Farmer and Farm Employee Understanding of Advisory Messages: The Case of Teagasc Pig Research Dissemination Day

This thesis is submitted to University College Dublin in fulfilment of the requirements for the degree of Masters of Agricultural Extension and Innovation

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Abstract

Purpose: The learning that takes place at agricultural communication events, particularly lecture-style presentations, occurs in the context of a complex and multifarious communication environment. This study addresses three important study questions: Are lecture-style presentations effective as a mechanism for linking farmers and farm-workers with new knowledge? What are the challenges to effective communication at lecture-style presentations from the perspective of farmers/ farm-workers, message deliverer and observers? At lecture-style presentations are mutual understandings between the speaker and the farmers/ farm employees achieved?

Design/ Methodology/ Approach: This investigation is a case involving farm owners and farm employees who attended a presentation at Teagasc's Pig Research Dissemination Day on May 31st 2017. The methods used to collect data for this case study were: questionnaires completed by pig farmers and pig farm employees; written recorded observations of audience members; and a semi-structured interview with the speaker/presenter at an information dissemination event.

Findings: The study found that while the lecture-style presentation was partially effective in communicating messages to attendees, there is scope for improvement. Challenges to communication were identified and these in some cases hindered the achievement of mutual understandings between the speaker and the attendees.

Originality/ Value: This study identified factors that aid and hinder the learning process involved in a public communication event with farmers and farm employees and points to areas for improvement.

Statement of Original Authorship

I hereby certify that the submitted work is my own, was completed while registered as a candidate for the degree stated on the title page, and I have not obtained a degree elsewhere on the basis of the research presented in this submitted work

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Bernadette Bennett   Date

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1. Introduction

This study addresses the effectiveness of lecture-style presentations for disseminating research to Irish pig farmers and pig farm employees. It concentrates on one presentation delivered at a pig research dissemination day and explores farmer/ farm employee understanding of messages delivered in this presentation. It examines some of the aids and barriers to farmer/farm employee learning from the perspective of farmers and farm employees, as well as the presenter and audience to the presentation. This study investigates the successfulness of one lecture-style presentation at the pig research dissemination day in advancing farmer/ farm employee knowledge.

In Ireland, information about new innovations, best practices and results from trials are commonly delivered from the advisory service to farmers and farm-workers through communication events and open days. As with all communication, there are many challenges associated with delivering messages to farmers and farm-workers effectively and there are numerous opportunities in communication where a message can be distorted and meanings changed or lost. Knowing how messages can become distorted or where they may become misinterpreted is essential when designing agricultural advisory events. Baccarani and Bonfanti (2015) suggest that 'speakers have to produce and disseminate knowledge, capture and keep alive the attention of their audience by arousing interest and curiosity, and leave a trace in the memory of their listener'. In order to fully engage with farmer and farm-worker learning, participatory and group based approaches to communicating messages are increasingly recognised as effective in the delivery of farm advisory services. Pannell (2006) explains that these focus on learning and empowerment of message receivers. These approaches incorporate Kolb's experiential learning theory (Kolb and Kolb, 2005) which describes learning as an active process that relies on previous experiences and necessitates

learners to move between 'opposing modes of reflection and action and feeling and thinking' in order to learn. Despite the known effectiveness of these teaching methods, lecture-style presentations are still commonly used to deliver best practice messages and research findings at agricultural communication events in Ireland. Lecture-style presentations 'establishes a learning situation in which the agent is active but the learner is a passive participant required only to listen' (Verner and Dickinson, 1967). While Weinstein et al (1988, pp. 118) suggest that 'active listening is more effective than passive listening' when acquiring academic knowledge and skills.

There are many difficulties associated with delivering extension services. Feder, Willet and Zijp (2001, as cited in Anderson, 2007) recognised a set of connected and regularly encountered factors that affect the performance of agricultural extension systems. One of these is the 'problem of monitoring, evaluation and impact assessment'. Furthermore, Garforth et al. (2004) questioned the 'efficiency of the mechanisms in place for linking farmers with new knowledge and technology'. This study examines the learning of extension services' clients following an event they attended.

The review of the literature presented in the next section is followed by an explanation of the study methodology, then the study findings and a discussion of the findings are presented and concludes with practical recommendations for agricultural extension events and suggestions for future research.

2. Literature Review

This chapter reviews the associated literature clarifying the relevant concepts and identifying what previous research has revealed on the topic. It discusses the literature in the context of three main aspects, these are: role of extension services in agriculture; challenges in communication; and communication in extension services activities.

2.1. Role of extension services in agriculture

Agricultural advisors can also be referred to as 'agricultural extensionists' or 'agricultural consultants'. According to Anderson (2007) 'extension helps to reduce the differential between potential and actual yields in farmers' fields by accelerating technology transfer (i.e. reducing the technology gap) and helping farmers become better farm managers (i.e. reducing the management gap)'. Klerkx and Jansen (2010) state that the job of the advisor is frequently seen as being 'the expert who disseminates technical information and policy messages as part of the tradition of top-down agricultural extension'. Leeuwis and van den Ban (2013, p. 27) define the role of extentionists as 'undertaking a series of embedded communicative interventions that are meant, among others, to develop and/ or induce innovations which supposedly help or resolve (usually multi- actor) problematic situations'. Ward and Minton (1992, cited in Klerkx and Jansen (2010)) stated that 'farmers are conversely seen as being highly dependent on the advice of agricultural extension workers'. In response, Klerkx and Jansen (2010) suggest that 'training agronomists in communication skills should help them improve engagement with farmers and assist in their transition from expert to facilitator'. Leeuwis and van den Ban (2013, p. 27) in their definition explain that 'extension draws heavily on communication as a strategy for furthering aspirations...the emphasis on communication marks a shift away from a focus on education to a focus on learning'. Challenges to communication require further exploration given their importance.

2.2 Challenges to communication

Communication, as defined by DeVito (2006, p. 2), is an activity that 'occurs when one person (or more) sends and receives messages that are distorted by noise, occur within a context, have some effect and provide opportunity for feedback.' With communication consisting of the elements identified in Berlo's Model of Communications (1960) i.e. Sender-Message- Channel- Receiver (SMCR), a literature review undertaken by Lindsey (2003) identified barriers to communication as outlined below (Table 1).

