

Application of Marketing Techniques to Extension Programming Decision Making: Minnesota livestock producers' preferred topics, informational formats, and outreach methods concerning land application of manure

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Abstract

A combination of focus groups and pre-discussion survey with livestock producers was employed to identify their preferred Extension education methods and topics. The focus groups took place in the spring and summer following a winter education program conducted at the county level that focused on manure application practices, nutrient management, and protection of sensitive areas. By exploring issues in detailed discussions with small groups of producers, we gained information and valuable insights that can guide future information, communication, and education efforts to serve this audience. We were also following an important principle of adult education: the audience or participants should have the opportunity to inform the topics or issues covered, as well as the media or format used. By discussing and surveying the practices they employ and the reasons for not adopting recommended practices, we also gained knowledge about the topics or issues that ostensibly *should* be addressed—through Extension outreach and/or through regulatory, incentives-based, or social-marketing approaches. We found that among seven suggested 'educational items or opportunities', the preferred format was 'publications'. We present some advantageous features of the focus group-questionnaire combination of approaches, including the fact that by beginning with the questionnaire, participants had time to reflect on the questions prior to entering into discussion. We conclude that the combination is effective. However, the resources required for employing both methods is significantly higher than for one method alone, suggesting that the use of the combination is more appropriate for relatively larger projects or programs.

Project Background

A combination of focus groups and written survey was employed with livestock producers to identify their educational preferences with respect to land application of manure. The focus groups took place in the spring and summer following a winter education program on manure application practices, nutrient management, and protection of sensitive areas. The detailed report of the results of those sessions was reported by Vickery (2002).

In 2000, the Minnesota Pollution Control Agency promulgated revisions to the state feedlot rules (MPCA, 2000). The rules address feedlot registration, permitting, and design, manure-nutrient

application rates management of manure in environmentally sensitive areas, and other environmental topics concern. The University of Minnesota Water Resources Center and Extension Service (Extension) coordinated with state agencies to secure funding for and plan an education program. In the first year of the program (2001), information was delivered on feedlot registration, permitting, discharge restrictions, and other basic requirements. Workshops in the second year focused on the requirements for land application of manure.

The new rules came about because of: 1) the growing public concern in the 1990s about the increase in numbers of large feedlots and the associated environmental and human health effects; and 2) a legislative audit report of 1998 (see MPCA, 2003). One of the primary conclusions of that report was that the feedlot rules—last revised in 1978—were out of date.

During the second year of workshops, the project leaders decided that rather than further evaluate the training program per se, the remaining resources should be applied to learning what was to be done next: What did the farmers want to learn or find out and in what format did they want to get the information?

Theoretical Context Brief

Principles of Adult Education, ‘Andragogy’

Our common sense-based interest in asking the target audience what they wanted has support in the theoretical literature of adult education. For example, among the principles espoused by Knowles—one of the best known adult education theorists and popularizers—(see e.g., Friedman, 2002) are the following as summarized by Atherton (2003):

- **The need to know**—adult learners need to know why they need to learn something before undertaking to learn it.
- **Learner self-concept**—adults need to be responsible for their own decisions and to be treated as capable of self-direction

An external motivator—the new state regulations—was the primary need-to-know standpoint of the two years of educational programming preceding the questionnaire-focus group study. Future outreach efforts could or should also rely on internal or self-interested, need-to-know motivators such as environmental ethics, farm management efficiency, and financial benefits.

Knowles popularized the concept and practice of andragogy—the adult education version of pedagogy. Peter Jarvis (2001) has described Knowles’ development of androgogy as “the first major attempt in the West to construct a comprehensive theory of adult education.” A relevant, but simplistic, synoptic comparison here is “In pedagogy, the concern is with transmitting the content, while in andragogy, the concern is with facilitating the acquisition of the content (Clark, 1999). Although, he originally described them as distinct fields with a dichotomy of methods, Knowles later emphasized a relationship better treated as a continuum and that each field could borrow methods from the other in appropriate contexts.

Learning Styles

There are many analytical frameworks for understanding an individual's preferences with respect to learning, communication, and interaction. In Robert Smith's *Learning to Learn* (1981), 17 learning styles inventories are characterized in an appendix

However, an education/information format preference is influenced by factors other than 'learning mode preference'. A farmer may not necessarily prefer to learn by reading documents, but if s/he can skim a newsletter or read a fact sheet during a lunch break, that may be the practical thing to do. Producers can visit an Extension website at their convenience—for an hour during the evening or when the weather is bad. Travel is not necessary and if something comes up, the learning session can be resumed or postponed until another day. But, such is not the case for a workshop or a field day. Thus, while it is reasonable to assume that the learning style of our producer respondents were reflected in their questionnaire answers, we should also recognize that there are other, unrelated influences. Therefore, standard or simple analyses of questionnaire responses can lead to incorrect interpretations. This is why qualitative approaches like focus groups and interviews are used.

