

Identifying and Applying Learning Modes To Risk Management Education to Iowa Farmers

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Abstract

Kolb has identified three main areas of human development related to learning. The last stage relates to adults and how they tend to rely on more than one learning mode. Kolb has identified four learning modes related to adult learning. At the same time, many authors have stressed the need for farmers to have a clear understanding of the risk in farming and how to manage those risks. The purpose of this study was to determine the preferred learning mode of Iowa farmers for risk management education using Kolb's learning modes. Secondary purposes were to gather data on the importance of six sources of risk in farming and the preferred delivery method of farmers in learning how to manage those risks. A descriptive survey research design was used. Data were collected from three groups of farmers through the Iowa Farm Bureau Federation. Data were obtained from 130 farmers using a five-part self-administered questionnaire.

Farmers were asked to rate the importance of six sources of risks in farming using a 5-point Likert-type scale. The results indicated that market/price risk was of greatest importance to them followed by institutional risk and financial risk. The farmers were also asked to indicate their most preferred and least preferred learning mode for each of the six sources of risk using Kolb's learning modes. Abstract conceptualization (learning by thinking/analyzing/using logic) was the most preferred learning mode for all six sources followed by active experimentation (learning by doing and experimenting). More than 60% of all the farmers preferred either of these modes. Eight general classifications of program delivery for risk management education were identified. Over 50% of the respondents indicated that non-formal classes and popular press print media were the most preferred delivery methods for nearly all sources of risk.

In summary, although the results of this study cannot be generalized to all Iowa farmers, the results, nevertheless, provide information to agricultural educators about the planning and delivery of risk management education. Consistent with widely accepted learning theories, it appears that farmers prefer to learn about risk and risk management by critical thinking and experimenting with non-formal classes and popular press print media being the most preferred delivery methods.

Introduction/Theoretical Framework

Adult learning is emerging into a new frontier as an increasing number of adults seek additional educational opportunities (Moore & Waldron, 1981). The knowledge explosion has enhanced the need for life-long learning and the demand for people to know more about their home and on-the-job surroundings (Gordon & Souza, 1980). At the same time, many educators believe that adults bring a wide variety of experiences with them to their educational settings

according to Slotnick (1993), Smith and Haverkamp (1997), Knowles (1984), and Apps (1988). It is this rich experience base that enhances adult learning.

Kolb (1984) has identified three main areas of human development related to learning. The first stage is from infancy to about age 15, at which time childhood development occurs. The second stage (described as specialization) occurs from age 16 to 40. An individual tends to specialize in that he/she chooses a vocation, a place to live, a field to study and begins to rely more on a particular mode and style of learning. Competence in a particular area is developed. The last stage of the human development process, as described by Kolb, is called integration (age 40 and beyond), whereby an individual feels the need for personal fulfillment. Conflict between the need for specialized competence and personal fulfillment often occurs. An individual in this stage may rely upon more than one learning mode.

Kolb (1984) has identified four learning distinct learning modes that individuals tend to prefer during the specialization and integration stages. His four learning modes are called: concrete experience (learning by feelings/hunches/intuition or specific experiences), reflective observation (learning by observing/watching/listening to others), abstract conceptualization (learning by thinking/analyzing/using logic to solve problems), and active experimentation (learning by doing and experimenting on own).

In agriculture, Klair (1998) states that farmers need to understand the changing need of agriculture at home and abroad and carefully consider how to adapt their businesses to those changes. To be successful in this rapidly changing global economy, farmers, educators, and researchers will need a clear understanding of risk and how to manage it (Harris, Benson, & Rosson, 1998). By managing risk, farmers are better able to stabilize farm income and to ensure that funds will be available to fulfill both business and family-related obligations (Hansen & Pederson, 1998).

