, the greater the use he is likely to make of sources outside of agricultural education.

5. The more innovative the experienced teacher is, the greater the use he is likely to make of non-local sources of information.

6. The more innovative the experienced teacher is, the greater the use he is likely to make of sources of information which require a larger personal investment in time and money.

7. The more innovative the experienced teacher is, the greater is the likelihood that he will be teaching in a school with a relatively high instructional expenditure per pupil.

8. The more innovative the experienced teacher is, the greater is the amount of personal money he is likely to spend on materials for his instructional program.

9. The more innovative the experienced teacher is, the younger he is likely to be.

10. The more innovative the experienced teacher is, the fewer the number of years of total teaching experience he is likely to possess.

11. The more innovative the experienced teacher is, the greater the amount of education he is likely to have obtained in a formal credit program since his initial certification.

12. The more innovative the experienced teacher is, the greater the amount of money he is likely to have invested in professional growth.

13. The more innovative the experienced teacher is, the greater the amount of occupational experience he is likely to possess outside of the teaching field.

14. The more innovative the experienced teacher is, the greater the number of professional publications in education he is likely to read regularly.

15. The more innovative the experienced teacher is, the greater number of professional visits to departments of instruction other than vocational agriculture he is likely to make on his own initiative.

16. The more innovative the experienced teacher is, the greater the number of non-local professional meetings he is likely to attend.

17. The more innovative the experienced teacher is, the greater the number of other departments of vocational agriculture he is likely to visit on his own initiative.

18. With the exception of the members of the innovator category, the more innovative the experienced teacher is, the greater is the degree of opinion-leadership which he is likely to hold.

Importance of the Study

Several pressing reasons exist for the systematic identification of the sources of information influencing teachers at various stages in the innovation adoption process who are members of a particular innovation-adopter category. A study of the adoption and, to a lesser degree, the diffusion of educational innovations among experienced teachers who are members of specific innovation adopter categories should give us a better understanding of how these same teachers utilize different sources of information before deciding to adopt or to reject the use of a specific innovation in their instructional program.

For 48 years, large investments in time, money, education, and supervision in agricultural education have been directed toward the objective of making better teachers out of those persons teaching in the field and thereby improving the instruction received by the students under their care. In 1963, alone, $5,799,029.17 was spent on teacher-education, supervision, administration, and research in federally aided programs in vocational agriculture in the United States. During this same year, a total of $74,478,044.69 was spent by local, state, and Federal agencies on all programs of vocational agriculture across the nation. Of this amount, $2,752,423.49 constituted

the cost of vocational agriculture in Ohio.[1] Consequently, a study which provided ideas and structure a state staff could use to accelerate the change process would have served its purpose if increased yield in educational outcomes per dollar invested could result.

If we can better understand the process of the diffusion of innovations among teachers of vocational agriculture, then we would be in a better position to predict, for example, which pre-service training program, in-service education programs, graduate study programs, short-term clinics and workshops, individual field supervision activities, annual teachers' conferences, media of professional information or of commercial information, pilot programs, or similar activities would provide the sources of information for particular educational innovations that would be most influential in determining their acceptance and usage by teachers in different adopter categories. This power of prediction would be increased if we could identify the key sources and key groups in the diffusion process which result in more effective, economical, and rapid rates of adoption of educational innovations by these teachers. Perhaps, from our research, we could obtain clues to other procedures or alternatives which would speed up the adoption process engaged in by teachers. This has been shown repeatedly in work overseas with developing cultures when the adoption of innovations

---

[1] Vocational and Technical Education: A Review of Activities in Federally Aided Programs, Fiscal Year 1963, Bulletin OE-80008-63, United States Department of Health, Education, and Welfare; Office of Education (Washington, D.C.: U. S. Government Printing Office, 1964), p. 47.

snowballed once successful demonstrations were made by accepted leaders.[2] It would make the role of the change agent, as perceived by teacher educators and supervisors, much easier in accelerating desired change. Then too, it should be possible to shorten the time lag of 50 years from awareness to widespread adoption of educational practices among school systems found to exist by Mort and Cornell.[3]

If the investigator's hypotheses were correct, then it might be true that much of our effort and expense has been devoted to inefficient methods of improving the instruction given by teachers to their students. This might be true because educators themselves were unaware of and therefore had not been taking advantage of the dynamics of change inherent in the process by which teachers obtained new ideas of which they had become aware and in which they became interested, evaluated, and then rejected or accepted for incorporation into their teaching methods and instructional program. In other words, possibly we have been guilty of using a "shotgun" approach to improving the teacher's instruction rather than the "rifle" approach utilizing key sources and key groups in both the adoption as well as the diffusion process. We may have stopped our efforts prematurely before maximum results were obtained or we may not have selected precisely the particular opinion leaders among teachers to serve as "targets" and initial vehicles of change within the profession. The results of this

---

[2]Conrad M. Arensberg and Arthur H. Niehoff, Introducing Social Change: A Manual for American Overseas (Chicago: Aldine Publishing Company, 1964), p. 85.

[3]Donald H. Ross, Administration for Adaptability: A Source Book Drawing Together the Results of More than 150 Individual Studies Related to the Question of Why and How Schools Improve (New York: Metropolitan School Study Council, 1958), p. 43.

study could thus be used to increase the effectiveness of pre-service, in-service, and supervisory programs of teacher education in vocational agriculture.

In a study reported by Ross, 2,416 teachers were asked the question, "Where did you get ideas for changes you have made or would like to make?" The following is a tabulation in per cent of the ten most common replies given by teachers to this question:[4]

1.	Professional literature	20.9%
2.	Teaching experience	18.4%
3.	Observation of other schools in the system	9.4%
4.	College or university	9.4%
5.	Study of pupil needs and interests	8.0%
6.	Contact with other teachers	7.2%
7.	Summer school	6.8%
8.	General literature	5.5%
9.	Conventions, conferences, institutes	4.9%
10.	Original ideas	4.6%

The relative value of similar sources of information, such as "professional" literature, has been found to exist among farmers. Does the same relative pattern exist among teachers of vocational agriculture? If so, have we encouraged too many visits and contacts with other teachers on the premise that they will "pick up" new ideas that can be used to improve their own instruction? Have we spent too much time and effort on the annual teachers' conference in relation to its

---

[4] Ibid., p. 442.

actual value to teachers as a source of ideas and help for teaching? Or have we used such conferences for the wrong purposes? Are activities such as teachers' conferences of value only to a small number of persons as reported above? Carlson states that, "It has been found, for example, that teachers who attend out-of-town educational meetings are more innovative."[5] Is there an implication present that we should, on the other hand, continue and expand efforts to involve teachers in professional meetings? Or should such activities be free choice? Or are there other values in these types of activities?

In summary, it could be seen that, if substantiated by further research, the identification of the sources used by teachers of vocational agriculture to obtain information about educational innovations useful to them in teaching as well as the determination of the relative influence of these sources could influence the content, methods, and the emphasis provided in pre-service, in-service, and supervisory programs of teacher education.

Method of Investigation

The study was based on data received from 101 experienced teachers of vocational agriculture in seven of the fourteen supervisory districts making up 38.8 per cent of all experienced teachers in Ohio who had taught three or more years. The unit of adoption in the study was the individual teacher. A descriptive survey utilizing group interview techniques was the procedure used in the study for gathering data.

---

[5]Richard O. Carlson, Change Processes in the Public Schools (Eugene, Oregon: The Center for the Advanced Study of Educational Administration, University of Oregon, 1965), p. 60.

The study was restricted to the professional aspects of the teacher's work involving educational innovations. Consequently, it did not treat agricultural or subject-matter innovations. No attempt was made to evaluate the present program of vocational agriculture being conducted by teachers, nor the existing programs of teacher-education and supervision pertaining to vocational agriculture in Ohio.