Table 1: Barriers to Knowledge Sharing derived from Communications Research

Category	Study	Barriers
Sender	Golen & Boissoneau (1987)	status or position, poor organization of ideas
	Lewis (2000)	communicating goal achievements
Encoding	Bennett & Olney (1986)	poor communication skills
	Hulbert (1994), & Buckman (1998)	cultural differences
Channel	Westmeyer, DiCioccio, & Rubin (1998)	appropriateness and effectiveness of a channel
	Johlke, et al. (2000)	communication mode
Decoding	Golen & Boissoneau (1987)	differences in perceptions, emotional reactions, inability to understand nonverbal communication, prematurely jumping to conclusions, information overload, tendency not to listen
	Messmer (1998)	state of mind, preoccupation with an on-going task, passive listening
Reciever	Golen (1980)	communicators lack of credibility, hostile attitude
	Golen & Boissoneau (1987)	lack of understanding of technical language, personality conflicts, prejudice or bias, resistance to change, hostile attitude
	Golen, Catanach, & Moeckel (1997)	credibility/background, conflict
	Lewis (2000)	establishing legitimacy
Message	Johlke et al. (2000)	communication content, communication direction, communication frequency
Feedback	Golen & Boissoneau (1987), Messmer (1998)	improper feedback
	Lewis (2000)	sense making and feedback
Noise	Golen & Boissoneau (1987)	speaking too loudly, fear of distortion or

			omission of information, informal social groups or cliques, poor spatial arrangements, physical noise and distractions, use of profanity

Source: Adapted from Lindsey, 2003

Lindsey's review (Table 1) indicates many areas where messages can become distorted and causal interferences can occur at any stage in the communication process. For instance, the sender's status and position in society affects how message receivers respond to messages (Golen & Boissoneau, 1987, cited by Lindsey, 2003). When messages are being encoded poor communication skills (Bennett & Olney, 1986, cited by Lindsey, 2003) and cultural differences (Hulbert, 1994; Buckman, 1998 cited by Lindsey) between encoders and decoders can cause meanings of messages to be lost. Appropriate channels for the message being delivered must be used to ensure effective message delivery (Westmeyer, DiCioccio, and Rubin, 1998, cited by Lindsey 2003). Accurate decoding of messages occurs when receivers trust the message sender, are actively listening and have positive feelings towards the message sender. The complexity of message content also affects successfulness of message delivery (Golen & Boissoneau, 1987, cited by Lindsey, 2003). Feedback, if discerned correctly by the message sender, can allow messages to be decoded more accurately (Lewis, 2000, cited by Lindsey, 2003). According to DeVito (2006, p. 6) 'throughout the listening process, a listener gives a speaker feedback i.e. messages sent back to the speaker reacting to what is said'. Therefore, feedback provides speakers with the listeners' reactions. Feedback has also been called 'listener responses' or 'back- channel communications' by Yngve (1970) and incorporate the visual signs that audience members give to indicate their understanding without taking over the role of speaker.

Furthermore, noise affects how messages are interpreted. DeVito (2006, p. 10) suggests that there are four types of noise that affect communication, namely: physical, physiological, psychological and semantic. Physical noise is 'interference that… interferes with the physical

transmission of the signal or message' while physiological impediments are 'physical barriers within the speaker or listener'. Psychological obstructions are described as 'cognitive or mental interference' whereas semantic obstacles are the 'assignment of different meanings by speaker and listener.' Noise in DeVito's terms involves far more, therefore, than just audible factors. Many factors can distort meanings of messages and these are of relevance to communication at agricultural extension events.

2.3 Communication in agricultural extension activities

As noted above, agricultural extension widely uses lecture-style presentations in the delivery of messages to farmers and farm-workers. The obstacles to communication outlined above are particularly pertinent to this style of delivery.

Many lecture-style presentations suggest a linear communication model, where messages are delivered to receivers using a top- down extension approach. However, 'when we look at what came before such an event, and what follows, we often realise that the event is only one part of a total process in which information is exchanged between the two individuals' (Rogers, 1995 p. 6). At the time of a communication event, farmers may lack the confidence to ask questions or contribute their opinion especially events that use 'scientific jargon' (Reinjntes, Haverkort and Waters-Bayer, 1992; Millar and Curtis, 1997). In order to get a full picture of message transmission it is necessary to examine more than just the content of a lecture.

Lecture presentations at agricultural extension events often address innovations that are likely to be of use to the farmers and farm-workers in attendance. Since Ryan and Gross's pioneering study in 1943 of how agricultural innovations are adopted on farms, the adoption process has been extensively researched. This is because, as Pierce and Nowak (1999) noted, 'understanding the processes by which entrepreneurs become aware of and adopt new

technologies is of interest to the private sector, researchers, and policy makers' given that 'technology change is typically associated with enhanced opportunities for greater productivity and income'.

Roger's Model of the Diffusion of Innovations has five stages, namely: 'knowledge, persuasion, decision, implementation, and confirmation' (1995. p. 20). Knowledge occurs when an individual (or other decision-making unit) learns of the innovation's existence and gains some understanding of how it functions while persuasion occurs when an individual (or other decision making unit) engages in activities that lead to a choice to adopt or reject the innovation' (Rogers, 1995, p 20). Garforth et al (2004) explain that major limitations of studies examining the diffusion of innovations have been 'the implicit assumption that all decision making units in a given population will eventually adopt the innovation in question'. However some may not adopt the innovation, perhaps due to not gaining the required knowledge of it as a result of interference in the communication process.

Also, few studies exist that have examined the changed level of understanding that farmers and farm-workers have of innovations from attending events at which certain innovations were promoted. Benard and de Cock Buning (2013) completed research to 'investigate what elements affected joint learning between scientists and pig farmers' and found that 'during a symposium, farmers were only moderately open for scientific knowledge'. Due to the different perspectives that farmers and researchers have they found that 'the value of the message is decided on before the actual message is transmitted'. Once again, the credibility of the message sender is identified as a barrier to knowledge sharing, therefore. Benard and de Cock Buning (2013) also found that symposiums were 'inappropriate for mutual knowledge exchange'. The persuasion aspect of Rogers' model may not occur if attendees are not willing to engage with the innovative subject matter in the first instance.

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Learning impacts on the economic performance of farm businesses. The rewards that learning delivers are 'increased sustainable production, business profitability, jobs and sustainable rural communities' (Kilpatrick, 1997). Vanclay and Lawrence (1994) suggested that agricultural extension and education need to engage farmers in learning. They stated that 'extension agents considered farmers who failed to adopt new techniques to be recalcitrant and irrational' while farmers' attitudes and their lack of knowledge' were considered to be the main barriers to adoption. Little consideration was given to farmers' point of view. The idea that 'resistance or reluctance to change might have some logical basis was never considered' (Vanclay and Lawrence, 1994).

It appears from the review of the literature, therefore, that the learning that takes place at agricultural extension events occurs in the context of a complex and multi-facetted communication environment, and that the factors affecting such learning merit exploration in more detail. Hence the rationale of the current research study.

3. Methodology

This methodology chapter has three main sections discussing the research questions and approach, and the case study, the research instruments and limitations of the study.

3.1. Research questions and approach

Arising from the review of the literature undertaken, the following research questions were identified:

Are lecture-style presentations effective as a mechanism for linking farmers and farm-workers with new knowledge?

What are the challenges to effective communication at lecture-style presentations from the perspective of farmers/ farm-workers, message deliverer and observers?

At lecture-style presentations are mutual understandings between the speaker and the farmers/ farm employees achieved?

It was decided that the most appropriate research approach to explore these questions would involve a study of one agricultural extension presentation. This case study approach allowed a rich and in-depth examination of the factors that influence farmer learning in a particular context. While the findings from such a case study cannot be generalised in the traditional sense, they do allow for what Bassey (1999) described as 'fuzzy generalisability'. 'A fuzzy generalisation carries an element of uncertainty. It reports that something has happened in one place and it may also happen elsewhere. There is a possibility but no surety' (Bassey, 1999, p. 52). That is, the findings from the specific case may provide insights that are more widely applicable.

The methods used to collect data for this case study were: questionnaires completed by pig farmers and pig farm employees; written recorded observations of audience members; and a semi-structured interview with the speaker/presenter at an information dissemination event.

