

Do Extension Adult Education Participants Use What They Are Taught?

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Abstract

Many agricultural faculty members are called upon to teach in Extension adult education programs. Teaching implies bringing about learning and learning can be defined as changing behavior. One dimension of behavioral change is the actual "use" or application of the knowledge and skills taught/learned. Predicting whether or not participants would "use" what was taught would be a complex issue requiring a multivariate or conceptual model. Researchers need to begin to conceptualize and test such models if the evaluation/accountability of Extension programs are to move beyond mere records of attendance and begin to address issues related to providing problem solving abilities (higher order cognition) and practical usage.

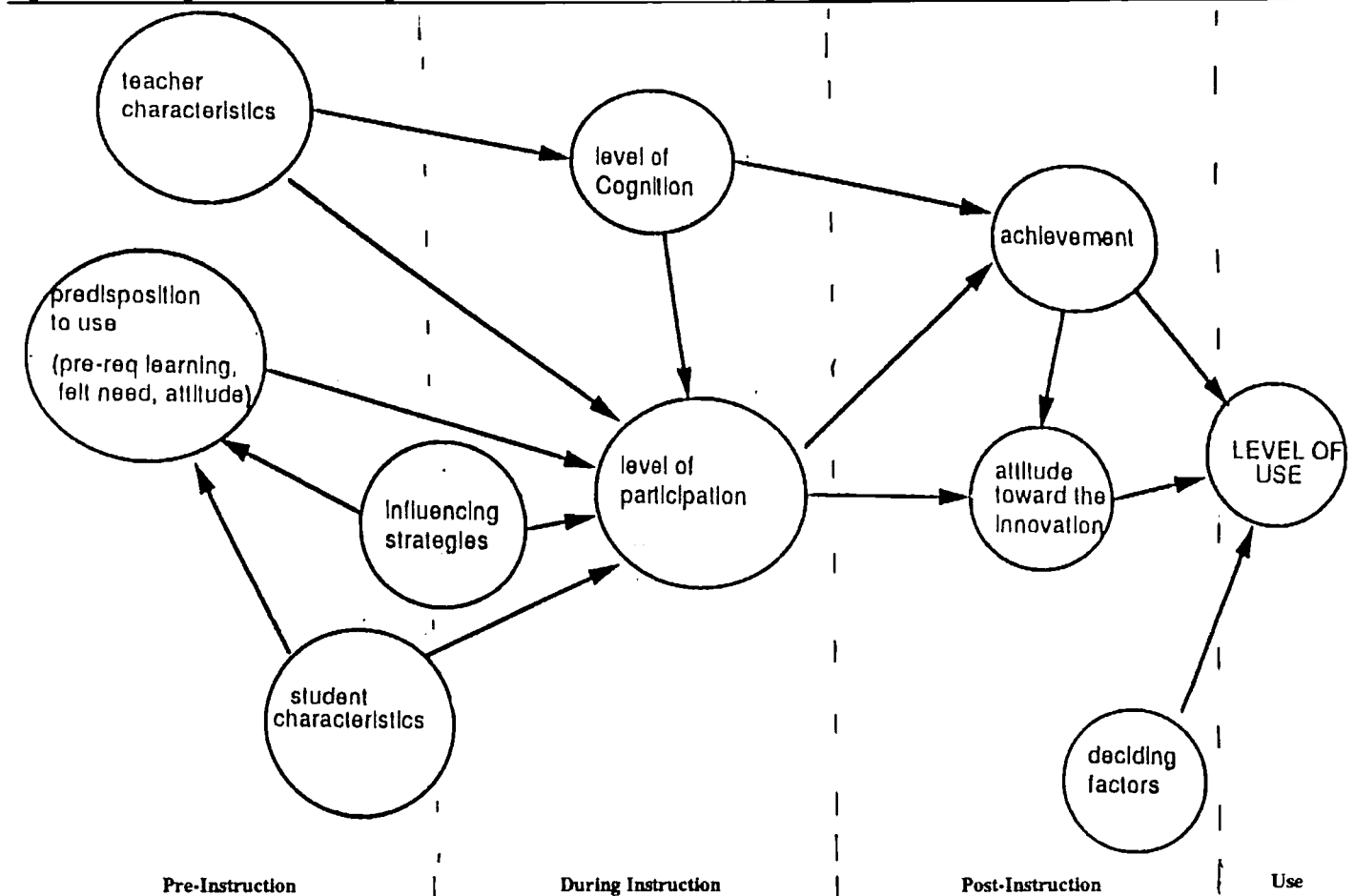
Most educational programs are conducted to provide learning opportunities for the participants with the expecta-

