# Assessing the Learning Styles of Iowa Farmers

Larry D. Trede
Kevin S. Miller
Iowa State University

## Abstract

Learning styles have been studied for many years; however, studies focusing on learning styles of farmers are very limited. Knowledge of learning styles is important and may be useful in the development and conduct of adult education programs.

The purpose of this study was to establish baseline information regarding the distribution of learning styles among Iowa farmers. A secondary purpose was to establish for these same individuals their stated preferred learning mode for selected agricultural topics.

A purposive sample (judgment sampling) was developed with assistance from the Iowa Farm Bureau Federation. A self-administered mail survey was distributed to 1100 members on county leadership committees. Three hundred and sixty four (33.1%) were returned and 289 (26.3%) were useable. Content validity was ensured by a panel of experts. A reliability analysis was completed on the useable responses for sections B and C of the survey instrument with the result of a Cronbach Alpha of .84 for each section.

The learning style for each respondent was determined using the Kolb Learning Style Inventory (LSI). The Kolb LSI consists of 12 open-ended statements with four choices available to complete the statement. Each choice corresponds to one of four learning modes which are combined to determine an individual's learning style.

The preferred learning style for the respondents was the Assimilator (49.1%). Other learning styles were: Accommodator (14.6%), Diverger (14.9%), and Converger (21.4%). Individuals with the Assimilator learning style prefer to grasp knowledge through abstract conceptualization (logic and analysis) and transform it by reflective observation (learning by watching others).

The results of the study showed that active experimentation (learning by doing) seemed to be the preferred learning mode for agricultural topics related to physical farming resources (land, crops, livestock, machinery, and buildings) while abstract learning by observing others) were the preferred learning modes for more critical thinking activities such as markets and prices, whole farm planning, and financial management.

The farmers were also asked to rate the effectiveness of 26 different learning activities. Rating high were the use of consultants or specialists, attending field days, tours, and demonstrations, attending a single or series of meetings on a specific topic, and studying and analyzing a problem on my own. The farmers rated university and community college credit classes, watching a television program, audio tapes, and reading a newspaper much lower in terms of their effectiveness.

Although the results of this study may not be generalized to the entire population of Iowa farmers, the results can still provide valuable information to educational providers as they plan and deliver education to Iowa farmers.

## Introduction/Theoretical Framework

Learning styles have been studied for many years by researchers; however, studies focusing on the learning styles of farmers are very limited. For many agricultural adult education programs, the content is planned, developed, and delivered without regard to the learning style of the farmer (adult learner). Increasing the awareness of differences in learning styles of farmers by adult education providers, (extension services, community colleges, and commercial entities, and others) can enhance learning.

Apps states, "Life-long learning goes well beyond the workplace...Lifelong learning also includes consideration of global issues such as social, economic, and environmental problems" (Apps, 1991, p.2). Since information is doubling every four to five years, educational providers, according to Apps (1991), need to help adult learners make sense out of what information they currently have available before providing them more.

Today's farming environment is highly competitive and typically provides narrow profit margins. Production technology has become very technical with the advent of biotechnology, global positioning, computers, and satellite communications. To make competent management decisions, farmers must be able to acquire, interpret, and evaluate trusted and credible knowledge in an efficient, effective, and convenient manner (USDA, Commission of Small Farms, 1998).

Knowledge of learning styles is important to educational providers. According to Kolb (1984), learning is conceived as a holistic adaptive process, providing conceptual bridges across life's situations. Drawing upon the experiential learning work of Dewey (1938), the active learning work of Lewin (1951), and Piaget (1952) who described intelligence as primarily the result of interaction between a person and the environment, Kolb described learning as a four step life-long continuous process. As adult learners, people become more skilled in grasping and transferring experiences and rely more on a particular style of learning.