Although there is considerable information on learning style preferences for the general population and for numerous subgroups, relatively little information is available on farmers. Trede and Miller (2000) studied a selected subset (a 'purposive' or judgment' sample) of Iowa farmers via mail survey. In addition to be concerned specifically with the learning styles and preferences of farmers, the Trede and Miller study was conducted relatively recently (1999), involved a reasonably large sample size (289), and of course, concerned a participant sample or audience that is very relevant with respect to water outreach programming. The similarity in the participant sample for our two, unrelated studies is about as close as could be hoped for—farmers in neighboring states. The present author's sample was narrower, however, being limited to livestock producers.

For a mail survey, the Iowa study was quite lengthy, with components to address the following objectives:

- 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.
- To determine the preferred learning mode of the respondents for selected agricultural topics.
- To determine the perceived effectiveness of selected learning activities and the impact of learning style on those learning activities. (op cit, P. 340)

Using the Kolb Learning Styles Inventory (e.g., Kolb, 1999), they found that:

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 (p. 346).

Many might expect farmers to generally have learning styles that emphasize the concrete and practical. It turns out that such is the case, but not for all topics. The results relating to the second objective listed above demonstrated that the farmers’ preferences varied by topic:

. . . 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) [was] the preferred learning modes for more critical thinking activities such as markets and prices, whole farm planning, and financial management. (p. 338)

Methods Synopsis

Eight farmer focus groups were conducted in four counties in different parts of the state. Each pair of focus groups in a county consisted of one group who attended a winter workshop (‘Attendees’) and another group of participants who had not attended (‘Non-Attendees’). The Focus Group proper was preceded by a three-page questionnaire to get the participants thinking about issues that would be explored in more detail during the course of the discussion. The participants retained the questionnaire through the discussion and were asked to refer to it at different points during the session. The focus group sessions were recorded on audiotape. Abbreviated transcripts for each session were prepared. The key findings from the focus groups were developed from the transcripts using the “long table analysis” procedure described by Krueger and Casey (2000).

Selected Results

Questionnaire

The three-page questionnaire consisted of three sections:

- Adoption of recommended practices
- Preferences for education topics
- Preferences for education or information delivery methods

Selected Results and Summary: Topics

Summary results for the second and third sections listed above are given in Table 1.

The topics of relatively higher interest based on both the ‘counts’ (16 or 17) and ‘percentage’ statistics (‘yes’ + ‘maybe’ > 80%) were

- F. Field selection: soil P levels and manure application rates
- G. Managing sensitive areas
- I. Applying and incorporating manure

Table 1

Producers' assessment of likelihood of attending or participating in educational programming: results for all questionnaire respondents (N = 51) & top choices for topics

Lettered topic / questionnaire item	All participants			
	Count	Percent		
	Top choice *	Yes	Maybe	No
A. Calibrating my manure spreader	9	18	47	35
B. Manure sampling and nutrient content analysis	17	29	49	22
C. Soil sampling and testing	10	20	29	51
D. Manure application record keeping	11	31	51	18
E. Using UM Extension tables to calculate application rates	7	24	67	10
F. Field selection: soil P levels and manure application rates	16	33	61	6
G. Managing sensitive areas	16	41	43	16
H. Written nutrient management plan	12	35	57	8
I. Applying and incorporating manure	17	34	58	8
J. Determining total acres needed for all of my manure	7	47	35	18

*For 'Top' choice, respondents were allowed to list up to three choices. Most gave three. Results are given as counts or number of times listed or named.

Selected Results and Summary: Format Preferences

Selected results.

Table 2
Participant rankings of informational formats and educational opportunities

Item or opportunity	All eight focus group sessions combined		
	Average of the median*	N = 51	
		No. of times ranked	
		First	Last
Publications	1.81	19	5
Farm tours/demonstrations	2.25	14	4
Newsletter, 'update', or periodic bulletin	2.25	11	9
Workshops	2.44	12	4
Farm visit by specialist or consultant OR one-one assistance	2.69	13	14
Comprehensive website	3.37	4	17
Nutrient management computer software	3.81	6	22

*The mean of the median of the rank assignments from the eight participant groups.
Not adjusted for the number of participants in each group (varied from 4 to 7) or otherwise.

