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Tools for Capturing Outcomes in Virtual Education Programs

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Abstract. During the COVID-19 pandemic, organizations increased virtual programming and adoption of online technologies. This article outlines the University of California assessment of tools for gathering data on participant learning outcomes from virtual educational programs. After assessing colleagues' experiences and searching for new web applications, a central repository was created. The University of California team will use this information to assist extension professionals in collecting program planning and evaluation data. We believe that these tools can help other extension programs nationally and globally with similar efforts, as more virtual programming is likely to increase in the future.

INTRODUCTION

Since the COVID-19 pandemic, many Extension programs have shifted to a virtual format to comply with public-health orders and keep staff and community members safe. Recent literature suggests that some of these remote program delivery methods will last into the future and that there is no returning to the pre-pandemic "normal" (Hong & Moloney, 2020). More than ever, Extension organizations recognize the need to leverage the increasing prevalence of technology in our homes and workplaces as part of the solution to emerging issues and challenges (Caillouet & Harder, 2021). At the same time, virtual work is being adopted across many sectors as an opportunity to improve employee morale and generate cost savings for organizations (Asatiani et al., 2021).

These transitions highlight the need for strategies to collect participant feedback during virtual programming for evaluation purposes, using methods best suited for different formats of virtual delivery. We, the Evaluation Capacity Building (ECB) team of University of California Agriculture and Natural Resources (UC ANR), adapted to COVID-19 workplace restrictions by designing a nine-part program development and evaluation training virtual series through the Zoom platform. During the ECB program development, implementation, and evaluation phases, our team realized the importance of using different Web- and app-based technology tools to gather participant feedback.

Currently, no central repository of tools allows for the collection of participant feedback during online Extension programming. This paper highlights various technology tools that could be used, their free and paid features, their salient benefits, and their major limitations. This compilation of tools should be of high significance to Extension professionals involved in program development, educational delivery, and program evaluation.

METHODS

We assembled a repository of technology tools based on our and our colleagues' (including program educators and evaluators) experiences in virtual classes, training, and conferences during the COVID-19 pandemic. We conducted additional research on suitable tools through using such search terms as *online whiteboard*, *polling tool*, *virtual learning community*, *tech company reviews*, and *virtual learning tool* in Google. This process helped us identify different applications that could be useful for Extension but may not have been explored yet.

During the summer of 2021, we created a Google spreadsheet to serve as a central repository of technology tool information. This repository included each tool's name, basic description, data collection type (i.e., qualitative, quantitative), benefits, limitations, participant engagement methods, data privacy, and languages and accessibility. Information about each tool was gathered through product website reviews and meetings with UC ANR program staff and administrative staff. After testing and researching each tool in the repository, we chose six to highlight in this paper as beneficial for virtual facilitation and collection of participant feedback.

Any limitations or bias within this research stems from our familiarity and ability to test the tools properly. Because we compiled information from the Internet and colleagues, many virtual tools were novel. The majority of testing was not done in active training or classrooms; instead, testing occurred in small meetings or groups that piloted only the free versions of different applications. Although all the tools in the repository were tested, the tools we and our colleagues were more familiar with were emphasized over entirely new ones, which could have created a bias in favor of more familiar and popular options. However, giving equal weight to all the inputs we received from our colleagues and the five authors of this manuscript, who are from different academic backgrounds, with program evaluation as their common ground, could have addressed any significant biases.

Table 1. Examples of Technology Tools for Applications in Extension Programming

Technology type	Tool features	Potential tools
Polling + Q&A	- Gathering qualitative and quantitative feedback - Assessing knowledge or checking understanding - Administering quizzes - Conducting ice breakers with questions or word clouds	Slido Mentimeter Poll Everywhere
Whiteboards	- Gathering data through text, notes, and images - Using digital whiteboards for collaboration - Brainstorming on a shared platform	Google Jamboard (Web-based version) Mural
Virtual lessons	- Gathering qualitative and quantitative data on participants - Gamifying learning and activities	Nearpod
Virtual meetings	- Meeting with people online by using video and audio - Recording meetings for later classes or review - Having meetings transcribed for data analysis	Zoom
Transcription	- Automatic transcription for meetings, videos, or recordings	Otter.ai

RECOMMENDATIONS

Extension programs could benefit from outlining the key program areas where these types of applications would most likely be used and identify the types of gaps they desired to fill (e.g., teaching workshops versus collecting demographic data). When searching for appropriate tools, it could save time to conduct a scan for tools already in use at a particular organization. Those tools could be vetted and disseminated more broadly through a central clearinghouse, such as UC ANR's technology tools repository.