Past research has demonstrated that learning style preferences by students and the consideration that teachers give to those learning styles has been closely related to student learner achievement, dropout rates, and student satisfaction (Rollins & Scanlon, 1991; Rollins, 1990; Cox, Sproles & Sproles, 1988; Price, 1983). While this research has not involved adults, the usefulness of learning styles in postsecondary and nonformal adult education has been demonstrated (Smith, 1982). Pigg, Busch, and Lacy (1980) concluded that using a learning style inventory may be useful in the development and conduct of adult education programs.

Claxton and Murrell (1987) concluded that information about learning style can help the teacher to become more sensitive to differences students bring to the classroom. Also, depending upon a teacher's purpose, understanding learning styles can serve as a guide in designing learning experiences to match the learning style.

Kolb's (1984) experiential learning theory was used as a basis for the learning styles assessed in this study. Kolb described learning as a cycle consisting of four modes: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). The order in which the modes occur within the cycle and the importance of each mode depends upon the individual's learning style.

Kolb then further describes four specific learning styles by combining the AC-CE and AE-RO scores from a 12-question Learning Style Inventory. The four learning styles identified by Kolb are: accommodator, diverger, converger, and assimilator. Assimilators, as defined by

Kolb, are persons who benefit little from unstructured "discovery" learning such as exercises and simulations. They tend to be more interested in abstract ideas and concepts and are best at inductive reasoning and theory construction. They rely most heavily on abstract conceptualization(AC) and reflective observation(RO). Convergers tend to focus on solving problems and making decisions based on finding solutions to questions. They like to follow abstract conceptualization(AC) with active experimentation(AE). According to Kolb, divergers tend to approach a situation by observing rather than taking action while accomodators are persons who learn primarily from "hands-on" experience. Divergers combine concrete experience(CE) with reflective observation(RO) to learn. Accomodators tend to act on instinct rather than logic and rely heavily on people for information rather than their own technical analysis. Their learning style relies greatly upon concrete experience(CE) and active experimentation(AE). Accomodators prefer "hands-on" experience and often rely more on "feelings" rather than "logical analysis" when solving problems.

## Purpose/Objectives

The purpose of this study was to establish baseline information regarding the distribution of learning styles among Iowa farmers. A secondary purpose was to establish for these same individuals their stated preferred learning mode for selected agricultural topics regarded as important to today's farming industry. The specific objectives of the study were:

1. To determine the learning style of the Iowa farmers participating in this study using the Kolb Learning Style Inventory and to examine the distribution of these styles among the respondents.
2. To determine the preferred learning mode of the respondents for selected agricultural topics.
3. To determine the perceived effectiveness of selected learning activities and the impact of learning style on those learning activities.

This study is part of a five-year agriculture experiment station project focusing on the educational delivery of programs for farmers, particularly beginning farmers. Previous studies have focused on the educational needs of beginning farmers as perceived by themselves and by selected educational providers.

## Methods/Procedures

The logistics of achieving a true random sample of the entire population of Iowa farmers was infeasible within the time and financial constraints of this study. As an alternatives to a random sample, a purposive sample was developed. Ary (1996) states that in purposive sampling (also known as judgement sampling) sample elements judged to be typical or representative are chosen from the population.

The Iowa Farm Bureau Federation provided assistance in identifying and distributing the survey instrument to its members on county leadership committees found in all Iowa counties. Respondents' anonymity was guaranteed by the researchers to the Iowa Farm Bureau Federation,

and, therefore, the researchers did not have access to the mailing list. Because of this process, a direct follow-up with non-respondents was not possible. A follow-up was done by sending all recipients a reminder request to complete the survey. Also, the anonymity requirement prevented comparing non-respondents to respondents.

The survey was a self-administered mail survey. A total of 1100 surveys were mailed in February, 1999. The reminder was mailed approximately one month following the initial mailing. Three hundred and six-four (33.1%) were returned and 289 (26.3%) were useable.