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tions that any knowledge, skill or attitude gained will be utilized. Little is known, however, regarding whether clients ever use the information offered in adult agricultural education programs given by the Cooperative Extension Service (CES). If Extension educators better understood the relationships among instructor, student and classroom characteristics and the outcomes of adult education, possibly knowledge transfer and utilization would improve.

The purpose of the study was to describe a wide variety of variables related to adult agricultural education for a sample of Ohio Cooperative Extension Service (OCES) programs. The variables were categorized into three groups: (1) existing before instruction, (2) occurring during instruction and (3) existing/occurring after instruction. "Level of use of the innovation" was the ultimate outcome in the model developed for the study (Figure 1). "Use" was considered synonymous with the term "transfer" from psychology, "change" from sociology, and "technology transfer" and "application" from other arenas. Numerous

Figure 1. Working Model of Knowledge Transfer and Utilization in Adult Agricultural Education.



researchers (Love, 1985; Boruch & Cordray, 1980; Sieber, 1981; Fullen, 1981; Lehming, 1982; Bloom, Hastings & Madaus, 1971; Rogers, 1983) have investigated and/or conceptualized these constructs. Applying them to Extension education, the question emerges: "Do clients utilize the instruction they receive?"

Objectives

The objectives of this study were:

- 1) To describe the status of a sample of OCES programs with respect to the variables in the model, with special emphasis on level of cognition of instruction and level of use of the innovation.
- 2) To investigate possible relationships among the variables in the model.

Procedures

The population for the study included all OCES adult programs in production agriculture, farm business management and horticulture. A random sample of 9 classes was visited by the researchers. Three of the nine classes were pesticide recertification programs, required by the state for those farmers wishing to be certified to use restricted pesti-