3.2. The case

This section has three sub sections addressing: the presentation event; the participants; and the presentation itself.

3.2.1. The event

The Teagasc Pig Research and Advisory Department organises two national pig research dissemination days (one in Cavan and one in Cork), that all pig farming clients are invited to attend. These presentations cover 'the broad array of research projects currently on-going in the Pig Development Department' (EUPIG, 2017). Three speakers from the event volunteered to have their presentations used for the purpose of this research and one of the three was randomly selected. The learning achieved by participants attending a selected presentation delivered at the Teagasc Pig Research Dissemination in the Paddy O'Keefe Centre in Moorepark, Co. Cork was assessed as the basis for this study.

3.2.2. The participants

The presentation was delivered to an audience of 120 pig farm owners, employees and others. The 'others' attending the event included researchers, agricultural advisors and those involved in agribusinesses. A total of 103 audience members completed the study questionnaire (Appendix 1) which was administered after the lecture presentation, of whom 19 were farmers and 16 were pig farm employees. Of these, one pig farm owner failed to complete Section 2 of the survey and so was not included in study. Thus leaving 18 pig farm

owners and 16 pig farm employees whose responses were analysed and are presented in this study.

3.2.3. The presentation

The presentation selected was entitled 'PathSurvPigs: Longitudinal study of respiratory disease on Irish pig farms'. The objective of the presentation was to make audience members aware of the PathSurvPigs Project main aims. These aims were: identifying current respiratory problems on Irish pig farms; reducing respiratory problems on Irish pig farms; and building diagnostic capacity on respiratory disease. The presentation also outlined practices that farmers and farm-workers could do to reduce incidences of respiratory disease on their farms. These practices included: keeping good pig health records so as to know health status on farms; use only one veterinary practitioner and discuss herd health with them; and discuss and compare data from one pig farm with other farms to improve health status. The centre where the presentation was delivered has a tiered conference room and seating for 120 attendees. A projector screen was located in the centre of the front wall which ensured visibility from all seats. The conference centre room was serviced with 6 audio speakers ensuring everyone could hear the speakers. The writing, graphs and images projected on the centre's screen was such they were clearly visible to all audience members.

3.3. The research instruments

Data for the study was collected using a mixed methods approach which included questionnaires with respondents, observations, and semi structured interviews. These instruments ensured a mixed methods approach that meant the study was as robust and rigorous as possible, and allowed for the triangulation of the data collected

3.3.1. Self-administered questionnaire

A self-administered questionnaire (Appendix A) was distributed to audience members after the speaker had delivered the presentation. It contained 3 sections, the first of which profiled the respondents in terms of gender, age, role on the farm, herd size (if applicable), and level of prior education attained.

The second section was compiled by the speaker and contained 6 multiple choice questions to measure respondents' level of comprehension from the presentation. The multiple choice question format was deemed most appropriate as it minimised the amount of writing that participants had to do, thereby increasing the chances that it would be fully completed. It also removed ambiguity from participant responses. The second section tested:

- Audience learning based on what the presenter had identified as important to understand during the presentation;
- Audience understanding of the recommendations that they could use on the farms with which they are involved;
- Audience understanding of the specific occurrences within the study (trial results and procedure followed) that were connected only to that study.

As the content of the presentation involved the dissemination of certain new research findings, it was deemed unlikely that respondents would have had much prior knowledge of the content tested in the questionnaire, and therefore the questionnaire did assess learning from the actual event itself. It was decided, in consultation with the presenter, that scores of above 50% would indicate that respondents had adequately understood key messages from the presentation while scores of beneath 50% would be indicative of failure to understand key messages delivered. A score of 83% and above (at least five out of six questions correctly answered) would be taken to indicate a 'very high' level of learning.

The third section of the questionnaire asked respondents to identify hindrances to their learning from the presentation, aids to their learning, and their self-evaluation of how much they believed they had learned from the presentation.

3.3.2. Observation

Audience members were watched by two observers throughout the presentation. These observers used an observation checklist (Appendix B) and were tasked with looking for behaviour indicative of engagement and non-engagement with the presentation. One observer was placed at the front of the room looking up into the audience and a second observer was placed at the back of the room facing the presentation.

3.3.3. Semi-structured interview

The speaker was interviewed the day after the presentation (see Appendix C). This was a semi-structured interview and asked the speaker about their own views on how effective they thought the presentation was.

These three data gathering instruments allowed the research questions to be fully explored and the results of this exploration are outlined in the next section.

3.4. Limitations of the study

Limitations of this study included a relatively small sample size and the relative complexity of the topic presented. Also, the findings from this research are based on only one presentation. Additionally, it is difficult to explore other factors, external to the presentation itself. For example, the questionnaire asked about prior educational experience, but in many cases participants actively read Farmer's Journal/attend similar events, while not actually

having a qualification. Also for non-intrusion reasons the survey didn't ask about health and

well-being but hearing difficulties and sleeping during presentation may be health related.

4. Results

This section presents the description of respondents, the measures of learning achieved by respondents, profile of the respondent, aids and barriers to learning, respondent's perceptions of their own learning, observations and speakers predictions of respondents learning.

4.1. Description of respondents

There were 120 attendees at the event and 103 respondents filled out the questionnaire. One questionnaire had to be discarded because it wasn't properly filled out. All attended the same presentation and all filled out the same questionnaire. The speaker was male and has experience of giving such talks. He is an expert in pig nutrition, micro-biota and immune system interactions.

4.2. Measure of learning achieved by respondents

The results achieved by farm owners and farm employees in Section Two of the questionnaire are shown in Table 2. As outlined in the methodology section, the questionnaire addressed general learning from the presentation, understanding of the presenter's recommendations, and recall of specific occurrences outlined during the presentation. These three aspects of the learning from the presentation are reflected in Table 2. Combined average mark denotes the mean result attained by farmers and farm employees from Section Two of the questionnaire.

Table 2: Distribution of farm owners (n=18) and employees (n=16) by correct responses achieved per question

	Question number	Owners Ave Mark (%) n=18	Employees Ave Mark (%) n=16	Combined Ave Mark (%) n=34
General learning	1	100	88	94
	4	77	38	53
Recommendations	2	88	100	94
	6	100	88	94
Specific occurrences within the study	3	44	75	53
	5	11	25	18

As is evident from Table 2, the best understood section of the presentation related to the recommendations given by the presenter, as the average score achieved on this aspect was 94%. In contrast, the least understood section was the specific details of the trial undertaken where an average score of only 36% was achieved.

Across the six questions asked, pig farm owners achieved an average score of 70% and pig farm employees achieved an average score of 69%. A chi-squared test was used to test for significance, the significance value of the test was P=0.9503. There was not a statistically significant difference between the results obtained by pig farm owners and pig farm employees therefore.

4.3. Profile of the Respondents

The next two sub-sections presents profiles of farm owners and farm-workers who participated in the study. It contains details of respondents' age, herd size, and education and results obtained in Section Two of the survey.

4.3.1. Farm Owners

A total of 18 farm owners are included. Exam percentages attained are compared to factors of age, education and herd size in order to determine if these influence understanding. The average overall result for farm owners from Section Two of the questionnaire was 70%.