The survey instrument was reviewed by a panel of experts including agricultural education faculty and graduate students, Iowa Farm Bureau Federation staff, other adult educators, and farmers. The farmers reviewing the study were not included in the sample.

The survey instrument was divided into four sections. Section 1 collected demographic data and characteristics of the respondents. Bracketed data rather than specific individual data were collected to retain anonymity and increase response rate. Section 2 was designed to measure the attitude of the respondents on 26 different statements regarding their education. A 5-point Likert-type scale was utilized. Section 3 of the survey was designed to determine the preferred learning mode of the respondents for nine different agricultural topics. The final section of the survey determined the learning style of the respondents based upon the Kolb Learning Style Inventory.

In purposive sampling, a crucial question is arriving at a typical sample, according to Ary (1996). Since a random sample was not possible, demographic data were collected from the respondents and compared to the Census of Agriculture, Iowa -- 1997. Demographic data from these 289 respondents on farm size (acres), farm sales, and age were compared to census data. The comparisons revealed that the respondents were generally similar to the census data (Miller, K and L. Trede, 2000). Additionally, the useable surveys were returned from all crop reporting districts in Iowa with at least 20 respondents from each district except for one.

Each respondent was asked to complete the Kolb Learning Style Inventory (LSI). The Kolb LSI has a well-developed theoretical foundation (Park and Gamon, 1996). It is considered to be the most widely used learning style inventory (Carricato, 1983) and McCall, 1984). It consists of 12 open-ended statements with four choices available to complete the statement. The respondent ranks the ending for each sentence on how well it fits with how he/she would go about learning something. One word in each item corresponds to one of the four learning modes. The LSI measures a person's relative emphasis on each of the four modes. Responses are summed to determine the "learning mode" which, in turn, are summed to a two-number combination to determine the learning style. As reported by Rollins and Yoder (1993), the reliability estimates (Cronbach's alpha) for the four basic learning modes and the two combination scores of the LSI range from .73 to .88.

## Results/Findings

Table 1 shows the learning styles of the respondents. Two hundred eighty-one respondents (97.23%) completed the LSI. For those respondents, the distribution of learning styles was as follows: accommodator (41; 14.6%), diverger (42; 14.9%), converger (60; 21.4%), and assimilator (138; 49.1%). The learning style for eight respondents could not be determined because of incomplete responses.

As noted earlier, Kolb stressed that learning consists of a cycle that includes four learning modes and the order in which they occur and the importance of each depends upon the individual's learning style. The four learning modes, as described by Kolb, are: concrete experience (CE, trusting feelings and hunches); reflective observation (RO, listening and watching), abstract conceptualization (AC, using reasoning and logic); and active experimentation (AE, learning by doing). Section C of the survey was designed to determine if the farmers perceived a preference in a learning mode for nine different agricultural topics. Respondents were asked to indicate how they would "best like to learn" about each of these topics. The nine agricultural topics were: crop production practices, technology, and management; livestock production practices, technology, and management; farm markets, marketing strategies, pricing; financial management, records and analysis; machinery and equipment maintenance and repairs; building and facilities maintenance and repairs; whole farm planning and long-term decision-making; resource conservation and sustainability; and technology transfer including computers, GPS, etc. Table 2 shows the distribution of the respondents for each program topic and preferred learning mode.

Table 1.
Kolb Learning Style for the respondents

| Learning Style | n | Pct. of Total |
|---|---|---|
| Accommodator (AC) | 41 | 14.6% |
| Diverger (DI) | 42 | 14.9% |
| Converger (CO) | 60 | 21.4% |
| Assimilator (AS) | 138 | 49.1% |
| No Response | 8 | |

Nearly half of the respondents preferred active experimentation (learning by doing) for machinery and equipment maintenance and management and building and facilities maintenance and management (49.6% and 47.3%, respectively). Rating high for active experimentation were crop and livestock production practices and management. Both were above 40% of the total respondents. This indicates a strong preference for learning by doing and experimenting on their own for these agriculture program areas. Rating the lowest as a learning mode for these four topics was concrete experience (learning by intuition and feelings).