Teachers with three or more years of teaching experience were selected to ensure that those persons studied had had an opportunity to be influenced by and to utilize sources of educational innovations other than those inherent primarily in the pre-service program of teacher education. The mean number of years of teaching experience for the 101 teachers in the study was 15.7 years. The mean for all teacher in Ohio with three or more years of experience was 14.8 years.

The supervisory districts in which these teachers were located were selected in terms of general agricultural, educational, and socio-economic representativeness. Such representativeness was sought to permit possible application of the findings and conclusions to teachers outside of those included in this study if desired by other investigators.

Teacher-innovativeness was measured by means of an adoption scale made up of individual innovativeness scores derived from twenty-seven innovations involving two factors, namely, the length of time it took a teacher to adopt an innovation and the number of innovations adopted of those that could have been adopted. This adoption scale was devised after analyzing the attempts of previous investigators, primarily in rural scoiology, to measure innovativeness on the basis of judges' ratings, self-perception values, and adoption scales based on the relative time of adoption of a specific innovation or innovations.

The innovativeness score used had the following formula:

$$IS = \frac{tla + tlp}{Na} \times \frac{33}{Ye}$$

Where:

tla: time lag expressed in years for all practices adopted by the individual teacher
tlp: time lag penalty in years for remaining practices not adopted which could have been adopted
Na: number of practices actually adopted
33: maximum length of experience of any teacher investigated
Ye: years of experience possessed by the individual teacher

The ratio, 33/Ye, represented an equalization factor developed to prevent the teacher who began teaching most recently from receiving undue credit for practices already adopted when in reality the investigator did not know which of the remaining practices not currently adopted would be adopted in the future and if they were adopted in the future, what time lag would occur between the date when the practice could have been adopted and date it actually would have been adopted.

The total rankings of the individuals on the basis of their innovativeness scores were then arrayed and classified into the five commonly accepted adopter categories of innovator, early adopter, early majority, late majority, and laggard on the basis of the two parameters of the normal distribution, namely, the mean and the standard deviation. The innovators made up the most innovative 2.5 per cent of the sample, the early adopters the next most innovative 13.5 per cent, the early majority and the late majority the next 34 per cent, respectively, and the laggards the least innovative 16 per cent of the sample.

The twenty-seven educational innovations used in the adoption scale and the five innovations used to determine the influence of different sources of information as well as those factors affecting the adoption or non-adoption of innovations were those which were specifically applicable to teachers of vocational agriculture in Ohio. These practices were ones which could be adopted by the teacher rather than by the institution, would not be perceived as a threat to existing practice thereby reducing its chances of being adopted, and furthermore, could be adopted by the teacher without having to consider administrative approval, major budgetary limitations, community sanction, class schedule or work schedule changes, or school board policy. Eighteen of the practices could have been used by teachers at any time after they began teaching while nine had definitely assignable "introduction" dates after which they could have been used by teachers.

Twenty-seven sources of information and provisions for responding to additional sources were presented to teachers for their consideration to ensure that some sources of influence or information would not be overlooked by them. These sources of information included personal and impersonal ones, sources which were local as well as those which were non-local, sources which required expenditures of time and money as well as those which did not, and sources which were within as well as outside agricultural education.

The instrument used with teachers was arranged so as to be as impersonal as possible, and to remove suspicion that the data would be used to evaluate a teacher and his program. The instrument also sought

to preclude receiving biased or "school answer" responses from teachers if they realized that this was a study pertaining to adoption and diffusion.

A two-way, forced-choice, comparison-of-pairs instrument was used to determine whether or not supervisors in each supervisory district could identify innovativeness among teachers of vocational agriculture. The rankings compiled by the investigator resulting from the use of this instrument were then compared with the innovativeness scores assigned each teacher. Spearman's rank correlation coefficients were used for this purpose. At no time were the supervisors provided with the innovativeness scores established for each teacher.

The instrument used to collect data from the teachers in the field was pre-tested in a supervisory district not part of the population sample. After revision, it was then administered in group-interview situations at regularly scheduled district meetings of teachers of vocational agriculture in February and March, 1965. Follow-up information was gathered from individual teachers wherever necessary during April, 1965.

Information provided by the respondents' instruments was checked for accuracy and usefulness, coded, and programmed for statistical treatment. Tests of significant differences involving Chi-square, analysis of variance by the means of the "F" test, and linear regression were made.

This study was based on the realization that the identification of the sources used by teachers of vocational agriculture to obtain information about educational innovations useful to them in teaching as well as the determination of the relative influence of these sources

could influence the content, methods, and emphasis provided in-service, pre-service, and supervisory programs of teacher education in agriculture.

Major Findings

The following are major findings of the study as they applied to the teachers involved. General findings are presented first and specific findings pertaining to the working hypotheses are presented separately.

General findings

1. In analyzing the findings, it was found that eight sources within agricultural education made up 76.45 per cent of all sources of information used. In descending order of frequency of use, the eight sources were: (1) state staff supervisors in agricultural education, (2) university department of agricultural education staff members, (3) annual conference for teachers of vocational agriculture, (4) other teachers of vocational agriculture, (5) non-credit workshops arranged for teachers of vocational agriculture, including district meetings, (6) visits to other departments of vocational agriculture, (7) graduate level courses, and (8) cooperating teachers.

2. The eight sources listed above were included in the nine sources most frequently mentioned by teachers as being used. The other source used, ranking fifth in importance, was that of administrators or supervisors in the local school system.

3. The most commonly cited reason for adopting the five practices investigated was that it was implied by state staff personnel

that this was the thing to do. The second most common reason was that the teacher had observed it being done somewhere else and thought that it was worth doing. Significant differences among adopter categories did not exist at the .05 level when the Chi-square test was applied to the reasons given for adopting the practices investigated.

4. Not being convinced of the value of a practice was the most common reason given for not adopting a particular practice.

5. One finding with implications for action by state staff personnel when working with the less innovative teachers was that 37.5 per cent of the laggards stated that the reason they were not using a particular practice was that they needed additional training in order to use the practice.

6. Another finding was that the more innovative the teacher was, the more likely he was to adopt a complex innovation, such as color dynamics, which had not been actively promoted by state staff personnel.

7. On the other hand, it was found that two practices which were practically mandated by state staff personnel, namely, the use of "Agdex" and a planned summer program of work, were adopted by over 93 per cent of the teachers.

8. Significant differences among adopter categories did not exist in respect to the length of time from awareness to adoption of the five practices studied. It was true, however, that the more innovative the individual was, the shorter was the period of time lag between awareness and adoption generally speaking.

9. The mean number of innovations adopted by teachers decreased progressively from the most innovative to the least innovative adopter category. However, the differences among the adopter categories in this regard were not statistically significant at the .05 level. The innovators, on the one hand, adopted 23.0 innovations; the laggards, on the other hand, had a mean adoption rate of 10.7 innovations.

10. The over-all degree of self-perception held by experienced teachers as to the time they would typically begin using a new teaching concept, activity, or educational practice in comparison with the other teachers in their district was statistically significant at the .01 level. It was also found that the more innovative the teachers were, the more likely they were to regard themselves as being a good source of advice about new practices in agricultural education. This finding was also significant at the .01 level. A larger percentage of early adopters, 2.3 times greater than the next highest categories, perceived themselves as actively attempting to convince others of new ideas or practices. This supported other findings that the early adopters, where opinion leaders are likely to be found, are conscious of the leadership role they play in their communities and realize that they must strive to hold that role if they are to maintain the respect of their peers.