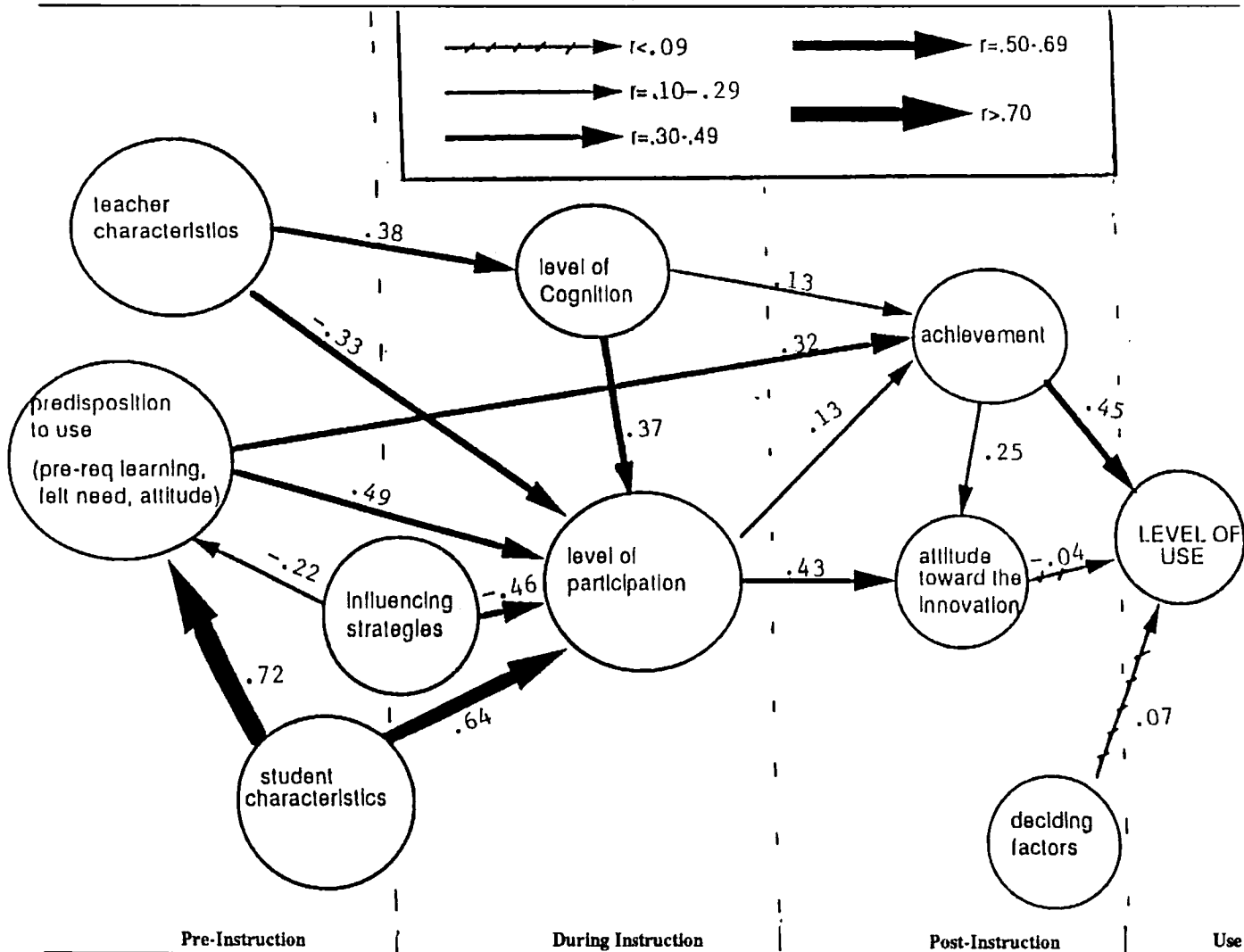
cides. This sample size was suitable to generate data to test the model presented here, but too small to generalize.

The study employed a variety of methodologies, including personal interviews, classroom observations and mail questionnaires to obtain descriptive information regarding the programs. Overall, of 129 participants surveyed by mail to determine later "use", 82 responded after an initial and a follow-up mailing. The final response rate was 64 percent and would limit the generalizability to respondents. Reliability (Cronbach's α for internal consistency) of the pre-instruction and post-instruction questionnaires were .76 and .88, respectively. Content validity was established by a panel of experts for the questionnaires. To assess intended and actual levels of cognition, the Florida Taxonomy of Cognitive Behaviors (FTCB) was used which was scored with 1 = knowledge, 2 = translation, 3 = interpretation, 4 = application, 5 = analysis, 6 = synthesis, and 7 = evaluation, with intra-rater reliability of 99%.

Findings and Conclusions

The first objective of the study was to describe the status of a sample of adult agricultural education classes in Ohio. Instructors had an average of 13 years of experience teach-

Figure 2. Strength of the Correlations in the Model of Knowledge Transfer and Utilization in Adult Agricultural Education.



ing adults and eight of the nine had some graduate education. Students enrolled in production agriculture and farm business management classes were predominantly male, while more than one-half of the students enrolled in horticulture classes were female. The average student had some education beyond high school and the average age of the students was about 45 years, with a wide range from 19 to 72 years.

The remaining variables were measured using Likert-type summated scales, with 1 = strongly disagree to 4 = strongly agree; thus, higher scores indicated higher perceived levels of previous learning, felt need, positive attitude, previous achievement, etc. Respondents scored positively on prerequisite learning, felt need and attitude toward learning/change, indicating that, in general, students were well-disposed toward learning.

