Response Rate and Stakeholder Attitude towards Use of Interactive Electronic Audience Response (Clickers) in Beef Extension Programming

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Summary and Implications
Effectively measuring short-term impact, particularly a change in knowledge resulting from extension programming can prove to be challenging. Clicker-based technology, when used properly, is one alternative that may allow educators to better evaluate this aspect of the logic model. While the potential interface between clicker technology and extension programming has been regularly hypothesized about, the success of use and stakeholder attitude towards such technology in an extension setting has not been well defined to date. Based on data collected during Iowa Beef Center winter extension programming, clicker-based technology yielded increased participant response rates when compared to hand-written program evaluations. Moreover, the technology effectively monitored change in knowledge and was viewed in an overwhelmingly positive manner by stakeholders. Thus, when used properly, clicker technology is well suited to extension as a program evaluation tool, and in particular an effective means by which to track short-term outcomes.

Introduction
Extension programming is built on the principle of providing education that impacts knowledge, behavior, or condition (Figure 1). Program evaluation, and in particular, measuring impact can be challenging as evaluation response rate and ease of data analysis may serve as barriers to educators   However, as changes in behavior and condition are often the focus of program evaluation, short-term outcomes such as in knowledge can be overlooked in the evaluation process. To truly measure knowledge change, baseline knowledge of program participants must be established. The burden associated with collecting baseline data often results in educators substituting Likert scale questions into end-of-meeting evaluations to gauge how much knowledge the participant feels that (s)he gained as a result of the program. While this perceived change in knowledge can be useful to educators, it still does not effectively measure change in knowledge.

One potential, and perhaps less invasive method for collecting pre- and post-program participant knowledge is through the use of interactive electronic audience response tools (clickers). When used correctly, clickers present an opportunity for educators to quickly collect anonymous (or distinctive) demographic data as well information on change in student knowledge without the need for end-of-session, handwritten surveys that often result in suboptimal response rates. Moreover, with use of accompanying software such as Turning Point 5 (Turning Technologies, Youngstown, OH), data can be easily analyzed by individual session or aggregated across many sessions for further analysis with a few clicks of a computer mouse.

The use of clickers in a formalized educational setting such as high school and college classrooms has been well characterized. And while many of the research reports have highlighted the potential benefits of clickers when used in extension programming, data regarding response rate and stakeholder attitude towards use of this technology are limited. Therefore, the objectives of this study were to compare clicker response rates with end-of-program written evaluation rates as well elucidate stakeholder attitude towards use of clicker technology.

Materials and Methods
A state-wide educational series on the subject matter of beef heifer development was conducted at 12 locations across Iowa in January and February of 2014. Stakeholder assessment with clickers was facilitated by the same extension professional at all 12 locations. Prior to the beginning of each meeting, clickers were activated and synchronized with the Turning Point 5 software. Clickers were either randomly placed at seats in the venue or handed out to attendees at check-in, and clicker identification was not affiliated with individual stakeholders at any point during assessment. It was explained that participation in any aspect of the program evaluation was sincerely appreciated but not required.

At initiation of the meeting, as part of the Microsoft® PowerPoint® presentation, a series of 6 questions including stakeholder age, size of farming operation, and operational challenges important to the subject matter were posed via Turning Point software. Depending on length of the questions and whether or not multiple responses were allowed, producers were allowed between 15 seconds and one minute to answer each question with their clicker. The subsequent educational program was comprised of 7

segments consisting of information relevant to the topic, specifically nutrition, health, reproduction, and genetics. At the beginning of 5 of the 7 segments, producers were asked to respond to a clicker question that ascertained their baseline knowledge or use of a management strategy related to a key concept that would be covered in more detail in ensuing slides. At the conclusion of each of those 5 segments, the same exact question was asked again with stakeholder answers recorded so that change in producer knowledge could later be calculated.

At the end of the presentation, producers were asked to use their clickers to respond to the comment "I like providing input using clicker as a partial substitute to written evaluations" on a Likert scale with options of strongly agree, agree, neutral, disagree, or strongly disagree.

In addition to clicker-based evaluation, a traditional hand-written evaluation was handed out to participants prior to the start of the last segment of the program. This evaluation allowed participants to provide anonymous feedback on various aspects of the meeting. This evaluation contained a combination of both multiple choice and open-ended questions that allowed them to expand on things they liked, disliked, or needed more information on to assist their operation.

At the conclusion of the series all clicker data were aggregated using Turning Point software and hand-written evaluations were compiled and tabulated in spreadsheet format. In some instances data were sorted by demographic grouping within Turning Point for further evaluation.

Results and Discussion
In total, there were 309 attendees of the state-wide series, 245 of which were unique stakeholders not affiliated

with implementation of the program. Based on participant responses, 30.2% were less than 30 years old, and 10.5% were greater than 65 years of age.

Although not the focal point of this article, it should be noted that use of the clicker technology was successful in tracking a change in knowledge of program participants. Specifically, the average correct response rate to baseline questions was 47.3%, and the average correct response rate to identical follow-up questions was 86.9%.

Of the 245 stakeholders at the meetings, 100% answered at least 1 clicker question through the Turning Point software and 90.6% (222/245) answered all 16 Turning Point questions using the clicker they were provided.

In contrast to clickers, response rate to the end-of-program written evaluation was lower and less complete. While 97.9% (240/245) of stakeholders responded to at least one portion of the written evaluation, only 15.9% (39/245) of evaluations were complete. The substantially lower completion rate was not surprising due to the open-ended nature of some portions of the written evaluation. However, only 52.2% (128/245) of participants responded to all of the questions on the written evaluation that were multiple choice or Likert-scale oriented.

In addition to increased response rate to clickers in this program series, 94.7% (231/244) of stakeholders had a positive attitude towards use of the clicker technology (Table 1). Furthermore, in stakeholders over the age of 65, 95.2% (20/21) of respondents were favorable towards clicker technology, while the remaining stakeholder was indifferent to the technology.
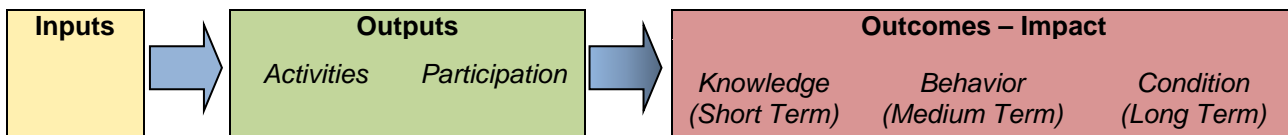

Figure 1. Logic model used for extension program development and evaluation.

Table 1. Stakeholder reaction to the statement "I like providing input using clicker as a partial substitute to written evaluations."

	Responses	
	Percent	**Count**
Strongly Agree	68.44%	167
Agree	26.23%	64
Neutral	4.51%	11
Disagree	0.41%	1
Strongly Disagree	0.41%	1
Totals	**100%**	**244**