

////Title: Exploring the Potential of Mobile Learning for Farmers in Remote Regions

////Standfirst:

Despite advances in agricultural science, communicating best practices to farmers in remote areas remains difficult. Although mobile learning tools, such as animated videos, have the potential to effectively present new information to diverse, isolated audiences, their long-term efficacy is poorly understood. A team of researchers from the Agricultural Research Institute of Mozambique, Michigan State University and Iowa State University followed up with farmers in Mozambique two years after receiving video-based, mobile instruction. Their findings suggest these methods are just as successful as in-person teaching styles in improving farmers' ability to retain and use new information.

////Main text:

In adult education, many researchers and educators are beginning to recognise the potential of 'information and communication technologies' – known as 'ICTs' – in transferring knowledge to a wide audience in a cheap yet highly effective way.

Though students are receptive to ICT tools, such as video animations and presentations that can be readily viewed on smartphones, we have relatively little information on whether these new teaching methods help students adopt and routinely use new information and practices in the long term.

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The issue of transferring knowledge to remote, isolated areas, is particularly relevant in agriculture. In many parts of the world, there are limited opportunities for traditional, in-person training or workshops designed to teach new agricultural methods to farmers.

In Mozambique, for example, agriculture makes up a large part of the country's economy, yet smallholder farmers in isolated communities produce most of the crops. These same farmers are under increasing pressure to adapt to threats posed by climate change, the lingering effects of Mozambique's civil war, and land policy changes.

Traditionally, newly developed techniques that can help farmers combat these issues are communicated via in-person instruction. However, geographic, cultural and language differences pose barriers to in-person learning, particularly for farmers who live in remote regions.

New teaching methods that leverage technology based on remote learning have the potential to make critical farming information more readily available to isolated farmers. However, whether these methods are as effective as in-person instruction in the long-term, remains an open question.

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In a paper recently published in *Information Technology for Development*, researchers from the Agricultural Research Institute of Mozambique, Michigan State University and Iowa State University returned to farmers in Mozambique who had received video-based training, in-person training or a

combination of the two. Two years after the farmers had received training, the research team assessed how well they grasped the information, and surveyed them on whether they had adopted the methods outlined in the training.

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This research was a follow-up to a previous study carried out in 2015, in which 314 farmers in 10 communities in northern Mozambique were taught about a novel method for storing beans called the 'jerrycan' method.

The farmers were randomly assigned to one of four experimental groups. One group, known as the 'mobile' group, received only animated video content, which had appealing imagery and audio dubbing in the farmers' native language. A second group received traditional instruction via in-person lectures and demonstrations. The third and fourth groups were exposed to both delivery types, with one group receiving traditional instruction followed by mobile training, and the other receiving mobile training followed by traditional instruction.

At the end of the original study, the farmers were tested on the benefits and the preparation of the jerrycan method. Although all four groups showed significant improvement, the group that had received only traditional instruction scored significantly lower on the test than students who received one of the other three delivery methods.

This initial research suggests that mobile learning alone, or in conjunction with traditional instruction, resulted in greater knowledge retention. In a test that assessed actual knowledge transfer – measured by the ability of the students to prepare the jerrycan method – all approaches resulted in significant learning gains by the students, with no one method yielding higher improvement.

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In 2017, two years after the first study, 104 of the original participants were given the same tests, without any refresher training. The farmers were asked to recall the original steps for storing beans and were also asked whether they described or demonstrated the technique to other farmers.

The researchers then analysed the farmers' test results based on their learning group from 2015, to see if a particular method – traditional, mobile, or a combination of the two – yielded longer-term knowledge retention and usage rates.

Among the farmers surveyed, 89% reported they had used the jerrycan method more than once – a strong sign of adoption. Additionally, 92% of the farmers reported telling around eight farmers, on average, about the technique, suggesting potential wide-spread usage.

Although the original study in 2015 showed that traditional teaching was significantly less effective than mobile methods, this difference was not detected in this two-year follow up study. In fact, when re-tested, participants from all learning types showed significant improvements in the test scores, with no differences based on the initial instruction method.

These results suggest that over the long-term, mobile training, delivered via animated videos, is at least equally as effective as traditional instruction in improving farmers' knowledge and their adoption of new techniques.

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This is one of the only long-term follow-up studies assessing whether the effects of new remote-teaching methods wane over the years following the initial instruction. The authors argue that mobile training is a valuable tool that should be further explored in adult education.

As the researchers also found no differences in knowledge retention and method adoption based on education level, gender, or farm output, animated videos have the potential to benefit a diverse audience and improve the livelihoods of farmers worldwide. Mobile learning gives educators another tool to use, either alone or in conjunction with traditional methods, drastically improving their ability to successfully deliver critical information in a cost-effective way to thousands of communities.

What does this mean for the international development community? This research supports the concept that animations, placed into local languages, can be used to scale educational content in a highly cost-effective manner with the net result of changing behaviour. This is especially important in areas where governments do not have the resources to support the numbers of extension agents necessary to effectively serve local communities.

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This SciPod is a summary of the paper 'An 89% solution adoption rate at a two-year follow up: evaluating the effectiveness of an animated agricultural video approach' from *Information Technology for Development*. doi.org/10.1080/02681102.2019.1697632

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