Risk and uncertainty is very evident in farming. Many factors, such as weather, crop and livestock diseases, insects, adoption of new technologies, fluctuating prices, and government programs and policies all create a risky situation for farmers. Nelson (1997) defines risk and uncertainty as situations that have many possible outcomes regardless of their desirability. Five common sources of risk found in farming have been identified and widely reported (Hardaker, Brain, Hurine, & Anderson, 1997); Boehlje & Trede, 1977); Baquet, Hambelton, & Jose, 1997; Fleisher, 1990; Kay & Edwards, 1994). The five common sources of risk are: 1) production risk, 2) price or market risk, 3) institutional risk, 4) human or personal risk, and 5) financial risk. Production risk refers to the uncontrollable events in the production of crops or livestock that can result in undesirable outcomes. Examples include weather, crop and livestock diseases, insects, extreme temperatures, and others. Price/market risk reflects the risks associated with fluctuating input and output prices that may occur after the commitment to production begins. Institutional risk results from changes in policies and regulations that affect farming. Examples include changes in government rules regarding the use of pesticides, livestock drugs, disposal of animal waste, land use and conservation, and others. Human/personal risk can result from disruptive changes from such events as death, divorce, injury, or poor health. Lastly, financial risk is impacted by the way the farmer obtains and finances capital. Examples would include fluctuating

interest rates, leverage, and cash flow management. For the purposes of this study, production risk was subdivided into crop production risk and livestock production risk, making a total of six different sources of risk in farming.

To mitigate the losses from these sources of risk, farmers must formulate risk management strategies. Risk can not be totally eliminated but through good management practices, it can be reduced. Edwards (private communication, November 4, 1999), therefore, defines risk management [education] as those production, marketing and business management practices that will allow farmers to carry a degree of risk that is consistent with their financial resources and personal preferences.

Many educators have stressed the need for risk management education for farmers. Klair (1998), Nelson (1997), and Pena (1999) concluded that educational programming in risk management should be pursued as a high priority to help farmers assess and plan their future successes. Jose (1998) emphasizes that changes in agriculture pose a major risk for farmers, and those changes create an urgency to develop and deliver educational materials that will meet farmers' needs. Coble and Barnett (1999) stress the need for effective communication of risk management results. Pena (1999), based upon focus group research of Texas and Kansas farmers, concluded that farmers see risk management as a very broad concept. They found that the top three sources of risk were related to revenue (price and yield) and input costs [price/market risk, financial risk, and crop production risk]. Coble, Knight, Patrick, and Baquet (2000) stress the importance of teaching fundamentals of risk management followed by more specific programs.

Purpose/Objectives

The primary purpose of this study was to determine the preferred learning mode of Iowa farmers for risk management education using Kolb's learning mode descriptors. Secondary purposes were to gather data on the importance of the six sources of risk commonly found in Iowa agriculture and to determine the preferred learning mode and delivery method of risk management education to mitigate these sources of risk.

The specific objectives of the study were:

- 1) To determine the importance of the six sources and sub-topics within each source of risk in farming to Iowa farmers.
- 2) To determine the most preferred and least preferred learning mode for each of the six sources of risk based upon Kolb's learning modes.
- 3) To determine the most preferred and least preferred delivery method of risk management education by source of risk

This study is a portion of a larger study dealing with the perceptions of Iowa farmers towards risk management education and the delivery of risk management education (Mickelsen, 2001). Additionally, it is one component of an on-going research project within the Iowa

Methods/Procedures

This study used a descriptive survey design. This type of research is grounded in the need to describe and interpret what is and attempt to measure what exists without questioning why it exists (Borg and Gall, 1989). Data from descriptive research can lead to the improvement of education and educational delivery systems (Borg and Gall, 1989).

In order to investigate this topic fully, a random sample of all Iowa farmers should be conducted. However, given the time and financial constraints of this study, a random sample was not feasible. As an alternative, a purposive sampling procedure was used. Ary (1996) states that in purposive sampling (also known as judgment sampling), sample elements judged to be typical or representative are chosen from the population.

The Iowa Farm Bureau Federation provided assistance in identifying three groups that could be used for the study; namely, a sample of Iowa Farm Bureau Federation members who are actively involved in farming, younger farmers attending the Iowa Farm Bureau Young Farmers Conference, and farmers participating in the Iowa Farm Bureau Risk Management Conference. Data were collected from 130 farmers. Farmers from the mail survey were not part of the two conferences.