4.3.1.1. Age

Pig farm owners in the study were on average 48 years of age. Table 3 below categorises farmers into three age groups and shows the average age and the average result from the Multiple Choice Questions achieved within this category.

Table 3: Combined Average Mark obtained by pig farm owners (n=18) when categorised by Age.

Farmer Age (years)	Average Age (years)	Combined Ave Mark (%)
Under 40 (n=6)	31	83
40-50 (n=6)	46	77
Over 50 (n=4)	59	58

When pig farm owners were categorised by age and their results to the six questions examined it indicated that as the age of farm owners increased the number of questions they answered correctly decreased. When tested for significance using chi squared test the study found that age was not a statistically significant factor in determining the number of questions answered correctly.

4.3.1.2. Education

An agricultural training course had been completed by 13 pig farm owners. Those that completed an agricultural training course received an average score of 77% in the exam while the farm owners (n=5) who had not completed an agricultural received an average score in the exam of 55%. When a chi-squared test was completed to test significance P=.3711 prior

education was not shown to be a statistically significant factor in influencing the number of questions correctly answered.

4.3.1.3. Farm size

The majority (60%) of farmer respondents had a pig herd of between 100 and 500 sows while 20% had between 501-1000 sows and 20% had over 1000 sows. This typifies pig farmers throughout the country where the average herd size in Ireland was 480 sows in 2016 (CSO, 2016). Table 4 presents details of farm size, the result owners with this farm size obtained, and the average age of pig farmers in these categories.

Table 4: Distribution of Pig Farmers (n=18) by Herd Size, Average Age, and Combined Average Mark.

Number of sows	Average age (years)	Combined Ave Mark (%)
101-500 (n= 10)	46	66
501-1000 (n= 4)	60	75
>1000 (n= 4)	40	75

Farm owners with more than 500 sows answered more questions correctly than those with less than 500 sows. When a chi-squared test for significance was completed P=.752 herd size was not shown to have a statistically significant correlation with the number of questions answered correctly.

4.3.2. Employees

This section presents data obtained from sixteen pig farm employees who partook in the study. The pig farm employees achieved an average score of 69%. Exam percentages attained are compared to factors age, education and herd size in order to determine if these influenced understanding.

4.3.2.1.Age

Pig farm employees in this study had an average age of 41 years. Table 5 groups farm employees based on age and detail the average age and average result from Multiple Choice Question within that category.

Table 5: Combined Average Mark obtained by pig farm employees (n=16) when categorised by age.

Age (years)	Average age (years)	Combined Ave Mark (%)
Under 40 (n= 6)	27	72
40-50 (n= 5)	45	55
Over 50 (n=5)	57	83

Table 5 above shows that increased age did not negatively affect scores attained in the Multiply Choice Question in the case of pig farm employees. This study found that in the case of the farm employee age was not a statistically significant factor in the number of questions answered correctly.

4.3.2.2.Education

Agricultural courses had been completed by 50% of respondent employees. The average age of those who had completed agricultural courses was 36 years and they received scores of on average 75% in the exam. The average age of those who had not completed agricultural courses was 47 years and the average result they received was 62%. Therefore, the respondents who had previously completed an agricultural course correctly answered more of the questions correctly than those who did not have an agricultural qualification. However, when the chi-squared test for significance was completed (P=.587), the association was found not to be statistically significant.

4.3.2.3.Farm Size

In this study pig farm employees most commonly worked on farms with over 1,000 sows. Table 6 compares the size of farms on which pig farm employees work with the combined average result they achieved in the exam and the average age of the employees.

Table 6: Distribution of Pig Farm Employees (n=16) by Herd Size, Average Age and Combined Average Mark.

Number of sows	Average age (years)	Combined Ave Mark (%)
101-500 (n=2)	33	66
501-1000 (n=2)	49	33
>1000 (n=12)	37	73

Employees on farms of 501-1000 sows and 101- 500 sows received average scores of 33% and 66% respectively. Those who worked on farms with over 1,000 sows received a result of 73%. Those employees who worked on larger scale operations answered more of the questions associated with the presentation correctly than those who worked on smaller farms. When compared to the average from each other group P values are as follows; 101-500 sows, P=.978; 500-1000 sows, P= .297; >1000 sows, P=.411. Therefore herd size was not associated with correctly answering questions by farm employees.

4.3.3.   Summary of farm owners and farm employees:

Table 7 below summarises the main findings as presented above for pig farm owners and pig farm employees.

Table 7: Main findings for pig farm owners (n=18) and pig farm employees (n=16)

	Pig farm owner	**Pig farm employee**	**Significant**
Ave Mark in Exam	70%	69%	
Ave Age	48 years	41 years	
Most common herd size	100-500 sows	Over 1000 sows	
Increased age = increased correct answers?	No	No	Not significant (P= .434)
Increased farm size = increased correct answers?	Yes	Yes	Not significant (P=.813)
Agricultural education = increased correct answers?	Yes	Yes	Not significance (P=.302)

Note: In 'Increased age= decreased exam result?' the average result from over 50 year old pig farm owners was tested against the average result from pig farm employees.

When testing 'increased farm size= increased exam result?' the results of those respondents who were involved in farms of greater than 500 sows (n=22) were tested against the results of respondents who had farms of less than 500 sows (n=12).

In 'Agricultural education= increased exam result?' those who had agricultural courses n=21 (both pig farmers and pig farm employees) had a combined average mark of 76%, those who had not completed an agricultural course n=13 (pig farmers and pig farm employees) had a combined average mark of 59%.

Pig farm owners and pig farm employees achieved similar levels of learning from the presentation studied at the Teagasc Pig Research Dissemination day. Of those audience members who were directly engaged in farming almost half of those in attendance were pig farmers and almost half were pig farm employees. Pig farmers in this study were on average 7 years older than pig farm employees and achieved a 1% higher average score for questions answered correctly. Therefore, the speaker successfully contributed to similar levels of knowledge for both farmers and employees. Farmers in attendance owned farms that were slightly smaller than those on which employees worked, this is not surprising as employment of workers is more likely to be on the bigger pig units. For both farmers and employees having a previous agricultural qualification increased understanding of content covered in the presentation but not by levels that were significantly significant. While none of the results

were statistically significant, which may be partially due to the small sample sizes, some of the trends suggested are of note and require further exploration.

4.4. Aids and barriers to learning

This section identifies the aids and barriers to learning from the perspective of farm owners, farm employees, the conference speaker and the two observers tasked with identifying behaviours that showed engagement and non-engagement with the presentation. Respondents' perspectives on barriers and aids to learning are discussed below in the context of participants who were deemed to have learned a lot from the presentation (greater than 83%), those who had average amounts of learning (50-83%) and those who had below average learning (below 50%). In each case the amount of times a particular barrier or aid was mentioned is noted.

4.4.1. Respondents who achieved more than 83%

The main barriers identified by the six farmers who received over 83% in the exam were inability to understand speaker (3 instances), pace of speech (2 instance), and a request that there be an available *'plug for phone so to tweet fantastic and interesting results'* (1 instance). The main aids identified were graphs (2 instances), clear take home messages (2 instances), '*anecdotes told by presenter'* (1 instance), and the Power-point presentation (1 instance).