The farmers tended to prefer learning about whole farm planning and long-term decision making through abstract conceptualization (using critical thinking skills and logic) rather than active experimentation or concrete experience. Slightly more than 40% of the respondents preferred this mode for whole farm planning.

The farmers were more equally divided among the four learning modes for financial management and markets and prices. For financial management 36% of the respondents preferred active experimentation while 29.8% preferred abstract conceptualization; however, less than 15% preferred concrete experience. The differences were less pronounced for markets and prices with farmers about equally divided among the four learning modes. The most preferred

mode for markets and prices was reflective observation (28.5%) and the least preferred mode was concrete experience (20.1%).

Table 2.
Preferred learning mode of the respondents for selected agricultural topics*

| | CE | RO | AC | AE |
|---|---|---|---|---|
| | n | n | n | n |
| Agricultural topic | % | % | % | % |
| Crop production mgt. | 29 | 61 | 50 | 97 |
| | 12.2 | 25.7 | 21.1 | 40.9 |
| Livestock production mgt. | 32 | 56 | 41 | 80 |
| | 15.3 | 26.8 | 19.6 | 38.3 |
| Markets and prices | 48 | 68 | 65 | 58 |
| | 20.1 | 28.5 | 27.2 | 24.3 |
| Financial management | 35 | 46 | 71 | 86 |
| | 14.7 | 19.3 | 29.8 | 36.1 |
| Machinery & eqt. mgt. | 38 | 42 | 39 | 117 |
| | 16.1 | 19.3 | 29.8 | 49.6 |
| Buildings & facilities mgt. | 34 | 49 | 43 | 113 |
| | 14.2 | 20.5 | 18.0 | 47.3 |
| Whole farm planning | 42 | 38 | 96 | 63 |
| | 17.6 | 15.9 | 40.2 | 26.4 |
| Resource conservation | 42 | 74 | 65 | 58 |
| | 15.8 | 31.6 | 27.8 | 24.8 |
| Technology transfer | 30 | 81 | 44 | 71 |
| | 13.3 | 35.8 | 19.5 | 31.4 |

*Note: CE = concrete experience; RO = reflective observation; AC = abstract conceptualization; AE = active experimentation. n=number reporting; %=pct. of total reporting.

Regarding issues related to resource conservation and sustainability, reflective observation (learning by observing) rated the highest (31%) followed by abstract conceptualization (28%). This would indicate a desire to observe others or using thinking/logic to solve resource conservation and sustainability problems.

The farmers tended to prefer to learn about technology transfer by watching and listening and observing others (reflective observation) rather than the other learning modes. Thirty-five percent indicated reflective observation as their preferred learning mode. Ranking second in this category was active experimentation (31.4%). Least preferred was concrete experience.

Respondents were also asked to rate the effectiveness of 26 different learning activities using a 5-point Likert-type scale. These results are shown in Table 3. Talking with a consultant/specialist and attending field days, tours, and demonstrations were the two highest rated items with means scores above 4.0. Rated together (mean=3.97) were attending either single meetings or an in-depth series of meetings on a special topic and studying and analyzing a

problem on my own. Those learning activities that rated lower among the farmers were listening to audio tapes, reading the newspaper, watching television programs, participating in either credit or non-credit classes at a local high school, community college, or university. All of these activities had mean scores of 3.38 or less. Being the first in my neighborhood to try something new rated the lowest.

The ratings for the 26 different learning activities were grouped by the four Kolb learning styles for the farmers participating in the study. The means and standard deviations for the top half based upon the overall ratings are shown in Table 4. The learning activities were assigned by the researchers to one or more of the four Kolb learning modes. These designations are also shown in Table 4.