Based upon the objectives of the study, a survey instrument was developed by the researcher. The questionnaire was divided into six parts. Part 1 was designed to gather data on the importance of various risky events in farming using a 5-point Likert-type scale. Parts 2 and 3 measured the farmers' perceptions toward risk management, risk management tools and strategies, and their attitude and action towards various risk management strategies. Parts 2 and 3 also used a 5-point Likert-type scale. Part 4 had two major purposes; namely, to determine the farmers' preferences towards how they would like to learn about risk and risk management and their most and least preferred delivery methods for risk management education. Kolb's learning modes were used to determine their preference towards how they would like to learn. Part 5 assessed the farmers' risk management profile, while part 6 collected data on the demographic characteristics of the farmers. This paper reports on the findings and conclusions from Parts 1 and 4 from the survey.

A panel of experts consisting of farmers (not included in the study), risk management specialists, agriculture teachers, extension educators, and ISU professors reviewed the instrument to ensure content and face validity. Some minor changes were made as a result of this review. Additionally, Cronbach alpha reliability scores were determined for Parts 1, 2, and 3 of the survey instrument. Reliability scores were .91, .66, and .82 for Parts 1, 2, and 3, respectively.

All data from the three groups were combined into one data set after a review of the demographic data for each individual group. According to M. Shelly, Professor of Statistics/Political Science, this procedure of combining groups into a single data set is an

acceptable research methodology when using purposive sampling (Private communication, May 14, 2001).

Results/Findings

Importance of sources of risk in farming. Respondents were asked to rate the importance of several issues within each of the six sources of risk in farming. A five-point Likert-type scale was used ranging from 1=extremely unimportant to 5=extremely important. Grand means for the overall importance of each source of risk were calculated. The results are shown in Table 1.

Market/price risk (mean=4.06) rated the highest in terms of importance for the six sources of risk. It was followed by institutional risk (mean=3.97). Financial risk, human/personal risk, and crop production risk were nearly equally rated in terms of importance as a source of risk by the farmers. Their grand mean scores varied from 3.76 to 3.82.

Within the area of market/price risk, the farmers rated the issue of narrow operating margins, market access for selling products, and the volatility of commodity prices as being the most important. All three individual issues had means of 4.0 or greater indicating that they were very important. In fact, when comparing all of the issues identified and shown in Table 1, these three were among the highest rated in terms of importance.

Changes in government policy/regulations and changes in government farm programs were the two highest rated issues within institutional risk. Both of these issues rated as being very important (mean of 4.0 or greater). They were closely followed by foreign restrictions on farm products and export trade barriers.

Financial risk was the third highest rated source of risk by the respondents (mean = 3.82). Important issues, as rated by the farmers, were having an adequate supply of capital, the recovery time needed from a depressed agricultural economy, and lenders=knowledge of agriculture. Interestingly, the volatility of interest rates was the lowest rated issue within financial risk.

Other major issues identified as being very important to the respondents included death of or injury to an owner/operator (human/personal risk) and weather, wind, hail, etc. (crop production risk). These individual issues were rated as very important with means of greater than 4.0. Several issues related to livestock production were among the lowest rated by the farmers. Demographic data of the respondents revealed that most respondents did not have a livestock program; hence, livestock production risk was of little or no importance to them.

Learning mode and source of farming risk. The farmers were asked to indicate their most preferred and least preferred learning mode for each of the six sources of risk in farming. The learning modes were those identified by Kolb (1984). They are: abstract conceptualization (learning by thinking/analyzing/using logic), active experimentation (learning by doing and experimenting on own), concrete experience (learning by feelings/hunches/intuition or specific

Table 1

Means And Standard Deviations For The Importance Of Sources Of Risk In Farming.