Similarly, the main barriers to learning identified by the six farm employees who received over 83% were inability to understand speaker (3 instances) and '*speaker's accent*' (1 instance). The aids identified were 'graphs' (4 instance) with one respondent saying '*graphs state the point in the best possible way'*, slides containing take home messages (1 instance),

good presentation (1 instance), '*anecdotes*' (1 instance) and *'message sender'* (1 instance) (presumably good communication by the speaker).

For the respondents who achieved above 83% the most common barriers to learning were inability to understand speaker, pace of speaker's speech and speaker's accent. The most common aids to learning that this group acknowledged were graphs, take home messages and witty anecdotes.

4.4.2. Respondents who achieved 50-83%

The barriers identified by the eight farmers who received between 50-83% in the exam were interruptions (3 instances), difficulty of material covered (2 instance), inability to understand speaker (1 instance), inability to hear speaker (1 instance), and *'tiredness'* (1 instance). The main aids identified by these respondents were explanation of presentation (3 instances), *'interesting subject'* (1 instance) and '*clear Power-point presentation'*(1 instance).

The barriers to understanding identified by the eight farm employees who attained scores of between 50-83% were pace of speech of speaker (3 instances), complexity of topic (2 instances) and *'interruptions'* (1 instance). The aids identified were graphs (4 instance), quality of the venue (1 instance), '*written and spoken word'* (1 instance), *'good slides'* (1 instance) and *'interesting topic'* (1 instance).

For both farmers and farm employees who achieved between 50-83% in Section Two of the questionnaire the top barriers to learning that they identified were difficulty of the material covered, interruptions and pace of speech of the speaker. The aids this group identified were specific elements of the Power-point like graphs and good slides, as well as explanation of the presentation and interesting topic.

4.4.3. *Respondents who achieved less than 50%*

The four farmers who received less than 50% identified the following barriers to their learning; '*hearing*' (1 instance), '*distractions*' (1 instance), '*speed of delivery*' (1 instance) and finding subject matter '*very complicated*' (1 instance). This group failed to identify any aids to their learning.

The barriers to learning identified by the two respondents who got less than 50% in the exam were '*pace of speech*' (1 instance) and '*didn't want to ask questions in front of everyone*' (1 instance) . Those farm employees who got less than 50% didn't identify any aids to their learning.

For those farmers and farm employees who achieved less than 50% in the exam all of the barriers that they identified were mentioned by those who achieved higher grades bar one. This new barrier identified was not wanting to ask questions in front of the rest of the audience. Unlike their colleagues this group failed to identify any aids to their learning.

4.4.4. *Summary*

In summary then, there was a high degree of consistency between farmers and farm-workers in terms of what they identified as barriers and aids to learning. With inability to understand speaker, pace of speech, complex material and interruptions the most commonly noted barriers. Graphs, clear take home messages, power-point slides and anecdotes were regarded as the most commonly noted aids to learning. Interestingly, those who mentioned hearing as a barrier to their learning had an average age of 63 years. Therefore, this factor may be a physiological barrier that falls outside the remit of the speaker. Perhaps unsurprisingly, the barriers to learning appear to have affected individuals differently, with for instance, some respondents managing to overcome their difficulty with the speaker's pace of delivery with

little hindrance to their learning, whereas for others their learning seems to have been more negatively impacted upon. Likewise, it is notable that the respondents who scored most poorly on Section Two were unable to identify any aids to their learning, whereas respondents who scored better did identify aids to learning, despite all respondents having received the same input. This indicates the centrality of individual perspectives to learning.

4.5. Respondents' perceptions of their own learning

The farmers and employees were asked to identify how much information they felt they had understood from the presentation and this was compared to actual measured results obtained in Section Two of the questionnaire (Appendix A). This gives an insight into the respondents' evaluation of their own learning and their reflection on the barriers and aids to learning they experienced during the presentation.

Table 8 groups respondents based on the level (in percentage terms) they believed they understood from the presentation. Those who achieved an exam result within their predicted limit have been grouped together and their combined average result is displayed. Arguably these respondents had a good insight into their own learning during the presentation. Those who achieved below or above their predicted level also have their average combined and displayed. Although respondents were only surveyed on a sample of the material selected, their exam result is used as a proxy of overall learning from the presentation.

Table 8: Distribution of farm owners and farm employees by self-predicted results compared with actual result obtained in exam (n=34)

n	Self-Predicted % understood	Combined Ave Mark (%)
8	75-100	88
9	75-100	59
10	50-74	66
3	50-74	83
2	50-74	33
2	35-49	66

From Table 8 it can be observed that 53% of participants (n=18) accurately predicted how much they would understand from the presentation. 32% of participants (n=11) achieved results in the exam that indicated they understood less of the material covered than they had predicted they would. The remaining 15% of respondents (n=5) achieved scores that indicate they understood more of the material in the presentation than they thought they would. Therefore, 53% of farmers and farm employees had correctly estimated their own understanding of material covered in the presentation while the remaining 47% did not accurately estimate the amounts comprehended. Admittedly, the amounts they estimated they understood were not vastly different than the results they attained in general. However, this further indicates the complexity of learning and the many factors that influence learning at an event such as this, factors that may not be understood even by the learner themselves. For the purposes of the current study, having measured learning from the event allows for a more independent analysis of learning than that which is afforded if only looking at learning from the opinion of the message receiver.

4.6. Observations

The photographs below show the perspectives from which each of the observers viewed the presentation. In the opinion of the observers, the presentation took place in a comfortable room where the ventilation and temperature were appropriately controlled. They could see the Power-point presentation from all seats in the tiered conference room. There were multiple speech amplifiers in the room and both observers could hear the speaker comfortably throughout the presentation.

Fig 1: View of section of audience from back of room

Fig 2: View of speaker, presentation and section of audience from back of room

The observers did however note barriers to learning, as well as aids, during the presentation, and these broadly tally with the opinions of the respondents as gleaned from the questionnaires.

4.6.1. Barriers to learning noted by observers

From observing the participants, the following occurrences that inhibited learning were identified by the two observers: phone disturbances, both phones texting and ringing and an audience member exiting during presentation to answer phone; whispering; laughing; talking; audience appearing unable to hear speaker; participants exiting early and the conference room doors banging. Many respondents felt that the speaker spoke too fast and was therefore difficult to understand and said that this negatively impacted their learning – based on their experience of the presentation one observer felt that this was a reasonable opinion.

As well as physical noise, activities that suggested other types of noise, that is, activities that suggested participants were not engaged with learning were also noted. For instance these behaviours included people: using their phones surreptitiously, distracted chatting, napping and even on-line shopping. Some people were evidently not engaged – this sometimes affected others i.e. beeping of phone buttons creating an environment that was difficult to concentrate in. Additionally, it was observed that during parts of the presentation that had a high science content i.e. were relatively complex, the distracted activities appeared to be more prevalent.

4.6.2. Aids to learning noted by observers

In common with many of the respondents, the observers noted elements of the Power-point, and presentation such as speaker's anecdotes, graphs and simple language as being useful aids to learning. The speaker used many images, graphs and charts in his Power-point. This

kept the Power-point focussed and interesting. The speaker had slides that had clear take home messages that were very relevant to pig farmers and farm employees. The layout of the speaker's presentation was logical and coherent. The language the speaker used was clear and simple and suited to the audience to which he was delivering his message. His verbal presentation suited the Power- point presentation and he allowed time for audience members to ask questions.