Summary

- 'Publications' is the item or opportunity for which there is the most interest. Nineteen of 51 participants gave it a rank of '1' (with the next highest item with '14'). It had the second lowest number of 'last' rankings at 5 (Workshops and Farm tours had 4 each). Publications also had the lowest 'average of the median rank' at 1.81.
- There is relatively low interest in 'Comprehensive website' and 'Nutrient management computer software'. These items had the highest number of 'last' rankings (17, 22), the lowest number of 'first' rankings (4, 6), and the highest 'average of the median rank' values (3.37, 3.81).
- Farm visit or one-on-one assistance had somewhat mixed results, receiving high to intermediate numbers of both 'first' (13; range: 4-19) and 'last' (14; range: 4-22) rankings and a high-to-intermediate value for average of the median rank (2.69; range: 1.81-3.81).

Discussion

The farmers' preferences can be analyzed from a number of perspectives and theoretical frameworks such as:

- Instructor-centered versus learner-centered teaching
- Information delivery versus education
- Thinking style

- Learning style preferences
- Multiple intelligence

‘Publications’ and ‘Newsletter’—the top and third highest ranked here—are the ones that are most strictly informational in nature. In terms of one way of categorizing thinking styles—reflective, creative, practical, and conceptual—these two ‘formats’ are the ones best suited to the ‘practical’ style (“Instructor-centered,” 2000). ‘Farm tours/demonstrations’ and ‘workshops’ are the ones that are probably best identified as ‘educational’. Depending on their design, they could be instructor-centered or learner-centered, although the former is probably more common in practice. Depending on design and user preference, ‘Farm visit’ and ‘website’ can likewise serve in both or either fashions. If we shorten the list of learning style preferences to those most applicable in the present context—visual, auditory, and kinesthetic—we find that the questionnaire results indicate a relatively even balance between visual and auditory formats among the top four choices. There was an intermediate level of preference for the two formats that typically could offer the most opportunities for kinesthetic learning—‘farm tours’ and ‘one-on-one’.

From the educator’s perspective, ‘software’ and ‘one-on-one’, followed by ‘tours’, ‘workshops’ and ‘website’ are most likely to be ‘learner-centered’. Characteristic of learner-centered instruction are interpretation of knowledge, learning through discovery, learners setting their own pace, and instructors coaching and mentoring students to facilitate their learning (op cit).

In the study cited earlier by Trede and Miller, the investigators asked the farmers to rate the effectiveness of some 26 categories of learning activities (See Table 3), whereas in the present study, we used only seven formats or activities (See Table 2). While we used ranking, they used a Likert scale of 1 to 5 where 1=very ineffective, 2=ineffective, 3=no opinion, 4=effective, 5=very effective. The means were in the range of 3.00 to 4.05. “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.” In general, our results were not especially similar, but then our methods, the categories/activities and their number are not especially comparable. If we conflate field days, demonstrations, and (farm) tours, then this is one category for which there was high or moderate-to-high interest according to the results of both studies.

Table 3
Learning activity categories, from Trede & Miller (p. 345)

Talking with a consultant or specialist	Doing my own research on something new or different
Attending field days, tours, demonstrations	Reading and studying trade publications and technical journals
Attending a single meeting on a specific topic	Using a consulting or marketing service
Attending a series of in-depth meetings on a specific topic	Attending a meeting over the ICN
Studying and analyzing a problem on my own	Listening to radio broadcasts on specific topic
Participating in an educational activity that enhances lifelong learning	Watching a video tape
Experimenting on my own	Attending class sponsored by local high school
Attending a seminar/class sponsored by the Extension Service	Participating in community college credit class
Watching others and learning from them	Participating in credit class at university
Trying out new technologies/practices on my own	Watching a television program

Attending a seminar/class sponsored by an agribusiness firm	Listening to an audio tape on specific topic
Talking with family, friends, neighbors	Reading the newspaper
Reading and studying popular farm publications	Being the first in my neighborhood to try something new

Focus Groups

The focus group discussion was guided by a question sequence or ‘question route’ with three sections, including:

- Part 1. Covered barriers to adoption of Extension recommendations, with emphasis on application rates, record keeping, and the rules for sensitive areas
- Part 2. Covered education topics, methods and formats

Key Findings and Notes

The key findings were chosen from among the themes, comments, and suggestions offered by the participants. They were chosen on the basis of frequency, length or amount of time spent on them, and ‘extensiveness’ (number of counties and sessions). Participant comments are summarized in Vickery (2002), where the supporting quotes are given for each finding

Selected key findings and explanatory notes:

- Nutrient management Plans: assistance needed; involve private sector, agricultural professionals
- Those producers with some experience with NMP recognize that it not something they can readily do or would want to do themselves. They know they need assistance or training. In some cases, it is not clear where this assistance will come from. The participants suggest that more private sector agricultural professionals be trained to provide this service.
- Website as a source of information: important to some, but most farmers are not keen to use

There is quite a range in the level of interest and proficiency when it comes to computers and the Internet. However, most of the participants are not likely to use an Extension website very often.