Risk Type	n	Mean	SD
Market/Price Risk			
Narrow operating margins	128	4.33	.691
Accessibility to markets to sell products	129	4.17	.870
Volatility in commodity prices	129	4.14	.751
Global economic conditions	130	3.99	.849
Fluctuating costs of inputs	129	3.94	.794
Trade agreements (NAFTA, etc.)	130	3.73	1.018
<i>Grand Mean</i>		4.06	.575
Institutional Risk			
Changes in government policy/regulations	130	4.05	.800
Changes in government farm programs	130	4.04	.834
Foreign restrictions on products (GMO, etc.)	128	3.96	1.041
Export trade barriers (tariffs, etc.)	130	3.91	1.368
State/federal environmental regulations	129	3.87	.857
<i>Grand Mean</i>		3.97	.742
Financial Risk			
Adequate supply of capital	130	4.05	1.051
Recovery time from depressed ag. economy	120	4.04	.943
Lenders=knowledge of agriculture	129	4.01	.935
Business cycles in agriculture	130	3.69	.979
Volatility in interest rates	129	3.64	.998
<i>Grand Mean</i>		3.82	.740
Human/Personal Risk			
Death of owner/operator	127	4.18	.982
Injury to owner/operator	127	4.08	.909
Lawsuits	128	3.69	1.118
Injury to hired help	128	3.53	1.248
Divorce of owner/operator	128	3.53	1.360
<i>Grand Mean</i>		3.80	.869
Crop Production Risk			
Weather, wind, hail, etc.	130	4.22	.847
Disease, insects, weeds	129	4.00	.760
Use of new crop varieties	128	3.64	.740
Adoption of new technology/methods	130	3.52	.684
Consolidation of input suppliers	127	3.42	1.043
<i>Grand Mean</i>		3.76	.510

(table continues)

Risk Type	n	Mean	SD
Livestock Production Risk			
Adequate market outlets for livestock	123	3.68	1.752
Disease	123	3.51	1.729
Initial investment cost of facilities	123	3.29	1.663
Regulations on production practices	122	3.16	1.623
Adoption of new technology/methods	123	2.97	1.496
Obsolescence of facilities	120	2.65	1.553
Grand Mean		3.19	1.53

Note. 5-point Likert scale. 0=no opinion; 1=extremely unimportant; 2=very unimportant; 3=somewhat important; 4=very important; 5=extremely important

experiences), and reflective observation (learning by observing/watching others and listening. The number of responses and the percentage distribution of those responses are shown in Table 2.

Abstract conceptualization (AC) was the most preferred learning mode for all six sources of risk followed by active experimentation (AE). More than 60% of all farmers preferred either of these learning modes for all sources of risk. In fact, for crop production risk, over 70% of the farmers preferred AC or AE. Two exceptions were noted in that for financial risk and institutional risk, reflective observation (RO) was the second-most preferred rather than AE. Since AC was the most preferred, this would suggest that farmers, regardless of the type of risk, prefer to learn about risk by thinking and analyzing and using logic to solve problems related to risk. Additionally, since AE was the second-most preferred learning mode by the farmers, this would suggest that farmers like to complement their thinking/analyzing/logic with learning by experience and experimenting on their own in order to solve risk management problems rather than using concrete experience (CE) or reflective observation (RO).

Concrete experience (CE) was the least preferred learning mode for all sources of risk. It was followed by reflective observation (RO). Again, one-third or more of the farmers considered concrete experience as their least preferred learning mode, and three-fourths of the respondents considered concrete experience and reflective observation as their least preferred learning mode for all sources of risk. This would indicate a strong preference by the respondents to not learn about risk by learning from their feeling/hunches/intuition or by observing and watching others.

In summary, the data from Table 2 suggest that the respondents prefer to learn about risk by thinking and analyzing or experiential learning and strongly prefer not to learn about risk from their own feelings/hunching and observing and watching others.

Delivery methods for risk management education. Educational providers of risk management education utilize a wide variety of delivery methods and instructional technologies to provide education in risk management. Eight general classifications representing these methods and technologies were identified by the researchers with assistance from the panel of experts. The major classifications identified were: educational print media (EPM), popular press print media

(PPPM), video media (VM), audio media (AM), non-formal classes/meetings (NFC), formal classes (FC), computer assisted instruction (CAI), and distance education (ICN).