11. One interesting finding was that those who entered the teaching profession after a practice was no longer being actively promoted and made highly visible simultaneously by several different sources of information or influences were less likely to adopt the given practice. This was exemplified by such practices as the use of

color dynamics in school farm mechanics shops and the use of plastic or glass sandwiches to preserve perishable or fragile teaching aids.

12. The more innovative the experienced teacher, the more likely he was to have classes for out-of-school youth and adult in operation. This finding was statistically significant at the .05 level.

13. Statistically significant differences did not exist in the number of non-credit professional workshops of more than one day's duration attended by members of the different adopter categories within the three years previous to the study.

14. Only 22.7 per cent of the teachers investigated were operating under a definite departmental budget. Statistically significant differences were not found to exist between members of the different adopter categories who did have budgets.

15. Considering age and opinion leadership, two structures were found to exist among the 101 teachers investigated. A small group of thirteen younger teachers existed who did not consider as opinion leaders those persons so considered by the majority of the teachers. Instead, those persons were considered more cautious or conservative and these thirteen men went to peers their own age for advice.

16. District supervisors, generally, could determine the degree of innovativeness exhibited by the teachers within their districts.

Specific findings related to the working hypotheses

1. The different sources providing information influencing the adoption of the five educational innovations studied varied according

to the adopter categories to which the teachers belonged but did not reach the .05 level of significance.

2. Significant differences did exist in the different sources used at the awareness stage, the interest stage, and the adoption stage of the innovation-adoption process.

3. The more innovative the experienced teacher was, the greater the use he was likely to make of impersonal sources of information.

4. The more innovative the experienced teacher was, the greater the use he was likely to make of sources outside of agricultural education.

5. Significant differences among adopter categories did not exist in regard to the use of non-local sources of information.

6. The more innovative the experienced teacher was, the greater the use he was likely to make of sources of information requiring large personal investments in time and money. The exception, though, was the innovator. He tended to be a "tightwad" in terms of spending his own money to make use of available sources of information.

7. The level of instructional expenditure per pupil in a school district did not furnish a clue as to where one could expect to find the more innovative or less innovative individuals. No appreciable differences among adopter categories existed. The tragically unrelated finding which emerged was the low mean instructional expenditure per pupil of $227.86 in the school districts involved in the study.

8. The members of the early majority category spent more personal money on materials for their own instructional programs than did members of the other categories. The laggards spent the least,

followed by the innovators, late majority, and early adopters in that order.

9. The mean age of each of the adopter categories increased progressively from the innovator through laggard categories. However, significant differences among the five adopter categories did not exist. The range for all categories was only 5.0 years.

10. The more innovative the experienced teacher was, the fewer the number of years of total teaching experience and the fewer the number of years of teaching experience in the present school system the teacher was likely to possess. These findings were found to progress directly from the most innovative to the least innovative but the differences among the different adopter categories were not significant at the .05 level.

11. The more innovative the experienced teacher was, the greater the amount of education he was likely to have obtained in a formal credit program since his initial certification. This finding was statistically significant at the .05 level.

12. The more innovative the experienced teacher was, the greater the amount of money he was likely to have invested in professional growth. This finding was also significant at the .05 level.

13. Teachers in all adopter categories possessed little occupational experience outside the teaching field. Differences among adopter categories did not exist which were significant. The mean number of years of experience outside the teaching field for all categories was 1.6 years.

14. The laggards definitely read fewer professional publications regularly than did the other adopter categories. However, the differences among the other four categories were minor and statistically significant differences among all five categories did not exist. Only 38.6 per cent of the teachers in the population sampled read their professional journal, The Agricultural Education Magazine, regularly.

15. The more innovative the experienced teacher was, the greater the number of professional visits to departments of instruction other than vocational agriculture he was likely to make on his own initiative.

16. The more innovative the experienced teacher was, the greater the number of non-local professional meetings he was likely to attend. This was true both for meetings attended within the state outside the county in which the teacher taught and for meetings attended outside the state.

17. The more innovative the experienced teacher was, the greater the number of professional visits to other departments of vocational agriculture he was likely to make on his own initiative.

18. The more innovative the experienced teacher was, the greater the degree of opinion leadership which he was likely to hold. This was true both for elective offices held by teachers within the three years prior to the collection of the data and nominations made by fellow teachers as to whom they would go for advice before using a new educational practice and from whom they would be willing to "borrow" a new teaching practice on the strength of the fact that they had observed a teacher using the practice. It was found also that all

fourteen of the early adopters were named by fellow teachers as being persons from whom they would "borrow" a new practice being used or to whom they would go for advice concerning new educational practices. Two of the innovators and only nineteen of the thirty-four teachers in the early majority category, categories on either side of the early adopter category, were so listed by fellow teachers. This bears out previous research that the early adopters are the greatest opinion leaders. The innovators possessed a greater degree of opinion leadership than was expected.

Conclusions and Implications

On the basis of the findings growing out of the data collected during this study and the accepted limits of significance set for this study, conclusions with their attendant implications were drawn by the investigator. Conclusions and implications pertaining to the working hypotheses are presented first. Other conclusions and implications pertaining to related findings are then presented. In the writer's judgment, the implications presented apply primarily to programs of teacher-education and supervision.

Conclusions and implications pertaining to working hypotheses

On the basis of the findings, it was concluded by the investigator that eight of the working hypotheses could be accepted as originally stated. Ten of the hypotheses as postulated at the

beginning of the study could not be accepted. The hypotheses which were accepted with their attendant implications were:

1. Experienced teachers of vocational agriculture are influenced by different sources at the awareness stage, the interest stage, and the adoption stage in the innovation-adoption process.

Implications.--State staff personnel cannot afford the luxury of depending on one or two sources to lead to the adoption of desirable innovations. By identifying all important sources, state staff members can utilize those sources extensively at the time and in the order in which their use will result in the greatest effectiveness and provide the greatest impact in influencing teachers to use new educational innovations. Also, an implication exists that systematic planning needs to be carried out to use these sources most efficiently. Then too, the implication exists that securing change must be considered a continual process involving multiple sources of information and influence.

2. The more innovative the experienced teacher is, the greater the use he is likely to make of impersonal sources of information.

Implications.--The development of more bulletins, instructional aids, teaching hints, and similar sources of information will be of value in speeding up the adoption process involving the more innovative individuals. A converse implication is that personal contacts cannot be forsaken when working with the less innovative individuals in the late majority and laggard categories.

3. The more innovative the experienced teacher is, the greater the use he is likely to make of sources outside of agricultural education.

Implications.--Persons in the position to do so--school administrators, supervisors, teacher-educators--should provide an opportunity for the more innovative teachers, especially those in the early adopter category, to use and take advantage of sources outside of agricultural education. Making it easy for teachers to use such outside sources would facilitate learning about new practices which possibly might be applicable to the school or classroom setting. Since the majority of teachers do not use outside sources, it is important that this means of injecting and diffusing new ideas obtained from outside the profession through the more innovative teachers be kept open. Those in the majority and laggard categories will follow the lead and actions of the more innovative teachers.

However, because most teachers tend to use overwhelmingly sources of information within their own field, such sources can serve as the vehicle of change in the change process. Another implication present is that personnel of the joint state staff can concentrate their efforts on purposive change within the framework of agricultural education.

4. The more innovative the experienced teacher is, the greater the amount of education he is likely to have obtained in a formal credit program since his initial certification.

Implications.--The question is not answered whether a person is more innovative because he has more postgraduate education or seeks more education because he is more innovative. But the implication exists that since a correlation exists between the two, a permissive climate should be fostered by school administrators and state staff

personnel which encourages teachers to continue their education without placing hurdles in their path. An example of such a hurdle might be a requirement that teachers on twelve-month contracts could absent themselves from their job only once in three years for purposes of securing additional education.

