

Factors Associated with Internationalization of Secondary Level Agricultural Education Programs

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Global education has been defined as a process that provides students and individuals with the knowledge, skills, and attitudes necessary for them to meet their responsibilities as citizens of their community, state, and nation in an increasingly interdependent and complex global society (Florida Task Force, 1982). The development of agricultural industry in any country is inextricably linked to changes in global economy and educational advancement. The mission of agricultural education in the United States is to foster the development of knowledge and skills related to the industry of agriculture (National Task Force, 1987). To compete effectively in the ever changing, complex international labor force, agriculturally educated individuals must understand the global nature of agricultural industry and its effects on United States domestic food production, distribution, and consumption. In 1988, the National Research Council recommended that the dominance of local production agriculture in the curriculum must be broadened to include global concepts on utilization of agricultural commodities, distribution, and management. The implementation of this recommendation requires a major change in the agricultural curriculum. This curriculum change will require teachers who are committed to internationalizing their agricultural programs.

One major challenge to agricultural educators in the next decade will be how to address the issue of the growing complexity in global interdependence (McCracken, 1990). The Commission on Global Education (1987) reported that schools were not responding fully to the need to educate students for citizenship, nor were they recognizing the global demands which would be expected of U. S. citizens in the future. According to Hemp (1980), the practice of basing agriculture courses of study entirely on local farm practice and preparing students for employment in the local community was no longer a defensible approach to the development of agricultural education programs in secondary schools. White (1990) noted that internationalizing agricultural education sparked

students' interests, revitalized agricultural education programs, and most importantly, provided students with a more complete picture of agricultural education.

The assumption that internationalization is an educational innovation necessitated an examination of change process literature to provide theoretical strength to the study. Plomp and Carleer (1986) conceptualized three sets of variables influencing implementation of educational innovations. The first set of variables is foundational. This set includes school and state support, favorable teacher attitude, and sufficient teacher experience. The second set of variables of special importance at the beginning of the innovation include teachers' knowledge of the topic, contact with other teachers, inservice training, and material resources. Teacher participation and initiative deliberation structure, and planning constitute the third variable set, which is very relevant for the continuation of the implementation process.

Fullan (1982) indicated that active administrative commitment and leadership at the school level, quality and frequency of collegial interaction among educators, and the availability of validated resource materials are necessary for successful implementation of an educational innovation. Fullan concluded that the more teachers experience the rewards of interaction, the more they will use the criterion of professional contact and development as a means to become more involved in educational innovation.

Educators who were involved in international programs tended to have a more positive attitude about international educational programs (Reaman & Etling, 1990), and were more likely to integrate international concepts into their curricula than those without such experience (Pause & Swanson, 1980); and Reisch, 1989). Reisch further stated that the key elements related to internationalization of the agricultural curriculum

in primary and secondary schools were the teachers knowledge of international aspects and an awareness of global interdependence and cultures of other people. Pierce (1981) reported that young teachers with higher levels of formal education are more likely to implement educational innovation.

Davis (1989) reported that teachers were interested in infusing international agricultural concepts into their curriculum but were at loss about what to teach. Teachers lacked the knowledge base to make such instruction relevant. Successful implementation of international agriculture would require both affective and behavioral changes in the individual teachers involved in the integration of global perspectives. Educators (Kellogg, 1984) have the responsibility to teach agricultural materials from the perspective that explicitly takes into account the international and foreign dimensions of agriculture.

Agricultural teachers have demonstrated favorable attitudes toward international agricultural programs (Hossain & Moore, 1992). However, high school students continue to have a limited awareness of international concepts (McCracken, 1990; Harbstreit & Welton, 1992). Little is known about the extent of integration of international agricultural concepts and the factors influencing the integration efforts.

Purpose and Objectives

The major purpose of the study was to investigate the extent to which international agricultural dimensions were taught in secondary agricultural programs and determine the factors associated with the extent of integration. Specific objectives were to determine:

The extent of internationalization of agricultural programs.

The relationship between the extent of integration of international agricultural concepts and selected demographic variables: teacher age, teacher tenure, teacher level of education, and school location.

The relationship between the extent of integration of international agricultural concepts and international experience variables: knowledge of international

agriculture, attendance at an inservice workshop on international agriculture, teacher international travel and teacher cultural awareness.

The relationship between the extent of integration of international agricultural concepts and work-related variables: commitments by the state, school, and teachers; attitude of the teachers towards international agriculture; sources of information; and resources utilized.