During this process, it would be helpful to take inventory of what variables would matter most for a workplace and purpose. For example, budget constraints may be a significant factor when searching for new technology tools. For others, such issues as privacy or security may be a priority. As applicable, collaborating with institutional professional development or information technology teams to assess the feasibility and sustainability of adopting different products in extension programs could make the process more efficient. When designing a clearinghouse of technology tools, think and plan about the formats in which the information about the tools would be disseminated. For example, a Google spreadsheet or Excel workbook may work well for an internal team. However, the design and formatting may be different if you wish to share information through an organizational website or in a printable document distributed at trainings.

Table 2. Tools Prioritized by UC ANR Authors

Tool name	Tool description	Benefits	Limitations	Cost & fee structure
Slido	- Interactive presentation tool - Polling, word cloud, and quiz questions to track progress and participant responses	- Increases engagement with material - Easy to use for presenter and participants - Can integrate into Google slides and PowerPoint	- Reports only for paid account - Limited privacy on free version	- Free: up to 100 participants, unlimited audience Q&A, three polls per event - Paid: unlimited polls and quizzes, basic privacy, exports data
Mentimeter	- Interactive presentation tool - Integrates into presentation for polling, word cloud, and quiz questions to track progress and participant responses	- Increases engagement with material - Polls can be embedded into presentation (easier to access) - Exports participant responses to Excel	- Free plan limits questions asked, which can reduce engagement	- Free: two questions slides and five quiz questions - Unlimited: unlimited questions and quizzes, exports into Excel
Poll Everywhere	- Interactive presentation tool - Live audience responses and feedback through word clouds, polling, quizzes	- Live answers - Increases engagement with material - Does not need an app to use	- Cannot monitor whether someone says something inappropriate on free version - Does not integrate	Free: unlimited questions, up to 25 participants Paid: unlimited questions, 700 participants, moderate incoming responses
Nearpod	- Application that creates modules and compiles online resources for classes - Uses games, short activities, and assessments to track participants' understanding (gamification of learning)	- Increases engagement with material - Can track participant progress - Integrates with canvas (in classroom/training settings)	- Geared toward school/class setting	- Free: 40 students per lesson, 100 mb storage - Paid: 250 students per lesson, Google integration, activity and lesson bank
Zoom	- Teleconferencing software used for meetings, conferences, and classes	- Meetings can be recorded and transcribed, including chat box activity - Zoom whiteboards offer collaborative space and can be saved as a .png file - Easy to use for facilitator and participants	- Security breaches - Audio and video recording do not separate	- Free version: 40 participants with 30-minute meeting limit, unlimited meetings - Paid: transcription, cloud recording, polling
Otter.ai	- Transcription software - Uses artificial intelligence to take notes and transcribe audio and video recordings	- Easy to use - Creates searchable and shareable notes - Can upload audio files to software	- Only available in English - Limited hours on free version	- Free: 10 hours with 40-minute sessions, maximum - Paid: import recordings, add custom vocabulary, highlight words/phrases

Note. The full list of all tools can be found at https://docs.google.com/spreadsheets/d/1j7Aq3HAREkF_YXPchtfE0jQvxeBF1A390wuFYWrlCaM/edit?pli=1#gid=0.

It is also essential to consider which tools could be most readily adopted by staff and program participants. For instance, there are generational differences in adoption of technology tools and devices, such as smartphones, that host them (Pew Research Center, 2019). Individuals from different sectors may vary in their use of and comfort with technology. For example, the agricultural sector, which is a frequent focus in Extension, is often ranked as one of the least digitized sectors in the United States (Koundinya et al., 2016; McKinsey Global Institute, 2015).

IMPLICATIONS

Collaborating with institutional information technology or professional teams could help streamline the process of testing and disseminating technology tools. At UC ANR, for example, the information technology team evaluates every new technology tool, whether free or paid, before any individual employee uses it. Special considerations are made for privacy and security at UC ANR whenever new tools or applications are used with youth audiences. Keep in mind that most tools have some type of fee structure: Some are available entirely free of charge, while others may offer tiers of features and functionality at different costs. Consider how your preferred tools could be built into your budget to support your efforts over time.

Once your team and other relevant parties vet your tools, your program should be able to leverage these technologies to capture real-time data in virtual settings. UC ANR has implemented participant feedback tools in meetings, trainings, internal and external workshops, and events. This strategy has allowed our organization to check for learning and understanding, collect important participant feedback or preferences, and evaluate the effectiveness of various trainings and events. In addition to gathering evaluation data, using technology tools in these settings can be part of learning and teaching itself through such functions as polls and virtual presentations, supporting a more active and engaging experience for participants. Even though many of the tools identified by UC ANR are designed for the education sector, we believe that they could benefit Extension professionals. We will continue to monitor the effectiveness and sustainability of incorporating these tools into Extension programming, while acknowledging that more learning and experimenting are needed.

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