Table 2. Most Preferred And Least Preferred Learning Mode By Type Of Farming Risk

Risk Type	Mode*	Most Preferred		Least Preferred	
		n	Pct.	n	Pct.
Crop Production Risk	Active conceptualization (AC)	37	37	8	11
	Active experimentation (AE)	34	34	10	13
	Concrete experience (CE)	7	7	35	47
	Reflective observation (RO)22	22	22	29	
Livestock Production Risk	Active conceptualization (AC)	37	42	4	4
	Active experimentation (AE)	23	26	10	16
	Concrete experience (CE)	10	11	32	49
	Reflective observation (RO)19	21	20	31	
Market/Price Risk	Active conceptualization (AC)	34	34	8	11
	Active experimentation (AE)	29	29	13	18
	Concrete experience (CE)	16	16	32	44
	Reflective observation (RO)21	21	20	27	
Institutional Risk	Active conceptualization (AC)	33	38	6	10
	Active experimentation (AE)	19	22	13	21
	Concrete experience (CE)	12	14	28	45
	Reflective observation (RO)23	26	15	24	
Human/Personal Risk	Active conceptualization (AC)	42	44	6	9
	Active experimentation (AE)	19	20	13	19
	Concrete experience (CE)	18	19	27	39
	Reflective observation (RO)16	17	23	33	
Financial Risk	Active conceptualization (AC)	47	49	8	11
	Active experimentation (AE)	17	17	12	16
	Concrete experience (CE) 11	11	31	43	
	Reflective observation (RO)22	23	22	30	

* AC (active conceptualization): learning by thinking/analyzing/using logic
 AE (active experimentation): learning by doing and experimenting on own
 CE (concrete experience): learning by feelings/hunches/intuition or specific experiences
 RO (reflective observation): learning by observing/watching others and listening

Respondents were asked to indicate their most preferred and least preferred method or technology for learning about each of the sources of risk. The results are shown in Table 3. Data are presented for each delivery method within each source of risk.

Very few differences were noted regarding the most preferred delivery method for all six major sources of risk. Non-formal classes rated the highest for all sources of risk except for human/personal risk. In that case, popular press print media rated the highest. Popular press print media rated second for the other five sources of risk.

Table 3. Most Preferred And Least Preferred Delivery Method Of Risk Management Education By Type Of Farming Risk.

Risk Type	Method*	<u>Most Preferred</u>		<u>Least Preferred</u>	
		n	Pct.	n	Pct.
Crop Production Risk	EPM	13	16	4	5
	PPPM	25	31	4	5
	VM	3	4	6	8
	AM	0	0	17	22
	NFC	30	36	3	4
	FC	3	4	15	20
	CAI	6	7	18	24
	ICN	2	2	9	12
Livestock Production Risk	EPM	12	16	2	3
	PPPM	21	28	5	7
	VM	2	3	8	12
	AM	0	0	14	20
	NFC	27	37	1	1
	FC	2	3	13	19
	CAI	9	12	15	22
	ICN	1	1	10	14
Market/Price Risk	EPM	7	9	4	5
	PPPM	22	27	7	9
	VM	5	6	6	8
	AM	0	0	18	24
	NFC	29	35	1	1
	FC	5	6	9	12
	CAI	12	15	15	20
	ICN	2	2	15	20
Institutional Risk	EPM	18	24	4	6
	PPPM	16	21	6	9
	VM	3	4	9	13
	AM	2	3	10	14
	NFC	24	32	2	3
	FC	4	5	13	19
	CAI	6	8	12	17
	ICN	2	3	13	19

Human/Personal Risk	EPM	15	19	2	3
	PPPM	24	30	7	10
	VM	7	9	5	7
	AM	3	4	15	21
	NFC	21	26	3	4
	FC	4	5	12	16
	CAI	4	5	17	23
	ICN	2	2	12	23
Financial Risk	EPM	14	18	3	3
	PPPM	23	29	5	7
	VM	3	4	9	12
	AM	0	0	13	18
	NFC	22	18	2	3
	FC	10	13	11	15
	CAI	6	8	16	22
	ICN	1	1	15	20

Note.

EPM = educational print media (extension bulletins, fact sheets, study packets, university newsletters)

PPPM = popular press print media (farm magazines; trade publications, newspapers)

VM = video media (video tapes, television, slide presentations, satellite dish/direct TV)

AM = audio media (cassette tapes, radio programs)

NFC = non-formal classes/meetings, (extension meetings, trade seminars, adult field days)

FC = formal classes (university and community college credit courses/seminars)

CAI = computer assisted instruction (Internet, WWW, CD ROM, information services)

ICN = distance education (Iowa Communications Network)

Combining the top two responses for the most preferred delivery method shows that for all sources of risk, either non-formal classes or popular press media were the most preferred except for institutional risk. In that situation, educational print media rated second. It should be noted that over 60% the respondents preferred non-formal classes or popular press print media for learning about crop production, livestock production, and market/price risk.

