

Is the use of video conferencing and supporting technologies a feasible and viable way to woo farmers back into farmer education?

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North Dakota State University (USA) have been using video conferencing as a delivery mode for farmer education for about twenty years and report that their farmers find this delivery method both practical and worthwhile. With the number of New Zealand farmers attending learning events decreasing, due mainly to time and cost, maybe it is time to use different approaches to engage farmers in learning. A study called 'FeedSmart', which looked into the ways farmers preferred to learn, identified that e-learning is worth further investigation as a learning delivery approach. In this paper we report on three small-scale trials that investigated the viability and effectiveness of generating and delivering information to farmers via a video-conferencing-based learning approach. This study showed that e-learning of this type has potential as a learning approach for farmers and is worthy of further investigation.

Introduction

North Dakota State University (USA) have been using video conferencing as a delivery mode for farmer education for about twenty years and report that their farmers find this delivery method both practical and worthwhile. With the number of New Zealand farmers attending learning events decreasing, due mainly to time and cost, maybe it is time to use different approaches to engage farmers in learning. Therefore, this study investigated the question: is video conferencing, supported by other technologies, a feasible and viable learning approach for members of the New Zealand farming community?

New Zealand providers of farmer education are currently finding it difficult to attract farmers to learning events. Anecdotal information from farmers and findings from a recent large (845 respondents) survey on farmer learning needs (MacKay & Bewsell, 2010), indicate that, while there is a plethora of learning events offered to farmers, few of these actually meet farmer-identified needs. Farmers report that they want to attend learning events that have direct relevance and application to their own needs, contexts and particular farming issues. They also report that they prefer to learn with and from other farmers.

FeedSmart, a Meat & Wool New Zealand and Foundation for Research, Science and Technology (FRST) funded research program, was charged with identifying the most effective learning approaches to use to assist farmers across New Zealand to learn to feed plan more effectively. Initial research directed the development of a series of five different face-to-face workshop styles for delivery to a range of targeted audiences. During the course of this study to identify farmer learning needs and preferences with regards to feed planning, e-learning was identified as a possible delivery mechanism that that farmers might be interested in using and therefore worthy of further investigation.

This finding led to exploration of possible e-learning delivery modes that would cater for the farmers' identified learning preferences for small-group, social, interactive and hands-on learning that is related directly to the farmers' levels of knowledge and expertise, interests and their own farming systems and local context. To this end, video conferencing was identified as a technology that had the potential to deliver the type of social learning program the farmers reported they preferred. At the time of this work (2006), the New Zealand Ministry of Education was promoting and co-funding the installation of video-conferencing facilities into many of our high schools, and in particular into rural high schools. This assistance came with the proviso that, whilst the facilities were primarily for classroom teaching and learning, the facilities were also to be made available to interested community groups. The research team made an application and were successful in gaining agreement from the Ministry of Education to approach schools to request permission to use their video-conferencing facilities throughout the country.

To prepare for using video conferencing as a learning delivery mode for farmer groups, Margaret Brown, the leader of the FeedSmart project, spent time at North Dakota State University (USA) learning about and being part of interactive video-conferencing farmer learning sessions. Thus, the stage was set for the design and delivery of the FeedSmart e-learning trials.

The FeedSmart e-learning trials

The purpose of the FeedSmart e-learning trials was threefold. We wished to:

- investigate the viability and feasibility of using e-learning as a learning approach for members of the agricultural community
- investigate whether it was possible to translate an interactive, participatory, face-to-face workshop format into a distance format based on video conferencing supported by other technologies, and

- investigate the use of different technologies to support and enrich the video-conferencing learning sessions.

It should be noted that these trials were conceived of as a scoping, exploratory study to investigate whether carrying out a larger, more robust study was warranted. To this end, we planned only one trial originally, evaluated that, explored technological difficulties and then planned the next trial with the lessons learnt. To date we have carried out three FeedSmart e-learning trials. Each trial has consisted of groups of eight to ten farmers travelling to their local high school for three or four 2-hour sessions, held at approximately three-week intervals. The farmer groups using the VC equipment in the schools have been connected to a feed planning specialist at another location.

According to Garrison and Anderson (2003), e-learning should always be directed by well-defined pedagogy that gives direction to the technology rather than the other way around. To this end, we took the content and design of the face-to-face FeedSmart workshops, which had been carefully designed on adult learning principles, and adapted these structures and activities into a series of interactive discussions and hands-on tasks. The farmers played a large role in deciding the direction, content, form and pace of their learning. Because of the trial nature of this project, a parallel program of summative and formative review was built into the program.