Procedures

The population was the secondary school agricultural teachers in the 12 states of the North Central Region: Illinois, Iowa, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin, who were listed in the Agricultural Educators Directory (Henry, 1992) (N=2,612). A systematic sampling method was utilized to draw a representative sample of 332 agricultural teachers from the directory (Krejcie and Morgan, 1970). Every eighth name from the list was drawn with a random start. The systematic sampling technique enhanced the control of sampling error. Fowler (1988) indicated that systematic sampling yields a precision equivalent to a simple random sample, but possesses the benefits of stratified random sampling. There was a 95 percent probability of sampling error of less than plus or minus 5 percent from population parameters.

A descriptive research design with a correlational component was utilized. Descriptive statistics consisting of frequencies, means, percentages and standard deviations were calculated for all the variables. Pearsons product moment correlation coefficients and Kendall's Tau were used to estimate the relationships between variables. Regression analysis was performed to determine the proportion of variance in the dependent variable "extent of integration" that was explained by a linear combination of relevant independent variables.

The questionnaire was divided into four parts. Part One of the instrument measured the dependent variable: extent to which international agricultural concepts were taught in secondary agricultural classes. Part Two consisted of these independent variables: knowledge of international

agriculture, participation in internationalization workshops, international travel and cultural awareness. Part Three assessed teachers' work-related characteristics: attitude towards international agriculture, institutional commitment, sources of information and the instructional material utilized. Part Four collected demographic information. Likert-type summated scales were developed to measure the extent of integration, cultural awareness, attitude toward international agriculture, and institutional commitments. Knowledge was measured by a series of true or false cognitive statements drawn from various international agricultural dimensions. Content validity was established by a panel of experts consisting of graduate students and faculty members. Cronbach's alpha was used as a measure of internal consistency for sections of scaled items yielding reliability coefficients ranging from .63 to .94. Instruments were pilot-tested with a group of Ohio teachers that were not a part of the sample for the study.

Data were collected in Spring of 1992. Procedures included an initial and follow-up mailing, postcard reminder, and telephone interviews of a 15 percent random sample of nonrespondents, yielding a 70 percent (n=231) overall response rate. Only 66 percent of the responses were usable. Comparisons were made between respondents and nonrespondents, and between early and late respondents. There were no statistically significant differences between either of the groups.

Findings

Extent of Integration

Nine different international agricultural dimensions suggested by McCracken & Magisos (1989), and the National Task Force (1987), were used to measure the extent of integration of international concepts. Overall, 58 percent of the teachers reported that they taught international agricultural concepts in their classes. Table 1 shows the rank order and mean scores reflecting the extent to which the various international agricultural dimensions were taught in agricultural classes. The five most integrated international dimensions in secondary agricultural classes were the origin of crops, agricultural technology, agricultural trade, and geographics, economic and political factors. Agricultural practice was the least

taught international dimension. The overall mean score on the extent of integration was 2.74, on a five-point scale and the standard deviation was .67. Of all the twelve states sampled in the study, Ohio ranked first on the extent of integration with a mean score of 2.91, followed by Wisconsin at 2.90. Minnesota ranked 12th with mean score of 2.34. Ohio, Wisconsin, Missouri, Illinois, Indiana, and Kansas scored above the overall mean of 2.74, while Michigan, South Dakota, North Dakota, Iowa, Nebraska, and Minnesota scored below the overall mean.

Table 1. Rank Order and Mean Scores Reflecting the Extent of Integration of International Agricultural Dimensions (n=220)

International agricultural dimensions	Rank	Mean	SD
Origin of crops	1	3.2	1.1
Agricultural technology	2	2.9	1.0
Agricultural trade	3	2.9	1.1
Geographical factors	4	2.9	1.2
Economic factors	5	2.8	1.0
Political factors	6	2.8	1.1
Consumption of food and fibre	7	2.7	1.0
Cultural factors	8	2.4	0.9
Agricultural practice	9	2.2	0.9

Measured on a five-point scale: 1=never, 2=rarely, 3=sometimes, 4=frequently, 5=always.

Overall Mean=2.74

Standard Deviation=.67

Exploration of Relationships Between Variables

Low positive relationships, significant at the .05 level, were found between extent of integration and the number of years teachers taught agriculture ($r=.15$), age of teacher ($r=.11$), and level of formal education ($r=.17$). Teachers' school location (urban or rural) was unrelated with the extent of integration of international concepts. Positive relationships were also found between the extent of integration and international experience variables: cultural awareness ($r=.23$) and teacher knowledge of food and fibre consumed in other countries ($r=.12$). Participation in internationalization workshops and international travel were not related to the extent of integration.