Another implication exists that finding out how much education teachers have obtained in a formal, postgraduate program of education will provide some hint as to how the more innovative individuals or the less innovative individuals may be identified. Thus the amount of postgraduate education possessed can serve as a general characteristic of innovativeness.

5. The more innovative the experienced teacher is, the greater the amount of money he is likely to have invested in professional growth.

Implications.--Again the question is not answered whether a person is more innovative since he engaged in activities which required him to invest personal money in professional growth or the more innovative teacher sought out those activities which required an investment in professional growth. This conclusion coupled with conclusion number four above gives rise to the implication that justification exists here for a teacher to be paid on a merit pay scale involving these two factors rather than adhering to a single step salary schedule tied to years of teaching experience. This assumes, of course, that innovativeness is acceptable and "good" in the eyes of those affected, whether they are teachers, administrators, board members, or state staff personnel.

6. The more innovative the experienced teacher is, the greater the number of other departments of vocational agriculture he is likely to visit on his own initiative.

7. The more innovative the experienced teacher is, the greater the number of professional visits to departments of instruction other than vocational agriculture he is likely to make on his own initiative.

8. The more innovative the experienced teacher is, the greater the number of non-local professional meetings he is likely to attend.

Implications.--Based on these three conclusions, it is apparent that the more innovative person does actively expose himself to or seeks out those sources of information which are removed from the realm of the day-to-day aspects of his job. Consequently, he is likely to make his teaching more lively and vital. Therefore, an implication exists that it would be wise for school boards and school administrators to establish policies permitting and encouraging short-term professional improvement activities. As an example, school policies might permit such activities as providing a paid substitute to free a person for a day to observe how a teacher in another school is conducting a specific program.

On the basis of the findings, it was concluded that three of the working hypotheses could not be accepted as they did not meet the .05 level of statistical significance set even though the findings approached this level, definitely were in the direction hypothesized, and were in accordance with the results of research studies in other

disciplines cited in the study. Those three hypotheses with their attendant implications were:

1. The more innovative the experienced teacher is, the younger he is likely to be.

Implications.--If substantiated by further research, the implication is present that if state staff personnel wish to seek out new ways of doing things that are being used in the field, they could consider finding out what the "better" younger teachers are doing. Another implication present, if substantiated by further research, is that relative youthfulness may be associated with innovativeness. Therefore, determination of age might provide a further clue on identifying the more innovative or the less innovative teachers.

2. The more innovative the experienced teacher is, the fewer the number of years of total teaching experience he is likely to possess.

Implications.--If substantiated by further research, an implication exists that here is another characteristic which may be useful in identifying innovativeness. Another implication which is present is that, if substantiated by further research, increasing teachers' salaries solely according to length of tenure may not be most equitable. Still another implication exists that state staff personnel need to give more responsibilities and opportunities for roles in leadership development to the younger teachers, especially those in the early adopter category. For example, some of these teachers could be involved as "demonstrators" at conferences and in the field.

3. The various sources which provide information that influences the adoption of educational innovations used by experienced teachers of vocational agriculture generally vary according to the adopter categories to which those teachers belong.

Implications.--If substantiated by further research, an implication exists that state staff personnel need to purposefully determine the degree of innovativeness held by teachers. This needs to be done in order for state staff members to utilize those sources which can be most effective in bringing about change on the part of teachers in the various adopter categories.

On the basis of the findings, it was concluded by the writer that four hypotheses could not be accepted even though the .05 level of statistical significance was met when the experienced teachers in the innovator and early adopter categories were combined into one category. Those working hypotheses and their attendant implications were:

1. The more innovative the experienced teacher is, the greater the use he is likely to make of sources of information which require large personal investments in time and money.

2. The more innovative the experienced teacher is, the larger the amount of personal money he is likely to spend on materials for his instructional program.

3. The more innovative the experienced teacher is, the greater the number of professional publications in education he is likely to read regularly.

4. With the exception of the members of the innovator category, the more innovative the experienced teacher is, the greater is the degree of opinion leadership which he is likely to hold.

Implications.--The most important implication present is that based on research evidence obtained by workers in other disciplines, the persons in this study identified as being innovators might not have been the true innovators. Instead, it might have been that there were no true innovators in the sample investigated and that what were caught in the net were the earliest of the early adopters. A second implication present is that, while recognizing that the small sample of innovators worked with was not large enough for checks on validity or reliability, it was quite possible that lack of preciseness in the data-gathering instrument used masked salient characteristics which could have been obtained. Consequently, it is evident that further research in means of distinguishing between the innovator and early adopter categories is needed.

It was concluded by the writer that three other hypotheses could not be accepted since they did not meet the .05 level of significance established for the investigation. These hypotheses and their implications were:

1. The more innovative the experienced teacher is, the greater the use he is likely to make of non-local sources of information.

Implication.--The implication is that teachers in the more innovative categories find that they can utilize local sources of information effectively and do not need to seek out non-local sources.

2. The more innovative the experienced teacher is, the greater is the amount of occupational experience he is likely to possess outside the teaching field.

Implications.--Since this hypothesis was rejected, occupational experience outside the teaching field is not seen as a characteristic of innovativeness. Consequently, it should not be used as such an indicator.

3. The more innovative the experienced teacher is, the greater is the likelihood that he will be teaching in a school with a relatively high instructional expenditure per pupil.

Implications.--Since this hypothesis was rejected, state staff personnel cannot assume that identifying systems with a high instructional expenditure per pupil will provide them with clues as to where the more innovative teacher is likely to be found.

Other conclusions and attendant implications

The following conclusions and attendant implications were derived from specific findings of this study.

1. The more innovative the experienced teacher is, the more he is likely to be influenced by the cooperating teacher under whom he received his experience as a student-teacher.

Implication.--Because these more innovative teachers tend to be the opinion leaders within the state, an implication exists that those persons selected as cooperating teachers should be the "pace-setters" for the profession in terms of new practices. In other words, their deeds are likely to be multiplied and to exert influence beyond the face-to-face contacts they have with student teachers working directly with them.

2. Opinion-leadership is applicable to a specific age span and does not encompass the complete range of ages of individuals within the professional group.

Implication.--Since younger teachers hold lesser opinions of respect about teachers accepted as opinion leaders by the majority of teachers than they do of individuals within their own age categories, an implication exists that state staff members should identify these emerging opinion leaders among this younger group of teachers and involve them on committees, in programs of pilot centers, and in other positions or activities where the influence they exert with their own peers can be used to lighten the efforts of the state staff in bringing about change.

3. Experienced teachers in the less innovative categories are influenced by their peers to a greater extent than are more innovative individuals.

Implication.--In attempting to wholesale efforts to create change by focusing attention on and working through opinion leaders in the early adopter categories, state staff personnel should not forget to include key members of the less innovative categories in the framework by which persons are made aware of, given additional information on, and influenced to adopt specific innovations. These less innovative persons need to be involved because of the direct personal influence they exert on peers within their respective adopter categories.

4. The less innovative the experienced teacher is, the less likely he is to adopt a given practice if he perceives that more training in the use of the practice is needed.

Implications.--For innovations perceived as requiring additional training to be widely adopted, in-service training programs stressing help in the use of such practices need to be implemented, especially for the less innovative teacher. Another implication existing is that state staff personnel should not be too critical of the failure of teachers to adopt certain practices until they have had an opportunity to become familiar with and proficient in the use of that practice.

5. It cannot be assumed that as new teachers enter the field they automatically are likely to adopt an already "established" practice which is considered desirable by state staff personnel.