Assimilators, as a learning style, prefer to acquire knowledge by abstract conceptualization (AC) and then transform the knowledge by reflective observation (RO). This group rated "attending field days, etc. (RO)", "reading and studying popular farm publications (AC)", and attending a single meeting (CE/RO)" fairly high as effective learning activities and all three are somewhat consistent with the Assimilator learning style.

Convergers, as a learning style, generally acquire knowledge by abstract conceptualization (AC) and then transform that knowledge by active experimentation (AE). "Studying and analyzing a problem on my own (AC)" and "experimenting on my own (AE)" were two learning activities that were highly rated by this group and both are consistent with the Converger learning style. This group, however, showed a preference towards "attending field days, etc. (RO)" and "attending a series of in-depth meetings (CE/RO)." Both of these learning activities are more consistent with other learning styles.

Acquiring knowledge by concrete experience (CE) and transforming it by reflective observation (RO) are the preferred learning modes of Divergers. Rating high as learning activities for this group were: "talking with a consultant or specialist (CE)", "attending a single meeting (CE/RO)", "talking with family, friends, neighbors (CE)", "attending field days, etc.(RO)", and "attending seminar/class sponsored by Extension (CE/RO)." All of these activities are consistent with the Diverger learning style.

Table 3.
Means and standard devations for the effectiveness of various learning activities*

| Learning activity | Mean | Std. Dev. |
|---|---|---|
| Talking with a consultant or specialist | 4.05 | 0.76 |
| Attending field days, tours, demonstrations | 4.02 | 0.78 |
| Attending a single meeting on a specific topic | 3.97 | 0.74 |
| Attending a series of in-depth meetings on a specific topic | 3.97 | 0.94 |
| Studying and analyzing a problem on my own | 3.97 | 0.80 |
| Participating in an educational activity that enhances lifelong learning | 3.93 | 0.86 |
| Experimenting on my own | 3.90 | 0.86 |
| Attending a seminar/class sponsored by the Extension Service | 3.85 | 0.86 |
| Watching others and learning from them | 3.85 | 0.82 |
| Trying out new technologies/practices on my own | 3.81 | 0.87 |
| Attending a seminar/class sponsored by an agribusiness firm | 3.80 | 0.72 |
| Talking with family, friends, neighbors | 3.79 | 0.80 |
| Reading and studying popular farm publications | 3.75 | 0.78 |
| Doing my own research on something new or different | 3.59 | 0.89 |
| Reading and studying trade publications and technical journals | 3.58 | 0.82 |
| Using a consulting or marketing service | 3.48 | 0.92 |
| Attending a meeting over the ICN | 3.40 | 0.89 |
| Listening to radio broadcasts on specific topic | 3.38 | 0.87 |
| Watching a video tape | 3.36 | 0.81 |
| Attending class sponsored by local high school | 3.31 | 0.82 |
| Participating in community college credit class | 3.27 | 0.89 |
| Participating in credit class at university | 3.26 | 0.92 |
| Watching a television program | 3.09 | 0.91 |
| Listening to an audio tape on specific topic | 3.09 | 0.93 |
| Reading the newspaper | 3.04 | 0.99 |
| Being the first in my neighborhood to try something new | 3.00 | 0.99 |

*Note: 5-point Likert scale. 1=very ineffective, 2=ineffective, 3=no opinion, 4=effective, 5=very effective.

Table 4.
Means and standard deviations for the effectives of various learning activities by learning style learning style.