Discussion

It turns out that these two key findings concerned the items or formats for which there was the least interest according to the questionnaire results. A likely interpretation here is that even though a producer might not personally use, have need for, or prefer a particular service or item, s/he may well be able to provide relevant advice and recommendations or convey preferences, either from his/her own perspective or from what s/he knows of other producers.

Qualitative and Quantitative Methods in Combination

Introduction

For our study, we used one qualitative and one quantitative method. Some general aspects of relevant comparison of the two approaches are summarized in Table 4.

Table 4
Comparison of Qualitative and Quantitative Methods

Aspect of comparison	Qualitative methods	Quantitative methods
methods of survey	focus group discussions	questionnaire
method of analysis	content analysis	descriptive statistics
point of view	the subject	the investigator
disciplinary paradigm	social sciences	natural sciences
logical reasoning	inductive	deductive
'language'	verbal, soft data	mathematical, hard data

Theoretical Considerations

Much has also been written in the form of comparison and contrast of qualitative and quantitative methodologies, as well as in regard to their use in combination. Although, many or most researchers use strictly one or the other approach, the nature of the two does not have to be treated as a strict dichotomy. As noted by Duncan (1992):

Observation, interviews, questionnaires and other tools, under the title of research methods, are not necessarily quantitative or qualitative *per se*. Second, any attempt to quantify involves a qualitative judgment, and vice-versa. Qualitative statements imply a certain hierarchy, number and magnitude that give form to meaning.

In an article exploring the paradigmatic underpinnings, limitations, and strengths of each, models of combination, and examples of application, Schulze (2003) describes three models of combination as formulated by Creswell (1994):

- Two-phase model
- Dominant less-dominant model
- Mixed methodology model

Our study is of the last category: both approaches were preplanned, carried out in conjunction, and received approximately equal resources and importance. Schulze takes a bit of a cautionary slant, noting: 1) that some may find problematic the combination of methods that have incongruous theoretical underpinnings; and 2) that mixed methods are best left to those who are experienced with both methods and fully understand the underlying paradigms. Caution notwithstanding, others feel that the use of both methods can lead to better or more comprehensive understanding and that furthermore, the results of one method can help refine investigations using the other. This last idea, employed purposefully, has been termed 'triangulation' (Scandura, 2002)

Combination Approach and the Present Study

Preferred Learning Formats

“Farm tour/demonstrations” was one of the preferred education formats identified by the questionnaire. However, from the focus group discussions, we learned that most participants would probably not attend. Farm tours just ranked high compared with the response choices offered.

Why Producers Do What They Do (or Why don't they follow official recommendations?)

According to our questionnaire results, there were only a few practices for which the survey results predicted that the implementation rate in 2004, would be less than 80 percent:

- Calibrate manure spreaders (74%)
- Follow recommended rates for nitrogen (71%, Non-Attenders)
- Adjust for phosphorous (62%, Non-Attenders)
- Properly manage sensitive areas (75%, Non-Attenders)
- Develop/update manure management plans (70%, Non-Attenders)

For most of these practices, the focus groups provided input on the reasons for relatively low rates of implementation and/or what Extension should do about it. With respect to rates, for example, they expressed doubt about the ability to closely match crop needs, because of the variability in the first- and second-year availability of nutrients. One recommendation was that more on-farm, nutrient rate demonstrations or experiments are needed, especially in parts of the state that are not well represented by Experiment Stations.

Findings Summary

Focus groups and questionnaires are not typically used in combination with the same set of participant-respondents. We found the combination useful in that:

- By beginning with the questionnaire, participants had time to reflect on the questions prior to entering into discussion.
- Since the farmers retained the questionnaires through the course of the session and were allowed to make changes in their responses, the questionnaire results could more accurately portray the participants' practices and preferences.
- The discussion phase helped us to better interpret the questionnaire results.
- By using two methods, we are more confident in the reliability of the results and our interpretation thereof, even though the sample size was relatively small for survey methods.