Implication.--State staff personnel may periodically need to re-emphasize desirable practices by the use of a wide variety of sources of information and influence in order to maintain continual acceptance.

6. A given practice is most likely to be adopted by experienced teachers because it is implied by state staff personnel that this is the thing to do.

Implications.--State staff personnel could be more positive in their recommendations and exert greater leadership in actively attempting to bring about specific change within a state's program of agricultural education. An additional implication exists that "innovational packaging" by state staff personnel could bring about faster rates of adoption. It would seem that through demonstration, preparation of guidelines, concerted effort by both teacher-educators and state supervisors, and other means of visibility that teachers could be made aware of and convinced of the value of a given practice.

7. Experienced teachers who are opinion leaders among the earlier adopters actively and knowingly attempt to influence other teachers.

Implication.--State staff personnel could benefit by actively encouraging these teachers to use a given practice. They could be involved in establishing demonstration centers. The actions of these opinion leaders in attempting to convince others could help the attempts of state staff personnel to bring about change through the trickle-down process. Monetary incentives could be provided by state staff personnel to school districts for use in departments of vocational agriculture to encourage teachers to use a given practice.

8. Not as much difference in the characteristics exhibited by members of the early adopter, early majority, and late majority categories exists among experienced teachers as would be expected based upon research findings in other disciplines. If a normal curve could be visualized as the role model, one drawn to describe the differences in characteristics of the experienced teachers in this sample would be platykurtic. This is evidenced by the narrow range in years of teaching experience possessed by these three categories, the relative stability of the members within the profession, the narrow range in number of innovations adopted by the three groups, the narrow range in number of sources of information used within the field of agricultural education, the narrow range in the amount of personal money spent on materials for the instructional program within the teachers' area of responsibility, the narrow range in the number of professional publications read regularly, and the narrow range in number of elective offices held.

Implication.--Since the vast majority of experienced teachers possess characteristics which contribute to making up a rather uniform population when innovativeness is considered, the task of personnel on the state staff is lightened considerably when considering which sources should be utilized in securing planned change.

9. District supervisors can distinguish the relative degree of innovativeness possessed by teachers provided that they thoroughly understand the concept of innovativeness and its part in the change process and that they are well acquainted with the activities of the teachers within their respective districts.

Implications.--District supervisors could consciously and deliberately use persons in the different adopter categories according to the role they play and the position they hold among their peers to bring about desired, purposeful changes in agricultural education. For example, concentrated efforts could be made to utilize early adopters as cooperating teachers because of the high opinion-leadership role they play. Besides the early adopters, efforts could be made to include key members of the late majority in pilot programs since the latter individuals apparently exert a large degree of influence among their categorical peers as they maintain a larger number of face-to-face contacts within the category than they do with members of the more innovative categories.

10. Administrators and supervisors within the local school system exert relatively great influence on the adoption or non-adoption of educational innovations.

Implication.--State staff personnel and local school administrators or supervisors need to understand each other's objectives as well as work together in bringing about the adoption of desirable practices in a local system if increased effectiveness is to result through the change process. Apparently, this is especially true of the "average" teacher in the majority categories.

11. The annual conference exerts relatively great influence at the awareness stage of the adoption process having been used 1.7 times more often at this stage than at the interest stage and 3.6 times more often at the awareness stage than at the adoption stage for those practices actually adopted by teachers.

Implication.--The real purpose of the annual conference for teachers of vocational agriculture sponsored by the state's supervisory staff may be to make teachers aware of new developments, methods, techniques, and concepts rather than to "train" or "up-grade" them in specific methods or techniques.

12. The more innovative the experienced teacher is, the more likely he is to use non-mandatory sources of information.

Implications.--Because the more innovative teacher tends to use university staff members in agricultural education as sources of information and the less innovative teacher tends to use state supervisors as sources of information more frequently, an implication exists that both groups of personnel should work on promoting or upgrading the use of educational innovations within the state. Because of the visibility that promotion by more than one change agency provides, another implication exists that both groups should work out a

planned program for "packaging" the adoption of innovations through simultaneous upgrading, promotion, or in-service education.

13. Personal interviews would be a better technique to use in gathering data for a study of this type than the group interview technique.

Implications.--While the group interview technique used to collect data in this study yielded much valuable information and permitted recollection among the teachers themselves concerning the different sources of information used, it was not as precise a technique as a more lengthy, time consuming, personal interview would have been in which sensitive probing in depth for specific information would have been possible. Personal interviews with individual teachers combined with the group interview technique also might have afforded a better opportunity for gathering evidence pertaining to the adoption of each of the innovations studied.

Recommendations

The recommendations for further research listed herein are based on the findings and conclusions drawn from this study, the experience, and the impressions acquired by the writer in conducting the study. Also included are suggestions for improving this study in further replications.

Recommendations for further research

Several unanswered questions have arisen from the study of the sources of information influencing the adoption of different educational innovations. These questions as well as weaknesses in the

study which have become apparent provide the basis on which further worthwhile research efforts may be expended.

1. Now that a beginning has been made in understanding how experienced teachers of vocational agriculture are influenced to adopt or not adopt educational innovations, it would be helpful if this study could be replicated over a several-state area. Several reasons exist for doing this. First, it would provide a broader base for generalizing to the over-all population of experienced teachers on the basis of the findings which would result. Second, it would increase the certainty of including true innovators in the sample studied. A sample population of 1,000 experienced teachers should provide approximately twenty-five innovators whose characteristic behavior could be studied. Third, by including more innovators in the study, it would be possible to determine whether the hypotheses which could be explained and accepted with the exception of the innovator category were chance, or whether these were true situations which existed. Fourth, by increasing the number of teachers involved in the study, it would be possible, because of the attendant increase of supervisors involved, to make a better check on the ability of supervisors to determine the innovativeness of teachers with whom they worked. Also, it would be possible to compare the differences in influence on adoption of practices resulting from different procedures used by state staff personnel in the different states.

2. If further research along these lines is carried out, it is the recommendation of this investigator that ways be devised to determine whether or not district supervisors truly understand the concept

of innovativeness and the adoption process. It seems apparent that being able to identify innovativeness and understanding how the dynamics of the adoption process may be used to bring about purposeful change within a state could improve the effectiveness of the program of agricultural education within that state being promoted by state staff personnel. This seems especially important in view of the finding in this study that the major reason for adopting a practice was because it was implied by state staff personnel that this was the thing to do.

3. An area for separate investigation would be to find out why teachers in different adopter categories attended non-credit professional workshops. Was it to learn specific information and to become proficient in specific skills? Was it to avoid having to enroll in formal credit courses at an institution of higher education? Was it for different purposes depending on the adopter category to which a person belonged?

4. Another area for further research is to determine why undergraduate courses did not play a greater part in the adoption of educational innovations such as color dynamics since students had been exposed to this type of practice as undergraduates; only 2.29 per cent of the respondents in this study listed undergraduate courses as being important sources of information.

5. One aspect of innovativeness was not considered in the current study and should be investigated, namely, if teachers of vocational agriculture discontinued the use of educational innovations, why did they do so? What was the relative importance of different

sources of information on such discontinuances? Does adoption occur at a faster rate than discontinuance? If so, what are the effects on educational programs?

6. One need for further research is to determine the reasons why teachers who did not adopt a particular innovation said that they "were not convinced of its value." Was this the true answer, or was this a "smoke screen" reason which was easy to give but in reality hid other reasons?

7. Another need for research is to determine whether innovativeness among teachers of vocational agriculture is associated with intelligence and the ability to deal with abstractions or complex mental tasks. Was the high correlation that existed in two of the districts reported in this study between teachers' innovativeness scores and the speed with which they completed the complex, legal-length, fourteen-page, data-gathering instrument a mere coincidence? Is there a correlation between such measures as I.Q., college grade averages, or class academic standing and innovativeness?