Significant but low positive relationships were found between the extent of integration of international concepts and work-related variables:

the attitude of teachers ($r=.27$), teacher commitment ($r=.14$), perceived state department of education commitment ($r=.11$), and perceived school commitment ($r=.29$). Teachers with greater extent of integration of international concepts tended to use the following sources of information: Cooperative Extension Service ($\text{Tau}=.15$), mass media ($\text{Tau}=.24$), text and reference books ($\text{Tau}=.17$), curriculum material services ($\text{Tau}=.23$), and personal contact with other teachers ($\text{Tau}=.24$). The teachers utilized the following instructional resource materials on international agriculture in teaching their agriculture classes: basic curriculum guides on international dimensions ($\text{Tau}=.25$), student activities on global perspectives ($\text{Tau}=.16$), resource people ($\text{Tau}=.32$) and visual materials (films, video tapes) on international agriculture ($\text{Tau}=.34$).

Regression Analysis

A semi-partial multiple regression analysis was calculated to determine the amount of variance explained in the extent of integration score by the three sets of independent variables. The three demographic variables, two international experience variables, and the 13 work-related variables that were significantly related to the extent of integration comprised the variable sets. The demographic and work-related variable sets explained a unique portion of variance in the dependent variable (Table 2). The total R^2 was .40.

Table 2. Semi-Partial Multiple Regression Coefficients for the Independent Variable Sets

Variable sets	K_A	K_B	sR^2	F
Demographic variables	15	3	.024	2.67*
International experience	16	2	.014	2.35
Work-related variables	5	13	.279	7.12**

$R^2=.40$, * $p<.05$, ** $p<.001$, (df 18, 199), K_A =# of variables controlled. K_B = # of variables in the set.

A stepwise multiple regression was performed to determine the variables that could best predict the extent of integration of international concepts (Table 3). The following five independent variables were found to be the best

predictors of the integration of international concepts: attitude toward international agriculture, level of formal education, utilization of visual materials on international agriculture, basic international agriculture curriculum guide as the most utilized instructional resource materials, and mass media as a highly important information source for international agriculture. The five variables explained 35.3 percent of the variance in extent of integration of international concepts.

Discussion

The extent of integration of international agricultural concepts in the secondary schools is less than desired. In addition to the quantitative data, many teachers provided comments, both positive and negative, about internationalizing the curriculum. Some teachers felt that a better job of preparing students with nonagricultural backgrounds for agricultural jobs should have a priority over internationalizing the curriculum. Others felt that the current curriculum was already too packed with material to add something additional. The nature of favorable comments was that internationalizing the curriculum would assist in expanding the base of interested students, in assisting future agriculturists in expanding agricultural exports, and in preparing students for global careers.

Findings of this research were generally consistent with previous research on the adoption of educational innovations. There was one notable exception. Older teachers were more likely to adopt the internationalization of their curricula than were younger teachers. Even though the correlation was low, the direction of the relationship was different than anticipated. It may be that awareness of and interest in global agriculture increases with age to the extent that the older and more experienced teachers are more apt to work this new emphasis area into their curricula.

Teachers perceiving strong school administration support for internationalizing the curriculum were more likely to adopt this curriculum change. It appears that school administrators have a strong influence on the curriculum and can influence innovation with necessary leadership activities. Such leadership activities might include organization of inservice education on international agriculture, provision of instructional materials, and suggestions for

Table 3. Stepwise Multiple Regression Scores on Significant Independent Variables

Independent variables	Multiple R	R ²	R ²	
			change	F
Visual materials X ₁	.465	.217	.217	28.68**
Attitude X ₂	.514	.265	.048	11.07**
Basic curriculum guide X ₃	.559	.304	.040	12.94**
Mass media X ₄	.579	.335	.031	10.37**
Level of education X ₅	.594	.353	.018	5.95*

*p<.05, **p<.001. The calculated regression coefficients (B's) and the intercepts (A) were: $Y = .32x_1 + .19x_2 + .21x_3 + .18x_4 + .14x_5 + .453$.

changes in curriculum priorities.

Teachers attitudes towards the integration of international concepts may predispose the extent to which they integrate international agricultural dimensions in their classes. It appears that agricultural teachers who exhibit higher degrees of cultural awareness would be more likely to internationalize their agricultural instruction. Conversely, teachers who lack awareness of other cultures may not be interested or may even resist internationalizing their agricultural instruction.

Based upon the findings of this research, the following variables appear to be the most significant factors contributing to the extent of integration of international concepts: utilizing visual materials (slides, video tapes) on international agriculture, attitude towards integrating international concepts, utilizing basic international agriculture curriculum guides, mass media as an important source of information, and level of formal education.

Further research is recommended to develop and test curriculum materials, prioritize the possible curriculum content, establish justification of need for a global dimension in agricultural occupations, and determine the interest and knowledge of agricultural students about international concepts.

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