Activities observed that shows engagement of the audience with the presentation were: photographing of the presentation slides; note-taking and adding notes to those in the proceedings booklet; positive body language including nodding at speaker and laughter at speaker's jokes.

For both barriers and aids to learning some of those identified are in the control of the speaker/event organiser and some are in the control of the participants.

4.7. Speaker's perception of audience learning

Following the communication event, the speaker was interviewed regarding his own impressions of the farmer and employee audience learning from the event. His opinions are conveyed in this section.

The speaker believed that 50% of participants *'at the most'* would understand 50-66% of the material covered and that just 10% of participants would understand more than 83% of the content. In fact, this study found that 77% of respondents achieved a score of greater than 50% and therefore understood more than 50% of the presentation, considerably more than the 60% predicted by the speaker.

The speaker's predictions were more accurate with regard to the specific scientific elements of the trial he presented to the respondents. He predicted that this would be least well

understood by participants (average score by participants was 36%), as he believed one *'needed a high level of scientific knowledge to understand serology'*. (Serology is the examination of blood serum and was used in the speaker's research study to identify pathogens in the respiratory system of pigs and how long pigs took to reach slaughter as a result of having these pathogens.)

The speaker felt that the majority of the audience would understand how the effect of diseases on pigs delays the time it takes them to reach slaughter. The question which examined this learning outcome received a correct response rate of 58%. The average correct response rate across all questions was 70% (range 11%-100%) for farm owners and 69% (range 25%-100%) for employees.

The speaker suggested that one of the aids to learning would be that the subject 'is very applied and their earning would be dependent on that'. None of the respondents noted this, but the recommendations section was the best answered, which bears out the accuracy of the speaker's opinion in this regard. He also stated he kept information relevant and scientific methods that would complicate the presentation were kept on a *'need to know basis'* and that he used a set of Power-Point slides that had images, graphs and text to keep the presentation interesting for the audience. Many respondents complimented these features of the presentation as an aid to their learning.

The speaker acknowledged that his own accent could be a barrier to learning as English was his second language and also that he speaks relatively quickly. These were barriers to learning that were identified by farmers, farm employees and the observers. The speaker commented also on how 'farmers and farm employees did not give much feedback with their body language as other audiences might.' He stated that he did not adapt the way he was going to deliver his message based on the body language of the audience.

In summary then, the speaker did not accurately predict levels of audience learning. He did however identify which sections would be least well understood and most understood by the audience. The speaker admitted that he did utilise non-verbal feedback from his audience and this combined with the poor prediction of audience understanding suggests that mutual understandings between the audience and the speaker were not achieved.

5. Discussion

This section discusses the effectiveness of the studied lecture presentation event in fulfilling the role of the extension services, it debates the challenges to communication that were uncovered and looks at the relationship between this communication event and the adoption process.

5.1. Role of the extensionist

The role of the agricultural extension activity is helping farmers to innovate. This study focused on the first two steps in the process of adoption of innovations, these being knowledge and persuasion (Rogers 1995). In the presentation studied, the speaker fulfilled the description provided by Klerkx and Jansen (2010) of agricultural advisors, in that he acted as 'the expert who disseminates technical information and policy messages as part of the tradition of top-down agricultural extension'. Since most of the respondents understood the recommendations for better practice provided in the presentation (see Table 2), the speaker can be said to have developed and/ or induced innovations that would assist farmers and farm-worker in solving problems in their daily work and so satisfies Leeuwis and van den Ban's (2013) understanding of an agricultural extensionist. However, as Table 2 also shows us, and if farmers are as Ward and Minton (1992, cited in Klerkx and Jansen (2010)) claim 'highly dependent on the advice of agricultural extensionists', then there is considerable scope for improvement in the efficacy of the lecture-style presentation studied. Many of the barriers, and indeed aids to learning, noted by the respondents in the previous chapter revolve around communication issues. Leeuwis and van den Ban's (2013, p. 27) emphasis on communication, and on the training of extensionists in communication skills, is certainly applicable in the context of the current study, therefore.

5.2. Challenges to communication in the presentation studied

Lindsey's 2003 model of 'Barriers to Knowledge Sharing' provides a useful framework through which to explore the barriers to communication found during the research. The elements discussed are sender, encoding, channel, decoding, receiver, message, feedback and noise.

5.2.1. Sender, Encoding and Channel

In the presentation studied, the message sender did not appear of himself to be a barrier to communication, as the farmers and farm-workers did not dispute his status or position, he was well-respected within the pig farming community and his ideas were well-organised and well-presented (Golen & Boissoneau (1987) cited by Lindsey (2003)). His encoding of the message did appear however to be affected by cultural differences (Hulbert (1994) and Buckman (1998) cited by Lindsey (2003)) as a number of respondents commented on his accent as being a reason why they did not understand the presentation. Similarly, many noted that he spoke very rapidly to the extent that some found him incoherent, which ties in with Bennett and Olney's (1986, cited by Lindsey (2003)) description of how poor communication skills can affect message encoding. The channel of communication used, notwithstanding the drawbacks of the lecture-style presentation, was effective and appropriate, as it was reasonable to expect that all respondents could see and hear the presentation comfortably (Westmeyer, DiCioccio and Rubin (1998) cited by Lindsey (2003)).

5.2.2. Decoding, receiver and message

As Table 2 shows, some respondents had difficulty decoding the messages of the presentation, whereas others did not. The meaning making that takes place during decoding is dependent on individual perceptions, aptitudes and prior experience. One striking example of

this was the tendency of some participants not to listen attentively (checking phones, whispering etc.) during the presentation, which was noted as a factor of communication by Golen and Boisoneau (1987, cited by Lindsey (2003)). This tendency may have been encouraged by the passive listening nature of the event, or by listeners' preoccupations with other tasks (Messmer (1998) cited by Lindsey (2003)).

Of the barriers to communication that are most closely associated with receivers, it would appear to be a lack of understanding of technical language (Golen and Boissoneau (1987) cited by Lindsey (2003)) that was most relevant to the presentation studied, as many respondents commented that the content was very difficult. This was proven by the poor result achieved by participants in the specific details of the trial section of the multiple choice examination. Other features of receivers acting as barriers to communication (hostility, resistance to change etc.) did not appear relevant for this study.

The individual nature of the learning that takes place at such events is exhibited by the different results obtained by the decoders when they were examined on the messages they received. Some participants achieved low scores whereas others achieved much higher scores, despite all being present for the same presentation. Achieving uniform high levels of understanding is an extremely difficult ideal to accomplish when disseminating complex material within the capacity of a lecture-style presentation and receiver-based factors may be outside of the speaker's control.

5.2.3. Feedback

Aside from the incidental feedback that may have been evident to the speaker during the presentation (e.g. people using phones, talking, or leaving room), the speaker received very little feedback from the group during the session. For instance, no questions were asked of him, despite time being allocated for participants to do so. It is well-recognised that in large

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groups attendees are less likely to ask questions than in small groups (Reinjntes, Haverkort and Waters-Bayer (1992); Millar and Curtis (1997)) which may be a factor here, and indeed interestingly, the speaker reported that farmers and farm employees asked him questions in person and by email after the event. While a lack of questions could be taken to represent disinterest by the audience, this was not borne out by the rather high scores achieved by some participants in the exam, and their relatively positive comments about the presentation afterwards. As noted in the previous chapter, the speaker was inaccurate in some of his predictions about how well participants would score on aspects of the content. Following the event he identified the issue of feedback from the audience being difficult to gauge. This may be a problem with all farming audiences or the speaker may need to seek training to become better equipped at identifying non-verbal feedback.