Trial findings and discussion

The trial findings and discussion are presented in the following five sections:

1. Design of interactive video-conferencing sessions
2. Farmer participation, enjoyment and learning
3. Use of video-conferencing technology and supporting technologies
4. Presenter challenges

5. Value and feasibility of the video-conferencing-based delivery approach.

1 Design of interactive video-conferencing sessions

As stated above, the video-conferencing sessions were based on the format and content of the face-to-face FeedSmart workshops, which were founded on identified learner readiness, recognition of learner prior knowledge, expertise, farming context and system, and farmer interests (Knowles, Horton & Swanson, 2005). The workshops had also been carefully constructed to provide a balance of information presentation, discussion and hands-on tasks (Ota, DiCarlo, Burts, Laird & Gioe, 2006). The challenge for the program designers was to translate these activities into a design suitable for the distance video-conferencing environment. At the video-conferencing sessions, this was achieved through the use of PowerPoint presentations, whiteboards, breakout discussions and use of the document camera.

As with the face-to-face workshops, we found it necessary to vary the presentation of information sessions with discussion sessions to maintain high levels of involvement and engagement. We found that two forms of discussion worked well. The first form involved the facilitator, at another location, being either an active member of the discussion or just an observer of the discussion that was self-led by the farmer group. We also found that giving the farmer group a discussion activity that they had to self-lead while the facilitator was totally turned off and not contactable for 10–20 minutes worked particularly well.

We used the document camera to recreate the workshop interactive activities such as sorting grass matter that had been brought in by the farmers. The hands-on tasks, which at the face-to-face workshops had been carried out in a nearby paddock, were recreated by having the farmers carry out tasks between sessions. This involved taking photos and videos of themselves carrying out prescribed tasks on their farms

(e.g. taking pasture measurements and samples). These photos and videos were brought into the next video-conferencing session and streamed back to the facilitator for comment and discussion.

It had been our intention to introduce the farmer groups to the use of Moodle (an electronic data storage and communication tool) as a way to share and store information, but to date we have not done this in any of the trials. This is because the facilitator has struggled with the IT challenges and felt that he was not ready for an additional challenge. It is still our intention to assess the readiness of both the presenter and the farmers to use this learning support technology in our next trials.

We are also now looking at the possibility of offering farmer groups the option of using webinars in between video-conferencing sessions. We envisage farmers, either individually or in twos or threes, connecting to the webinars from their home computers. Use of webinars will both reduce farmer time off farm and also further enhance the blended type of learning approach we are seeking.

2 Farmer participation, enjoyment and learning

The farmers entered the project with a high level of excitement and interest in both the FeedSmart content and the use of the technologies. This high level of interest could be attributable to the novel nature of this trial and the fact that these farmers were the first to be involved in a trial of this nature in New Zealand. This excitement and interest translated into a sustained high level of participation and interaction over the length of the trial. The farmers reported that this level of participation and interest was created and sustained primarily through the small size of the group (8), which enabled them to contribute, ask the questions they wanted answers for, and set the direction of the sessions to cover the topics they each wanted to know more about. The farmers also reported that having the course content tailored to their own needs, expertise, context and

issues greatly enhanced their learning level and enjoyment of the course. They also stated that the shorter, repeated sessions (the face-to-face workshops had been one-off events of 3.5 hours) had allowed them to reflect more on their learning, try suggested actions and then to come back and discuss and share their findings and/or queries, which the usual one-off workshop does not allow. The farmers said they particularly enjoyed the interaction with the presenter, even though he felt at times he was not engaging particularly well with them. The farmers also reported that the homework tasks, like the pasture measurement and analysis exercises with the video cameras in between the video-conferencing sessions, kept up and added to the interest of the program without being onerous. All of the farmers reported that they would like to be part of another e-learning course of this nature so that they could try other new technologies.

3 Use of technologies

The use of the video-conferencing system presented us with a number of challenges, namely problems with passwords, compatibility and connections between the Ministry of Education and AgResearch's video-conferencing systems, and access to HELP facilities outside of the Ministry of Education's work hours. These difficulties showed us that, while we had hoped that it might be possible to build up farmer and eventually farming community capacity to use the video-conferencing equipment and support technologies like document cameras, it appears that at least for the first trials, if not all trials, it is going to be necessary to have IT expertise on hand at each site. This is necessary not only to train the farmers in use of the equipment but also to attend to such things as connection difficulties and sight and sound problems as they arise.

4 Presenter challenges

The FeedSmart scientist presenter/facilitator was a very experienced and highly regarded presenter of face-to-face workshops, having presented a large number of the FeedSmart face-to-face workshops.