| | Accomodator | | Assimilator | |
|---|---|---|---|---|
| Learning activity | Rank* | M/SD** | Rank* | M/SD** |
| Talking with a consultant or specialist (CE) | 1 | 4.03/0.77 | 2 | 4.01/0.72 |
| Attending field days, tours, demonstrations (RO) | 2 | 4.02/0.82 | 1 | 4.03/0.79 |
| Attending a single meeting on a specific topic (CE/RO) | 5 | 3.94/0.78 | 3 | 3.93/0.74 |
| Attending a series of in-depth meetings on a specific topic (CE/R0) | 6 | 3.93/0.96 | 6 | 3.90/0.98 |
| Studying and analyzing a problem on my own (AC) | 3 | 3.97/0.86 | 6 | 3.90/0.70 |
| Participating in an activity that enhances lifelong learning | 3 | 3.97/0.83 | 5 | 3.92/0.95 |
| Experimenting on my own (AE) | 9 | 3.89/0.90 | 10 | 3.79/0.84 |
| Attending a seminar/class sponsored by the Extension (CE/RO) | 10 | 3.88/0.94 | 13 | 3.67/0.92 |
| Watching others and learning from them (RO) | 7 | 3.92/0.77 | 8 | 3.86/0.94 |
| Trying out new technologies/practices on my own (AE) | 8 | 3.91/0.81 | 12 | 3.68/0.85 |
| Attending a seminar/class sponsored by agribusiness (CE/RO) | 11 | 3.77/0.78 | 9 | 3.83/0.65 |
| Talking with family, friends, neighbors (CE) | 12 | 3.76/0.84 | 11 | 3.75/0.83 |
| Reading and studying popular farm publications (AC) | 13 | 3.69/0.84 | 3 | 3.93/0.56 |

| | Converger | | Diverger | |
|---|---|---|---|---|
| Learning activity | Rank* | M/SD** | Rank* | M/SD** |
| Talking with a consultant or specialist (CE) | 6 | 4.08/0.72 | 1 | 4.21/0.69 |
| Attending field days, tours, demonstrations (RO) | 3 | 4.10/0.61 | 5 | 3.82/0.83 |
| Attending a single meeting on a specific topic (CE/RO) | 6 | 4.08/0.67 | 2 | 3.97/0.80 |
| Attending a series of in-depth meetings on a specific topic (CE/RO) | 1 | 4.28/0.78 | 5 | 3.82/0.97 |
| Studying and analyzing a problem on my own (AC) | 2 | 4.18/0.80 | 4 | 3.85/0.74 |
| Participating in an activity that enhances lifelong learning | 3 | 4.10/0.79 | 10 | 3.71/0.84 |
| Experimenting on my own (AE) | 3 | 4.10/0.84 | 5 | 3.82/0.77 |
| Attending a seminar/class sponsored by the Extension (CE/RO) | 8 | 4.06/0.62 | 5 | 3.82/0.76 |
| Watching others and learning from them (RO) | 12 | 3.78/0.65 | 9 | 3.76/0.89 |
| Trying out new technologies/practices on my own (AE) | 10 | 3.88/0.96 | 13 | 3.59/1.02 |
| Attending a seminar/class sponsored by agribusiness (CE/RO) | 9 | 3.92/0.60 | 10 | 3.71/0.87 |
| Talking with family, friends, neighbors (CE) | 11 | 3.86/0.45 | 3 | 3.88/0.84 |
| Reading and studying popular farm publications (AC) | 13 | 3.70/0.84 | 12 | 3.68/0.84 |

Note: * rank order of ratings assigned by researchers based upon the ratings of respondents
** M=means; SD=standard deviations
the letter designations following each learning activity pertains to one or more of Kolb's learning modes.

## Conclusions/Recommendations/Implications

The major purpose of this study was to establish some baseline information regarding the learning style of Iowa farmers and their preferred learning mode for selected agricultural program topics.

The preferred learning style for the respondents was the Assimilator style with nearly half of the respondents preferring this style. Individuals with this learning style prefer to grasp knowledge through abstract conceptualization (using logic and analyzing information) and then transform it by reflective observation (learning by watching others). They tend to learn best by inductive reasoning and testing theories and ideas. This implies that educational providers in agriculture should plan and implement programs that emphasize logic, ideas, concepts, and

problem-solving rather than just "learning by doing." For example, educational meetings for farmers that include presentations emphasizing the theory and application followed by panel discussions, case studies, and other methods which allow participants to conceptualize, reflect, and adapt the presented information to their individual situation would be most effective.