Regarding points one and two—these are only logical inferences. We did not try to measure systematically nor characterize anecdotally, the degree to which reflection and amendment took place. Probably more important was that by allowing the participants to retain their questionnaires, there was greater opportunity for the moderator to review the completed instruments on an individual basis to check for: 1) omissions, errors, and legibility; 2) correctness of interpretation, especially in cases where the respondents provided answers or annotations in their own words.

Summary and Conclusion

Focus groups have become a mainstay of qualitative research in the social sciences. Long used for marketing research in the for-profit sector, this method is now frequently employed in the public and academic sectors, often in the context of social marketing. Surveys, including written questionnaires, are the quintessential quantitative method in the social sciences. The use of the two methods in combination is not common. In the present study, we gave equal emphasis to each method, carrying them out on the same occasion with the same study subjects/participants. We found the combined approach useful, for we were able to be more confident in our conclusions, given the relatively small sample size. However, for each method, the development, administration, compilation, and analysis phases are time-consuming. Thus, investigators must keep in mind the potential value of the outcomes, before deciding to allocate the resources necessary for the combination approach.

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References

- Atherton, J.S. (2003). *Learning and Teaching: Knowles' Andragogy*. Retrieved May 10, 2004 at <http://www.dmu.ac.uk/~jamesa/learning/knowlesa.htm>
- Clark, D. (1999). *A Time Capsule of Training and Learning*. Retrieved Sept. 19, 2004 at <http://www.nwlink.com/~donclark/hrd/history/andragogy.html>
- Duncan, P. (1992). Qualitative and quantitative: Two styles of viewing the world or two categories of reality? In, Scrimshaw, N. & Gleason, G. Eds., *Rapid Assessment Procedures: Qualitative Methodologies for Planning and Evaluation of Health Related Programmes*. Boston, MA: International Nutrition Foundation for Developing Countries, Retrieved May 29, 2004 at <http://www.unu.edu/unupress/food2/UIN08E/uin08e06.htm>
- Friedman, J. (2002). *1970, Malcolm Knowles publishes The Modern Practice of Adult Education: Andragogy vs. Pedagogy*. In, Selected Moments of the 20th Century, Schugurensky, D., Ed. Retrieved May 28, 2004, from University of Toronto, Department of Adult Education, Community Development and Counseling Psychology, Ontario Institute for Studies in Education website: http://fcis.oise.utoronto.ca/~daniel_schugurensky/assignment1/1970knowles.html
- Jarvis, P., Ed. (2001). *Twentieth Century Thinkers in Adult and Continuing Education*. Second Edition. Sterling, VA: Stylis Publishing,
- Kolb, D. (1999). *The Kolb Learning Style Inventory, Version 3*. Boston, MA: Hay Resources Direct. MCB100K

- Krueger, R. A. & Casey, M. A. (2000). *Focus Groups: A practical guide for applied research* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- MPCA. (2000). *Minnesota rules, chapter 7020, animal feedlots*. Available at:
<http://www.pca.state.mn.us/hot/feedlots.html>
- MPCA. (2003). *2002 Feedlot Rules: Report to the Legislature*. Available at
<http://www.pca.state.mn.us/publications/reports/lr-feedlot-02.pdf> (See MPCA Feedlot Program Overview, P. 1)
- Instructor-centered versus Learner-centered Teaching. (2000). Retrieved on May 29, 2004, from Rochester Institute of Technology, Online Learning Web site:
<http://www.rit.edu/~609www/ch/faculty/learner.htm>
- Scandura, T.A. (2002). *Triangulation: Establishing Construct Validity through Mixed Methods*. Retrieved May 29, 2004, from Academy of Management, Research Methods Forum We site:
<http://www.aom.pace.edu/rmd/2002forum/editorial.pdf>
- Schulze, S. (2003). Views on the combination of quantitative and qualitative research approaches. *Progressio* 25(2):8-20. Retrieved May 29, 2004 at
http://www.unisa.ac.za/contents/faculties/service_dept/bld/progressio/docs/schulze.pdf
- Smith, R.M. (1982). *Learning How to Learn: applied theory for adults*. New York, NY: Cambridge, The Adult Education Company.
- Trede, L.D. & Miller, K.S. (2000). Assessing the Learning Styles of Iowa Farmers. *Proceedings of the 27th Annual National Agricultural Education Research Conference* (pp. 338-350). Available online at: <http://aaaeonline.ifas.ufl.edu/NAERC/2000/web/g2.pdf>
- Vickery, J.C. (2002). *Land application of manure: Minnesota livestock producers' practices and educational needs. Focus group and questionnaire results*. Project report available from University of Minnesota, Water Resources Center Web site:
<http://wrc.coafes.umn.edu/outreach/focus-groups.htm>