8. Why was there such a short lag in time between awareness and adoption of the educational practices studied? This was in apparent contradiction with other research findings. Can we find out exactly when teachers became aware of practices during their undergraduate preparation which they then adopted after going on the job? Was this short lag true or did it reflect teachers not being able to recall accurately and tending to give an answer which would make them look good? This needs to be investigated further.

9. Perhaps the greatest difficulty encountered in the design of this investigation was identifying clear, sharp, representative educational innovations or "innovational packages" that individual teachers could adopt without being influenced by forces beyond their control. Do such innovations in agricultural education exist? Or should we admit that the individual teacher cannot operate independently of the school setting in which he works and that we must consider the innovativeness of the school, community, and teacher together when attempting to identify ways of speeding up the adoption process and creating desirable changes in local programs of vocational agriculture? How do we determine exactly what changes the state staff are actively and purposely promoting? These are areas requiring further research.

10. Is there any way of determining whether or not experienced teachers of vocational agriculture tend to be more or less conservative than other members in a society? The reason this question is raised is because of the narrow range in differences between the members of the early adopter, early majority, and late majority categories that were apparent in this study. Also, the relative stability of the experienced teachers in terms of tenure, both in the profession and in the present school system, causes this question to be asked since this is sometimes associated with innovativeness. This, too, is an area for further investigation.

11. A major problem for further research is to determine the effects on the opinion leaders in the early adopter category of their use by state staff change agents to speed up the adoption of educational

innovations. If they become identified as "outlets" for the state staff in the eyes of their peers, will their channels of communications to other teachers in the state dry up? Will they lose their influence and role as opinion leaders?

12. Determining if practices which have been accepted by the vast majority of teachers, such as "Agdex," were accepted because they were "mandated" or were accepted because of the way in which they were "packaged" and presented to teachers is another area for further research.

13. One area for further research is to continue to devise means of identifying innovators among teachers of vocational agriculture.

14. If the persons considered innovators in this study are really innovators, why did they tend to be "tightwads" when it came to using their own money? This should be investigated.

15. Another need for research is to determine if adopter categories exist by "age groups" within a social system such as teachers of vocational agriculture. If so, what are the parameters? This further research is indicated growing out of the conclusion that opinion-leadership, often associated with innovativeness, is applicable to a specific age span and does not encompass the complete range of ages of individuals within the professional group.

16. Finally, those hypotheses which were not accepted in this study because they did not meet the levels of statistical significance established by the investigator should be retested.

Specific recommendations for improving a study of this type

The recommendations in this section pertain to improving the procedures used to collect data from teachers if this type of study is carried out again. One apparent value of the group interview technique used was that in many cases teachers were able to check with others present to determine such things as the date when and place where such-and-such a practice was demonstrated, when a particular teachers' conference was held, and who sent out information from the state office about a specific practice. However, the writer believes that it would be best to use personal interviews probing in depth to collect evidence pertaining to the accuracy of responses made concerning the adoption of specific innovations. The same general type of data-gathering instrument used in this study modified for personal interviews would be appropriate. However, the following suggestions would probably improve the effectiveness of the instrument:

1. Use the same sources of information listed in the instrument with the exception that the source entitled, "non-credit workshops for vo-ag teachers" should be divided into two categories, namely, "non-credit workshops of one day or longer in duration," and "district meetings for teachers of vocational agriculture less than one day in length." Also, another source should be added entitled, "trial use of the practice." These additions would increase the preciseness of the instrument.

2. Eliminate the innovativeness simulation problem incorporated as item "E" of Part V of the instrument as, in its present form, it

did not provide a measure of innovativeness. A simulation problem ideally might be an objective form of measuring innovativeness, but developing items which are perfectly correlated with degrees of innovativeness is extremely difficult.

3. When asking how many departments of instruction, either of vocational agriculture or of other subject-matter areas, were visited within the past year, ask how many were visited "purposefully."

4. Even though other studies on the adoption and diffusion of innovations in other disciplines have been made using only one or two innovations as the vehicles of investigation, this investigator was pleased with the cumulative reinforcement of responses obtained with using five different innovations. He would not recommend using less than five practices in a similar study.

5. Not asking for personal data until most of the information desired had been obtained as was done in this study by placing the face data on the last page of the instrument helped bring a greater degree of objectivity into the study. It was not until respondents began answering questions in Part VII on page 13 pertaining to the identification of teachers within and outside of the district who would be good sources of advice, who would be the first to use a new practice, etc., that some of them commented that this was a study on adoption and diffusion. Consequently, the writer believes that the present arrangement of the instrument did lend itself to neutrality and objectivity of response.

6. In replicating this study, the writer would also find out how many books and what type of books each teacher possessed in his

personal library. The writer learned after this study was underway that Mort and Cornell had found that a correlation existed between the size and type of personal library owned by a teacher and his innovativeness.

7. The investigator would also attempt to determine if a correlation existed between the amount of "general education" acquired by the teacher in his college career and the degree of innovativeness he exhibited.

8. The investigator would also attempt to determine if a correlation existed between the number of teaching positions held in various school systems and innovativeness.

Concluding Statement

This study represented but a single attempt to determine the relative influence of selected sources of information affecting the adoption of specific educational innovations among experienced teachers of vocational agriculture in Ohio. However, it was apparent from the findings that a fertile field had been tapped containing many implications for accelerating and improving the effectiveness of the change process by which state staff personnel may improve the outcomes of programs of vocational agriculture in local schools.

B I B L I O G R A P H Y

BIBLIOGRAPHY

Books

Arensberg, Conrad M. and Niehoff, Arthur H. Introducing Social Change: A Manual for Americans Overseas. Chicago: Aldine Publishing Co., 1964.

Bennis, Warren G., Benne, K. D., and Chin, Robert. The Planning of Change. New York: Holt, Rinehart and Winston, 1962.

Blau, Peter M. and Scott, W. Richard. Formal Organizations: A Comparative Approach. San Francisco: Chandler Publishing Co., 1962.

Bright, James R. Research, Development, and Technological Innovation. Homewood, Illinois: Richard D. Irwin, Inc., 1964.

Cook, Glen C. Handbook on Teaching Vocational Agriculture. Danville, Illinois: Interstate Printing Co., 1947.

Cook, Glen C. and Walker, Clyde. Practical Methods in Teaching Farm Mechanics. Danville, Illinois: Interstate Printing Co., 1947.

Davis, John Herbert and Goldberg, Ray A. A Concept of Agribusiness. Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1957.

Katz, Elihu and Lazarsfeld, Paul F. Personal Influence. Glencoe, Illinois: The Free Press, 1955.

Lionberger, Herbert F. Adoption of New Ideas and Practices: A Summary of the Research Dealing with the Acceptance of Technological Change in Agriculture, with Implications for Action in Facilitating Social Change. Ames, Iowa: Iowa State University Press, 1960.

Miles, Mathew B. Innovation in Education. New York: Columbia University Teachers College Bureau of Publications, 1964.

Mort, Paul R. and Cornell, Francis G. Adaptability of Public School Systems. New York: Columbia University Teachers College Bureau of Publications, 1938.

Mort, Paul R. and Cornell, Francis G. American Schools in Transition. New York: Bureau of Publications, Columbia University, 1941.

Mort, Paul R. and Pierce, Truman A. A Time Scale for Measuring the Adaptability of School Systems. New York: Columbia University Teachers College, Metropolitan School Study Council, 1947.

Mort, Paul R. and Ross, Donald H. Principles of School Administration: A Synthesis of Basic Concepts. New York: McGraw-Hill Book Company, Inc., 1957.