Slightly more than 70% of the respondents in this study preferred the Assimilator or Converger learning styles. Both of these learning styles are associated with abstract conceptualization for acquiring information. Learning is then transformed by reflective observation (Assimilator) or active experimentation (Converger). For educational providers, this implies that activities such as field days, tours, demonstrations, providing information via farm publications, providing consulting services, and sponsoring educational meetings are all consistent with these two learning styles. These learning activities were rated higher in terms of effectiveness as compared to credit classes, audio tapes, and watching a television program which are also consistent with these two learning styles.

An interesting aspect of this study was the preferred learning mode of the respondents for selected agricultural program topics. Active experimentation seemed to be the preferred learning mode for agricultural topics related to physical farming resources (land, crops, livestock, machinery, buildings) while abstract conceptualization or reflective observation were preferred for more critical thinking activities such as markets and prices, whole farm planning, and financial management.

Farmers were asked to rate the effectiveness of 26 different learning activities. Rating high among all respondents were the use of consultants or specialists, attending field days, tours, and demonstrations, attending a single or series of meetings on a specific topic, and studying and analyzing a problem on my own. These farmers rated university and community college credit classes, watching a television program, audio tapes, and reading a newspaper much lower in terms of their effectiveness.

Educational providers should consider not only the preferred learning activities but other activities that enhance learning. Additionally, program planners should not plan activities based solely upon popularity. Learning activities are likely to be most effective when the perceived preferred learning mode is combined with a variety of other activities associated with other learning modes. For example, "hands-on" learning for information on new agricultural technology could be combined with "critical thinking" to make an effective program.

While the results of this study may not be generalized to the entire population of Iowa farmers, these results can still provide valuable information to educational providers as they plan and deliver education to Iowa farmers. Additional studies should be conducted with other farming groups to verify these results. Educational providers need further understanding of farmers' learning styles and the topical effect in order to conduct meaningful educational programs for farmers.

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## Assessing the Learning Styles of Iowa Farmers

## A Critique

Steven R. Harbstreit
Kansas State University

The authors provide a sound basis for the need for this study supported by the development of an excellent theoretical framework. The purpose and objectives are well defined and appropriate. The study utilized a self-administered mail survey to determine the learning styles of Iowa farmers, the preferred learning mode for selected agricultural topics, and the perceived effectiveness of selected learning activities and the impact of learning style on those learning activities.

The authors utilize appropriate methods and procedures for this study. Since a random sample was not practical to obtain, purposive sampling techniques were utilized. Statistical analysis procedures were consistent with the purpose and objectives of the study.

One concern for this reader is the low response rate. Respondents' anonymity were guaranteed by the researchers to the Iowa Farm Bureau Federation. Would it have been possible for the surveys to have been numbered or coded in some way that could have provided a mechanism for at least some followup? The information gained is excellent, however, it would have been nice to be able to generalize to a larger population.

The authors make several recommendations/conclusions in this study. They indicate that educational meetings for farmers that include theory and application followed by a panel discussions, case studies, and other methods which allow participants to conceptualize, reflect, and adapt the presented information would be most effective. Since 70 % of the respondents preferred the Assimilator or Converger learning style, educational programs that include traditional activities such as field days, tours, demonstrations etc. are consistent with these two styles and should continue to be utilized. In addition, active experimentation was preferred for agricultural topics related to physical farming while abstract conceptualization or reflective observation were preferred for activities such as markets and prices, whole farm planning and financial management. These recommendations are excellent. From a practical standpoint, this reader has some questions. How will this information be utilized in Iowa? Will the stakeholders who provide adult education programs to farmers be inserviced or made aware of the findings of this study? What additional studies are planned so the recommendations may be generalized to the entire population? This research has potential to be extremely beneficial to educational providers of adult programs for farmers.