5.2.4. Noise

The delivery of the presentation used in this case study was affected by noise, most notably physical, physiological and psychological noise (DeVito, 2006). Due to time constraints section two of the questionnaire consisted of multiple choice type questions therefore it is not possible to ascertain whether semantic noise affected participants' interpretation of messages as the researcher did not have the opportunity to ask participants to write out and communicate their own understandings of messages.

Throughout the presentation physical noise occurred in many forms and this is evidenced in both the respondents' questionnaires and the observation records. Such noises included doors banging, phones beeping, whispering, distracted chatting and laughing. For the most part these incidences of noise were outside the control of the speaker. Event organisers could perhaps have ensured that the doors were attended, and more emphasis could have been

placed on participants switching off their phones, but ultimately given the adult-education nature of the event, such physical noises were in the remit of the message receivers to control.

In the study difficulties hearing the message sender were identified by some participants, but others did not report any difficulty and indeed both observers were able to hear him comfortably. For some respondents therefore, physiological issues (DeVito, 2006) presented barriers to communication and learning. Since the room was furnished with sound amplifiers, this may reflect the age profile of some members of the audience. As for most of the physical noise, physiological noise falls outside of the control of the speaker and venue organiser, once all reasonable accommodations are made. The use of the visual Power-point presentation should have ameliorated the effects of physiological barriers somewhat.

A section of the presentation included details on how the researcher had tested pigs for respiratory diseases. This presented very scientific and specialised information to the audience and though the speaker verified he had made every effort to simplify the information he presented, through use of images and graphs etc., some study participants still found the material presented technically challenging. Hence psychological obstructions (DeVito, 2006) did play a role in hindering some participants' learning, but not for all as some high scores illustrate.

5.3. Participant knowledge following agricultural extension activity

This study of a lecture-style presentation uncovered many barriers in the communication model that can cause messages to become distorted and meanings to be changed or lost. When all are examined it could appear that the odds are stacked against communication ever being efficacious. However, the results of this study's multiple choice question section suggests that despite all the barriers to knowledge sharing, effective communication can still occur.

The topic discussed in the studied presentation was of benefit to the farmers and farm-workers who were in attendance as adopting the recommendations suggested should decrease the time it takes pigs to reach slaughter thus increasing farm profitability and efficiency. It is notable that the recommendations were the best understood part of the presentation, and so it would appear that at least some of the audience were open to the persuasion described in Roger's (1995) model.

In keeping with Benard and de Cock Buning's (2013) finding that 'farmers were only moderately open for scientific knowledge', participants' learning in this study was weakest in relation to the specific scientific trial undertaken. Given that the recommendations relating to the innovation were well understood however, a lack of knowledge about the innovation should not provide a reason for non-adoption for many of them, although it is far too early to assess whether participants will actually adopt the innovation or not. The 'knowledge' aspect of Roger's (1995) model of innovation can be said to have been satisfied by the presentation therefore. Arguably the findings of this study provide some challenge to Benard and de Cock Buning's (2013) contention that symposiums are an inappropriate format for knowledge transfer, given that some learning did occur for participants in this case study.

The lecture-style presentation was effective to a degree and conclusions and recommendations as to how communication might be maximised within the context of that presentation style are discussed in the next chapter.

6. Conclusion and Recommendations

This case study explored effectiveness of one lecture-style presentation in delivering best practise messages to farmers and farm employees, the challenges to effective communication from the perspective of farmers and farm employees, observers and the message sender and questioned whether mutual understandings were achieved between the study participants and speaker. Obviously, given the small sample size of the study, further research is required if the effectiveness of lecture-style presentations in general is to be evaluated. However, in light of Bassey's (1999) concept of 'fuzzy generalisability' it seems likely that recommendations gleaned from this specific context would have relevance in similar contexts.

Each of the research questions is considered briefly below in light of the conclusions drawn from the research, with accompanying recommendations.

6.1. Are lecture-style presentations effective as a mechanism for linking farmers and farm-workers with new knowledge?

The study findings suggest that the lecture-style presentation was effective for learning for some participants, but not so for others.

As noted in the previous chapter, in some instances the communication difficulties associated with the lecture-style presentation rested with the message receivers, and so would be difficult for the message sender to overcome. However, to some extent it may have been possible to 'prime' the message receivers to be more open to the knowledge presented, perhaps by incorporating interactive activities that reduced the passive listening required of them, and by minimising distractions by, for example, strongly encouraging people to put their phones away. The witty anecdotes that were praised by some respondents might also serve a similar purpose.

Conversely, some of the barriers to communication found in the study, particularly related to physical noise, would have been easy for the organisers to ameliorate, e.g. by ensuring that the conference room doors were attended so they would not bang noisily. Careful consideration needs to be given to the scheduling of tea-breaks etc. during symposium style events, so that participants have adequate opportunity to talk to each other outside of the conference room, and that they are only expected to concentrate for limited periods of time. Given the usual working day of farmers and farm-workers, the challenges of lecture-style presentations may be of more relevance to them than non-agricultural audiences.

6.2. What are the challenges to effective communication at lecture-style presentations from the perspective of farmers/ farm-workers, message deliverer and observers?

6.2.1. *Over-reliance on auditory learning*

Lectures, by their nature, present information verbally in the main. For some respondents this was a challenge. Many of the participants acknowledged the importance of the visual aids (graphs, tables etc. on Power-point presentation) provided by the speaker as an aid to their learning.

It is recommended, that as the speaker did in this case, the crucial importance of visual aids to support verbal presentations be recognised. Visual presentations need to be compiled with care, ensuring that adequate information is displayed on them, without being so text heavy that they discourage participants' engagement with them. As noted in the previous chapter, the issue of physiological interference to communication is one that agricultural extentionists would be hard pressed to overcome. The use of good visual aids allows them to provide reasonable accommodations to people with hearing difficulties etc.

6.2.2. Message-sender's presentation skills

It was found that some respondents' learning was hampered by the pace of speech and unfamiliar intonation of the presenter, although this did not create difficulties for others. Conversely, the layout of his presentation was widely praised. Some participants had heard him speak before, which may partially explain these differing perceptions.

Admittedly the nervousness of the presenter may have been increased by his awareness that the presentation was being used as the basis for this study, and this may have had an effect on his pace of speech. His accent may have also have had an effect on the participants' perceptions of his pace of speech. In this instance, the Power-point presentation was clear and concise, but this is not always the case at such events. It would seem sensible that all agricultural extensionists receive specific training in how to present lecture-style educational events, as there are specific skills required to do so effectively. Such training should focus on reducing communication barriers in relation to message senders, encoding and channel, as these aspects of the communication process are in the direct control of the presenter.

6.2.3. Challenges of complex scientific language

The part of the presentation addressing a specific scientific trial was the least well understood by participants. Complexity of scientific knowledge is a major barrier in the communication process.