The respondents were slightly more varied in their responses regarding their least preferred method of delivery. Computer-assisted instruction was the least preferred method of delivery for crop production, livestock production, human/personal, and financial risk. Distance education and formal classes were least preferred methods for institutional risk while audio media was least preferred for market/price risk.

The responses were combined to show the three least preferred delivery methods. Audio media, formal classes, and computer assisted instruction were least preferred for production risk (68% of the total) and livestock production risk (61% of the total). Sixty-four percent of the

respondents indicated that audio media, computer-assisted instruction, and distance education were the least preferred methods for market/price risk. This compared to 60% of the total for financial risk. For institutional risk, the three least preferred methods were formal classes, computer-assisted instruction, and distance education (55% of the total) compared to audio media, formal classes, computer assisted instruction, and distance education (73% of the total) for human/personal risk.

In summary, non-formal classes and popular press print media were generally the most preferred delivery methods. Audio media, formal classes, computer assisted instruction, and distance education were generally the least preferred delivery methods.

Conclusions/Recommendations/Implications

Several conclusions and recommendations can be made from the results of this study. Implications to agricultural educators are noted wherever appropriate.

1. The farmers in this study generally agreed that all sources of risk were somewhat important to very important. Market/price risk rated the highest (mean=4.06) and livestock production risk the lowest (mean=3.19) . For agricultural educators, this would indicate the importance of risk management education as an educational priority program.
2. When asked to indicate their most preferred learning mode (based upon Kolb's descriptors) for each type of risk, active conceptualization and active experimentation were the two most preferred except for financial risk. More than 60% of the farmers preferred either AC or AE for all sources of risk. This would suggest that agricultural educators design teaching/learning activities that emphasize problem-solving and critical thinking when planning risk management education programs. Coupling these types of teaching/learning activities with learning by experience and self-experimentation would be highly effective in terms of learning mode preferences by these farmers.
3. Concrete experience (CE) or learning by feelings/hunches/intuition appears to be the least preferred learning mode by nearly 50% of the respondents for all types of risk.
4. Very few differences were noted regarding the most preferred delivery method for all six types of risk. Non-formal classes rated the highest for all types of risk except for human/personal risk. In that case, popular press print media rated the highest. Popular press print media rated second for the other five types of risk. These preference indicate that farmers prefer non-formal classes to learn about risk. Examples would include extension meetings and conferences, agri-business sponsored meetings, trade seminars, workshops at field days, etc. Since popular press print media was also highly rated, then educational providers should consider news releases, farm magazines, newspapers, and trade publications when providing education on risk management.
5. The respondents were slightly more varied in their responses regarding their least preferred delivery method. Computer-assisted instruction, distance education, and

formal class (credit courses) were the least preferred. These results indicate a need for additional research and education of farmers on cutting-edge instructional technologies, particularly distance education.

6. Combining the most preferred learning mode with the most preferred delivery method would indicate that these farmers would show a preference for non-formal classes that emphasize problem-solving and critical thinking/analysis when learning about risk management. In turn, they would prefer to combine these with their own experiential learning and experimentation. Therefore, agricultural educators should consider these learning mode/delivery method combinations when planning risk management education programs.
7. This study supports the Kolb concept that persons in the specialization or integration stages of learning tend to prefer more than one learning mode. The fact that more than 60% of all the farmers preferred either abstract conceptualization or active experimentation for learning about all sources of risk tends to support Kolb's theory.
8. This study supports the findings of Pena (1999) in terms of the importance of the sources of risk. Additionally, it confirms the findings of Coble (2000) regarding teaching strategies for risk management education.
9. While these results may not be generalized to the entire population of Iowa farmers, they, nevertheless, are indicative of preferred learning modes and delivery methods for risk management education. This study should be replicated to more fully discern effective teaching/learning and delivery models for this important topic for farmers.

In conclusion, many agricultural educators have advocated the importance of risk management education for farmers. This study has added to the body of knowledge regarding the most effective teaching/learning activities and delivery of that education based upon established and well-recognized learning theories.

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