Results from the mail questionnaire indicated that the average rating was 3.1 (sd=0.6) on perceived achievement and scored a mean of 3.4 (sd=0.7) on attitude toward the educational innovation offered. Self-ratings on available resources and outside influences were 2.8 (sd=0.5) and 2.4 (sd=0.6), respectively. Overall "level of use of the innovations" (the mean of either two or three different innovations for each class) had a mean of 3.0 (sd=1.0), indicating "some use" on a scale where 1=no use and 5=had improved upon use.

Instructors' intended level of cognition for their programs produced a mean of 4.8 (application) and the actual level of cognition for the instruction was somewhat higher at 5.2 (analysis). Only two classes reached the evaluation level. Level of participation ranged from one to 33 interactions per hour, with an average of 16.1. The pesticide training classes had a significantly lower intended level of cognition (3.0, interpretation) and a very low level of participation (2.7 interactions per hour), indicating almost a total lack of participation on the part of the students.

Two of the lowest "level of use" scores were for the use of FINPACK (1.83) and Lotus 123 (2.25). Both these computer programs for financial management are costly and require the user to own or have access to a home computer. The highest "level of use" ratings were for narrow rows in soybeans (4.00) for reading pesticide labels (3.80 and 4.00) and calibration of sprayers (3.80 and 4.50). These practices are well known and widely used by Ohio farmers. The importance of use for these programs was well documented during instruction and illustrated by slides, video tapes and brochures.

The second objective of the study was to investigate possible relationships among variables. Figure 2 illustrates the results when individuals were treated as the unit of analysis (n=235). Using the conventions established by Davis (1971) for describing the magnitude of correlations, the following statements can be made. A moderate negative correlation existed between influencing strategies and participation ($r=-0.46$), supporting the observation that when students were required to attend the pesticide training classes, they did not join in discussion or ask questions about the topic. An unexpected finding was the moderate

positive relationship between "predisposition to use" and deciding factors ($r=.35$). Possibly, students with less constraints upon use were more likely to pursue knowledge regarding change.

The three variables expected to be strongly related to "level of use" had low positive correlations with overall "level of use". The only moderately strong relationship was found between deciding factors and "level of use" among production agriculture classes -- this could be due entirely to the very high correlation found in one class on grazing management ($r=.89$), whereas for all classes $r = .07$.

Discussion

The model developed for the study appeared to hold when individuals were treated as the unit of analysis. The model, therefore, should be useful for future investigations of adult education in agriculture, and possibly for general programs in adult education.

Description of "level of use" was made more difficult by the fact that each classroom was offering different innovations to students -- mean values have less meaning than would individual scores. "Level of use" was lowest when use would have required students to purchase computer software packages.

Although the model held overall, the correlations found among the variables were lower than expected. One explanation could be the self-selection of participants, leading to limited variance in education, attitude, felt need and predisposition to use. "Level of use" was related positively to perceived achievement, but level of use was influenced by something other than the three variables included in the model -- what these variables could be is still open to question. In-depth interviews planned for a longitudinal study might uncover additional influential variables.

Future research efforts should focus on (1) the unique patterns of the relationships among the variables in the model of knowledge transfer and utilization that describe any given subject area or type of program in Extension education, and (2) consider how "level of use" might be measured in a qualitative fashion, and/or how might a quantitative approach improve observations over the self-reporting technique used for this study.

Less experienced instructors tended to provide more student-centered, interactive instructional modes which encouraged student participation. Knowles (1984) elaborated upon the philosophies of Socrates, Dewey, Piaget and Vygotsky to encourage greater involvement of adults in the teaching/learning process. To encourage higher-order cognitive learning, teaching should be planned for and delivered at those levels as suggested by Anderson et al. (1985), Perkins & Salomon (1989), Thomas & Englund (1990), Bhardwaj (1989), and Whittington (1991).

References Cited

- Anderson, R. C., Hiebert, E. H., Scott, J. A. & Wilkenson, I. A. G. (1984) *Becoming a nation of readers: The Report of the Commission on Reading*. Urbana, IL: University of Illinois.
- Bhardwaj, A. (1989) *Cognitive levels of the educational programs offered by the Ohio cooperative extension service county agricultural extension*.