Farmers and farm-workers need to be encouraged not to 'switch off' for the complex science part of presentations, perhaps by ensuring that the material is broken down to be as understandable as possible, through the use of visual support materials, and through making links between scientific knowledge and practical recommendations. Flagging a part of the presentation as complex may be counter-productive if it causes participants to lose interest

for that part. The placement of complex language in the presentation also needs careful thought – too early and the participants may be put off the entire presentation, but too late and they may not have the background context through which to understand it.

6.3. At lecture-style presentations are mutual understandings between the speaker and the farmers/ farm employees achieved?

It can be argued that mutual understandings were achieved between the speaker and those participants who achieved high scores on Section Two of the questionnaire. However, mutual understandings were not as well achieved with other participants. Interestingly the speaker was not fully aware of where mutual understandings had or had not been achieved, due to the limited feedback he received from the audience. Were it not for the current study, no-one would really be able to state what was learned from the event, and by whom.

It seems crucial therefore that assessment for future learning take place at such events. One obvious way of achieving this is the use of feedback sheets at the end of the event. These are not without limitations however, as the inaccurate predictions participants made about their own learning on Section Three of the questionnaire demonstrate. Such feedback sheets would need to be supplemented by an actual assessment of learning, such as the Multiple Choice Questionnaire. While there might be audience resistance to the notion of an 'exam' after the event, such assessments could be built into the presentation and might also have the effect of reducing audience passivity.

Despite the limited verbal feedback, participants did provide the speaker with non-verbal feedback during the presentation (e.g. note-taking, laughter at anecdotes, leaving room, falling asleep). It would seem important that presenters become more attuned to such feedback, and use it to tailor their presentation to the specific requirements of the audience. Such actions might allow for the better creation of mutual understandings.

6.4. Implications for future research

Given their many benefits in terms of convenience, affordability and reach, lecture-style education events are much used in agricultural extension activities in Ireland, and it seems likely that this will continue. It is of great importance therefore that the messages communicated at these style events are received clearly and accurately by the farmers and farm-workers in attendance.

The current study looked in a relatively limited scale at how the effectiveness of such lecture-style presentations may be hindered by barriers to communication. There is obviously much scope, and much need, for further study in the area. For instance, this study could be up-scaled to explore challenges to communication across a range of presentations, and to a far wider and larger audience. Other agricultural sectors could also be included. By its nature this study was constrained in the factors it explored. Some other factors that might have relevance have been flagged above, e.g. the health conditions of the farmer/farm-worker participants or their familiarly with scientific concepts in general. A follow-up study, exploring how many of the participants actually implemented the recommendations from the event on their own farms would also be insightful.

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Appendix A: Survey

Survey on farmer understanding of advisory messages

Dear Conference Attendee,

I am a Walsh Fellow student completing a Masters in Agricultural Extension and Innovation with Teagasc and UCD. My project will examine farmer interpretation/ understanding of advisory messages. The responses to this survey will be used in the development of my thesis. This survey has 3 sections and I would be very grateful if you could fill in all sections of the survey.

All responses are private and confidential and no effort will be made to identify respondents. I appreciate the time you have taken to fill in this survey and thank you for your contribution to my thesis. If you have any queries regarding this thesis you can talk to me here today or contact me at Bernadette.bennett@teagasc.ie

Thanks again and safe home,

Bernadette

Section 1 – This section contains 6 questions about you and your farming activities.

1) What gender are you? (Circle most appropriate response)
Male
Female

2) What age are you? _____

3) What is your role on the farm? (Circle most appropriate answer)
Farm Owner
Farm Employee
Spouse of farmer
Other (Please explain) _____ (such as farmer's accountant, Ag advisor, etc.)

4) In addition to pig farming please select if you have any other farm enterprise(s) (Circle most appropriate answer)
Dairy
Tillage
Forestry
Other (Please State) _____

5) What is your herd size (Circle most appropriate answer)?
< 100 sows
101 - 500 sows
501 - 1,000 sows
> 1,000 sows

6) What is the highest level of education you have attained (Circle most appropriate answer)
Finished primary school
Completed junior cert
Completed leaving cert
Completed agricultural course
Other qualification (please explain) _____

Section 2 – This section examines learning from Edgar Garcia Manzanilla's presentation on project PathSurvPigs.

Please circle the answer that you feel is the most correct response

1) **The main objective of project PathSurvPigs is to better understand respiratory disease in Irish pig farms and to develop diagnostic capacity in Ireland.**
   o True
   o False
   o Not sure

2) **Edgar recommends the use of how many veterinary practitioners?**
   o 1 vet
   o 2 vets
   o 3 vets
   o None of the above
   o Not sure

3) **In project PathsurvPigs pigs from 'Farm A' and 'Farm C' (those farms that slaughters pigs at 23 weeks) have antibodies APP from their mother?**
   o True
   o False
   o Not sure

4) **In this study pigs with no or low levels of antibodies PRRS performed better/ were slaughtered quicker than those with high levels of antibody PRRS.**
   o True
   o False
   o Not sure

5) **In this trial pigs are tagged so to**
   o Ensure correct breeding protocols
   o Tell what infections are related to clinical lesions
   o Identify at what age they are slaughtered
   o None of the above
   o Not sure

6) **Comparing data between farms will help you to improve the health status on your farm**
   o True
   o False
   o Not sure

Section 3- This section asks you details about your learning experiences from Edgar's 2nd presentation on Project PathSurvPigs .

1) **What hindered your learning?**
   Please state what hindered your learning and explain the main reason behind your response. Hindrances may include location, presentation (graphs, written word, and take home messages), noise/ interruption, inability to hear speaker etc.

   _____
   _____
   _____
   _____
   _____

2) **What aided your learning?**
   Please state what aided your learning and explain the main reason behind your response. Learning aids may include location, presentation (graphs, written word, and take home messages), the message sender, questions, discussion etc.)

   _____
   _____
   _____
   _____
   _____

3) **How much of the information do you think you understood from todays' presentation? (Circle most appropriate response)**
   Understood 75 -100%
   Understood 50-74%
   Understood 35-49%
   Understood less than 34%

   Any other comments

   _____
   _____
   _____
   _____
   _____
   _____

Thank you for your contribution to my study.

Appendix B: Observation Record

Observation record:

Tick if you observe these behaviours/occurrences while speaker is delivering messages:

Activities observed that can inhibit learning

Activity	Tick	Comment
Phone disturbances		
Whispering/ laughing/ talking		
Audience unable to hear		
Participants exiting early		
Inclement weather		
Other comments		

Activities observed that show engagement with the material being explained

Activity	Tick	Comment
Farmers photographing board		
Note- taking		
Question asking		
Positive body language		
Other		

Appendix C: Semi- Structured interview Questions

Questions with speaker

What part of your presentation went well?

What part didn't go well?

What would you change?

Did you feel your audience were engaged with the topic? What made you think this?

Did you feel the questions that were asked at the end of your presentation showed that the audience engaged with the topic?

What do you think aided the audiences learning at your presentation?

What do you think hindered the learning for the audience at your presentation?

What percentage of participants do you think understood 50-75% of the material covered?

What percentage of participants do you think understood 75% + of material covered?