Rogers, Everett M. Diffusion of Innovations. New York: The Free Press of Glencoe, 1962.

Ross, Donald H. Administration for Adaptability: A Source Book Drawing Together the Results of More than 150 Individual Studies Related to the Question of Why and How Schools Improve. New York: Metropolitan School Study Council, 1958.

Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Company, Inc., 1956.

Walker, Helen M. and Lev, Joseph. Statistical Inference. New York: Holt, Rinehart and Winston, 1962.

Bulletins

Beal, George M. and Rogers, Everett M. The Adoption of Two Farm Practices in a Central Iowa Community. Department of Economics and Sociology Special Report 26. Ames, Iowa: Iowa Agricultural and Home Economics Experiment Station, June, 1960.

Bishop, Rowland and Coughenour, C. Milton. Discontinuance of Farm Innovations. Department of Agricultural Economics and Rural Sociology Department Series A.E. 361. Columbus, Ohio: The Ohio State University, April, 1964.

Carlson, Richard O. Change Processes in the Public Schools. Eugene, Oregon: The Center for the Advanced Study of Educational Administration, University of Oregon, 1965.

Education: An Investment in People. Washington, D.C.: Chamber of Commerce of the United States, 1964.

Fliegel, Fredrick C. and Kivlin, Joseph E. Differences Among Improved Farm Practices as Related to Rates of Adoption. Agricultural Experiment Station Bulletin 691. University Park, Pennsylvania: Pennsylvania Agricultural Experiment Station, January, 1962.

Havens, A. Eugene. A Review of Factors Related to Innovativeness. Department of Agricultural Economics and Rural Sociology, Mimeo Bulletin A.E. 329. Columbus, Ohio: Ohio Agricultural Experiment Station, 1962.

Hess, C. V. and Miller, J. F. Some Personal, Economic, and Sociological Factors Influencing Dairymen's Actions and Success. Agricultural Experiment Station Bulletin 577. University Park, Pennsylvania: Pennsylvania State University, 1954.

Rapid Method for Determining Significance of the Difference Between Two Percentages. Agricultural Experiment Stations Circular 151, Pullman, Washington: Washington Agricultural Experiment Station, July, 1962.

Rogers, Everett M. Bibliography of Research on the Diffusion of Innovations. Department of Communication, College of Communication Arts, Research Report 1. East Lansing, Michigan: Michigan State University, July, 1964.

Rogers, Everett M. Supplementary Bibliography of Research on Diffusion of Innovations. Department of Communication, College of Communication Arts. East Lansing, Michigan: Michigan State University, October, 1964.

Rogers, Everett M. Characteristics of Agricultural Innovators and Other Adopter Categories. Agricultural Experiment Station Research Bulletin 882. Wooster, Ohio: Ohio Agricultural Experiment Station, May, 1961.

Rogers, Everett M. and Burdge, Rabel J. Community Norms, Opinion Leadership, and Innovativeness Among Truck Growers. Agricultural Experiment Station Research Bulletin 912. Wooster, Ohio: Agricultural Experiment Station, 1962.

Rogers, Everett M. and Burdge, Rabel J. Muck Vegetable Growers: Diffusion of Innovations Among Specialized Farmers. Research Circular 94. Wooster, Ohio: Ohio Agricultural Experiment Station, 1961.

Rogers, Everett M. and Capener, Harold R. The County Extension Agent and His Constituents. Research Bulletin 858. Wooster, Ohio: Ohio Agricultural Experiment Station, 1960.

Rogers, Everett M. and Havens, A. Eugene. Extension Contact of Ohio Farm Housewives. Agricultural Experiment Station Research Bulletin 890. Wooster, Ohio: Ohio Agricultural Experiment Station, November, 1961.

Rogers, Everett M., Havens, A. Eugene, and Cartano, David G. The Construction of Innovativeness Scales. Department of Agricultural Economics and Rural Sociology, Mimeo Bulletin A.E. 330, Columbus, Ohio: Ohio Agricultural Experiment Station, February, 1962.

Rogers, Everett M. and Pitzer, R. L. The Adoption of Irrigation by Ohio Farmers. Research Bulletin 851. Wooster, Ohio: Ohio Agricultural Experiment Station, 1960.

Rogers, Everett M. and van Es, Johannes C. Opinion Leadership in Traditional and Modern Columbian Peasant Communities. Department of Communication, College of Communication Arts, Diffusion of Innovations Research Report 2. East Lansing, Michigan: Michigan State University, October, 1964.

Rogers, Everett M. and Yost, M. D. Communication Behavior of County Extension Agents. Experiment Station Research Bulletin 850. Wooster, Ohio: Ohio Agricultural Experiment Station, February, 1960.

Subcommittee for the Study of Diffusion of Farm Practices. Adopters of New Farm Ideas: Characteristics and Communications Behavior. North Central Regional Extension Publication 13. East Lansing, Michigan: Michigan State University, Cooperative Extension Service, 1962.

Subcommittee for the Study of Diffusion of Farm Practices. How Farm People Accept New Ideas. North Central Regional Extension Publication 1. Ames, Iowa: Agricultural Extension Service, Iowa State College, 1955.

Vocational and Technical Education: A Review of Activities in Federally Aided Programs, Fiscal Year 1963. United States Department of Health, Education, and Welfare, Office of Education Bulletin OE-80008-63. Washington, D.C.: U. S. Government Printing Office, 1964.

Wilkening, Eugene A. Acceptance of Improved Farm Practices in Three Coastal Plain Counties. Experiment Station Technical Bulletin 98. Raleigh, North Carolina: North Carolina Agricultural Experiment Station, 1952.

Articles and Periodicals

Abell, Helen C. "The Use of Scale Analysis in a Study of the Differential Adoption of Homemaking Practices," Rural Sociology, XVII (1952), 161-167.

Beal, George M. and Rogers, Everett M. "Informational Sources in the Adoption Process of New Fabrics," Journal of Home Economics, XLIX (1957), 630-634.

Beal, George M., Rogers, Everett M., and Bohlen, Joe M. "Validity of the Concept of Stages in the Adoption Process," Rural Sociology, XXII (1957), 166-168.

Belcher, John C. "Acceptance of the Salk Polio Vaccine," Rural Sociology, XXIII (1958), 158-170.

Bohlen, Joe M. "The Adoption and Diffusion of Ideas in Agriculture," in James H. Copp (ed.), Our Changing Rural Society: Perspectives and Trends. Ames, Iowa: Iowa State University, 1964.

Brickell, Henry M. "The Dynamics of Educational Change," Theory Into Practice, I (April, 1962), 81-88.

Copp, James H., Sill, Maurice L., and Brown, Emory J. "The Function of Information Sources in the Farm Practice Adoption Process," Rural Sociology, XXIII (1958), 146-157.

Culbertson, Jack (ed.). Theory Into Practice: Changing the School, II, No. 5 (December, 1963). Bureau of Educational Research and Service. Columbus, Ohio: The Ohio State University.

Duncan, James A. and Kreitlow, Burton W. "Selected Cultural Characteristics and the Acceptance of Educational Programs and Practices," Rural Sociology, XIX (1954), 349-357.

Eichholz, Gerhard C. "Why Do Teachers Reject Change?" Theory Into Practice, II (1963), 264-268.

Eichholz, Gerhard and Rogers, Everett M. "Resistance to the Adoption of Audio-Visual Aids by Elementary School Teachers: Contrasts and Similarities to Agricultural Innovation," in Innovation in Education. New York: Teachers College Columbia University, 1964.

Fliegel, Frederick C. "A Multiple Correlation Analysis of Factors Associated with Adoption of Farm Practices," Rural Sociology, XXI (1956), 284-292.