However, he experienced a number of challenges with this new style of delivery. In particular, he felt that, as he could not read the body language of his 'class', he was not able to engage and interact with them fully. As noted above, the farmers did not feel this way about the interaction he had had with them. The presenter also felt hampered by not being able to move around as much as he would have in a face-to-face workshop. These challenges highlighted the point that e-learning via video conferencing requires a different presenter approach which is based on more frequent direct questioning and individual and group tasks than is necessary in a face-to-face environment to maintain interest and engagement. It appears that input from the presenter needs to be interspersed with frequent group questioning, responses and interactions approximately every five to ten minutes to maintain full audience engagement throughout a one-and-a-half hour session.

The trials also showed that, to enable the presenter to move freely from the computer to document camera to whiteboard or smartboard, it is preferable to have a technician present who can train the video-conferencing camera on the presenter and so free them up to move unhindered and more naturally between the pieces of equipment. These trials also illustrated the importance of presenter training even if the presenters are already very experienced face-to-face presenters. While the FeedSmart presenter received this training from the Ministry of Education, AgResearch is looking to train more video-conferencing presenters who in turn will be able to build industry personnel capacity if e-learning based on video conferencing becomes a widely used learning approach for members of the agricultural community.

5 Value and feasibility of the video-conferencing-based delivery approach

The results of the formative and summative evaluation of the trials showed that all members of the farmer groups found the trials interesting and of high value as they had increased their knowledge

of feed planning and, in particular, gained answers to their own feed planning issues. As one farmer said, 'I have learnt more about feed planning from this than any of the other things I have been to.' Another farmer commented: 'The best part has been getting Tom to answer my questions about my place ... not just general stuff, my place.'

All farmers reported that they would like to be involved in further learning events that are based on the use of these e-learning technologies. They also reported that the event had been made more valuable to them because we had listened to, and delivered on, all their identified preferences for small groups, travel distance, length of session, and flexibility around days and times of sessions.

Despite the challenges the presenter experienced, he still sees value in the video-conference-based delivery approach. He has made the point that it is important that we commence training other presenters in this style of delivery if we wish to grow this form of technology transfer as it is not easy to move straight from being a face-to-face workshop presenter to presenting via video conferencing.

With regards to the feasibility of this delivery approach from a commercial point of view, we need to investigate the full cost of this approach to both the farmer and the service provider. We also need to look at ongoing access to the Ministry of Education's video-conferencing facilities and the schools that own these and we also need to investigate the ongoing cost of this service. While this approach is going to be feasible for farmers who live within thirty to forty minutes of schools with video-conferencing equipment, it is not going to reach farmers who live in more remote areas. However, it is possible that in the future, with better internet connections, webcams and technologies like SKYPE and webinars, it might be feasible to translate the video-conferencing sessions into interconnected, blended SKYPE/webinar sessions for the remote farmers.

Conclusions

For the farmer participants and from our position as designers and deliverers of the total FeedSmart learning package, these trials have been both successful and valuable as they have identified several important findings about the design and delivery of e-learning programs. Firstly, they have demonstrated that it is possible to design and deliver e-learning programs that truly reflect the adult learning principles of student-centred, participatory, interactive, small-group learning based on goals and expectations that are both important to and set by the learners. Secondly, they have demonstrated that it is possible to translate the hands-on content of face-to-face workshops into distance formats using such technologies as document cameras, video cameras and digital cameras. We also see potential to enrich future e-learning programs with the use of other technologies such as smartboards, webinars and computer-based course management systems (e.g. Moodle) to handle course information and facilitate participant engagement and interaction between sessions.

These three trials have also demonstrated that e-learning based on video conferencing supported by other technologies such as document cameras and flip-videos can successfully deliver an interactive learning program that caters directly for farmer learning style preferences and farmers' need for learning to be social and tailored to their own interests, experience, context, and farming systems and issues.

To continue our research about the use of video-based learning supported by other technologies, it is our intention to build on the findings of these trials. We are in the process of planning a fourth trial, which will involve connecting two groups of farmers with the presenter to facilitate three-way sharing and generation of new information. We are also planning a fifth trial, which will involve joining two or three groups of women farmers together with one or two presenters.

Throughout further trials we intend to look for ways to enhance and build community IT capacity within the groups we work with. It is our aim to leave each group with a set of skills that will allow them not only to engage in future e-learning opportunities to build up their farming knowledge, but hopefully will add to the set of IT skills they use in other aspects of their lives and businesses. Building on what we have learnt and the success of the three FeedSmart trials, we have commenced using this video-conferencing-based learning approach with other groups of farmers who are learning about climate change and greenhouse gas emissions.

In conclusion, the findings of these three trials have demonstrated that e-learning based on video conferencing and the use of supporting technologies appears to be a viable alternative to face-to-face workshops for generating and sharing information within the New Zealand agricultural community and it may in time woo some farmers back into learning programs.

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