Gross, Neal C. and Taves, Marvin J. "Characteristics Associated with Acceptance of Recommended Farm Practices," Rural Sociology, XVII (1952), 321-328.

Hoffer, Charles R. and Stagland, Dale. "Farmers' Attitudes and Values in Relation to Adoption of Approved Practices in Corn Growing," Rural Sociology, XXIII (1958), 112-120.

Katz, Elihu. "The Diffusion of New Ideas and Practices," in The Science of Human Communication. New York: Basic Books, 1963.

Katz, Elihu, et al. "Traditions of Research on the Diffusion of Innovations," American Sociological Review, XXVII (1963), 237-253.

Lionberger, Herbert F. "Some Characteristics of Farm Operators Sought as Sources of Farm Information in a Missouri Community," Rural Sociology, XXVIII (1953), 327-338.

Marsh, Paul and Coleman, A. Lee. "Farmers' Practice-Adoption Rates in Relation to Adoption Rates of 'Leaders,'" Rural Sociology, XIX (1954), 180-181.

Marsh, Paul C. and Coleman, A. Lee. "The Relation of Neighborhood of Residence to Adoption of Recommended Farm Practices," Rural Sociology, XIX (1954), 385-389.

Mason, Robert G. "The Use of Information Sources in the Process of Adoption," Rural Sociology, XXIX (1964), 40-52.

Mayo, Selz C. "An Analysis of the Organizational Role of the Teacher of Vocational Agriculture," Rural Sociology, XXV (1960), 334-345.

Menzel, Herbert and Katz, Elihu. "Social Relations and Innovation in the Medical Profession: The Epidemology of a New Drug," Public Opinion Quarterly, XIX (1955-56), 337-352.

Ramsey, Charles E. and Polson, Robert A., and Spencer, George E. "Values and the Adoption of Practices," Rural Sociology, XXIV (1959), 35-47.

Rogers, Everett M. and Beal, George M. "The Importance of Personal Influence in the Adoption of Technological Changes," Social Forces, XXXVI (1958), 329-335.

Rogers, Everett M. and Rogers, L. Edna. "A Methodological Analysis of Adoption Scales," Rural Sociology, XXVI (1961), 325-336.

Ryan, Bruce and Gross, Neal C. "The Diffusion of Hybrid Seed Corn in Two Iowa Communities," Rural Sociology, VIII (1943), 15-24.

Wilkening, Eugene A. "A Sociopsychological Approach to the Study of the Acceptance of Innovations in Farming," Rural Sociology, XV (1950), 352-364.

Wilkening, Eugene A. "Sources of Information for Improved Farm Practices," Rural Sociology, XV (1950), 19-30.

Young, James N. and Coleman, A. Lee. "Neighborhood Norms and the Adoption of Farm Practices," Rural Sociology, XXIV (1959), 372-380.

Reports

Balzer, David M. (ed.). Directory of Innovations in Teacher Education. Prepared for use in The Columbus Teacher Education and Professional Standards Conference, June 25-28, 1963. Washington, D.C.: National Education Association, 1963.

Costs Per Pupil in Average Daily Membership in Ohio's City, Exempted Village and County School Districts From July 1, 1962 to June 30, 1963. Division of Research, Ohio State Department of Education, 1963.

Fox, Rogert, et al. "The Introduction and Spread of Teaching Innovations to Promote Classroom Mental Health and Learning Efficiency," Research project under way at University of Michigan Institute for Social Research, Ann Arbor, Michigan, 1961.

McComas, J. D. (ed.). New Programs in Agricultural Education: Pacific Region Report, Los Angeles - April, 1963. Agricultural Education Publication 105. University Park, New Mexico: New Mexico State University, July, 1963.

Meierhenry, W. C. (ed.). Media and Educational Innovation: A Symposium on Identifying Techniques and Principles for Gaining Acceptance of Research Results of Use of Newer Media in Education. Preliminary Report. Lincoln, Nebraska: The University of Nebraska in Cooperation with the U. S. Office of Education, June 27, 1963 - September 30, 1964.

Panel on Educational Research and Development. Innovation and Experiment in Education. A Progress Report of the Panel of Educational Research and Development to the U. S. Commissioner of Education, the Director of the National Science Foundation, and the Special Assistant to the President for Science and Technology. Washington, D.C.: U. S. Government Printing Office, March, 1964.

Rogers, Everett M. Comparative Study of the Process of Innovation: Information Sources in the Adoption Process for 2, 4-D Weed Spray in Three Columbian Peasant Neighborhoods. Paper presented at the First Inter-American Research Symposium on the Role of Communications in Agricultural Development, Mexico City, Mexico, October 5-13, 1964.

Unpublished Material

Allen, Harley Earl. "The Diffusion of Educational Practices in the School Systems of the Metropolitan School Study Council," Ed.D. thesis, New York, Teachers College, Columbia University, 1956.

Baker, Jasper N. "A Study of the Relative Effectiveness of Sources from Which Farmers Get Information Regarding Agricultural Station Results." Ph.D. thesis, Minneapolis, Minnesota, University of Minnesota, 1954.

Cocking, Walter. "The Regional Introduction of Educational Practices in Urban School Systems in the United States." Institute of Administrative Research Study 6, New York, Teachers College, Columbia University, 1951.

Coughenour, C. Milton. "The Problem of Reliability of Adoption Data in Survey Research." Unpublished paper, Department of Agricultural Economics and Rural Sociology, Columbus, Ohio, The Ohio State University, 1964.

Eichholz, Gerhard C. "Development of a Rejection Classification for Newer Educational Media." Ph.D. thesis, Columbus, Ohio, The Ohio State University, 1961.

Francis, David G. "Communication Credibility of a Nonrecommended Innovation." M.S. thesis, Department of Agricultural Economics and Rural Sociology, Columbus, Ohio, The Ohio State University, 1960.

Francis, David G. and Rogers, Everett M. "Adoption of a Nonrecommended Innovation: The Grass Incubator." Paper presented at the Rural Sociological Society, University Park, Pennsylvania, 1960.

Guiler, Gilbert S. "The Use of Professional Time During the Summer Months by Teachers of Vocational Agriculture in Ohio." Ph.D. thesis, The Ohio State University, 1959.

Hundley, James R. "The Validity of Farm Practices Adoption Measures." M.S. thesis, Madison, Wisconsin, University of Wisconsin, 1962.

Lionberger, Herbert F. "The Diffusion of Innovations with Applications from Agricultural Research to Implemented Change in School System." Paper presented at the Association for Supervision and Curriculum Development Seminar on Strategy for Curriculum Change, New Orleans, Louisiana, January, 1965.

Mason, Robert George. "Information Source Use in the Adoption Process." Ph.D. thesis, Palo Alto, California, Stanford University, 1962.

Pelley, James H. "Invention in Education," Ed.D. thesis, Columbia University, Teachers College, 1948.

Other Sources

_____. Personal interview with C. Milton Coughenour, Visiting Professor, Department of Agricultural Economics and Rural Sociology, The Ohio State University, Columbus, Ohio. October 14, 1964.

_____. Personal interview with Robert Dimit, Professor, Department of Agricultural Economics and Rural Sociology, The Ohio State University, Columbus, Ohio. October 14, 1964.

_____. Personal interview with Daryl Hobbs, Associate Professor, Department of Rural Sociology, University of Missouri, Columbia, Missouri. August 12, 1965.

_____. Personal interview with Everett M. Rogers, Associate Professor of Rural Sociology, Department of Communication, Michigan State University, East Lansing, Michigan. October 27, 1964.

The Future Farmer of Today is the Successful Farmer of Tomorrow! Alexandria, Virginia: National Future Farmer, 1963.

END