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Improving Extension Curriculum Design Using Learner-Centered Templates

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Cover Page Footnote

Correspondence regarding this article should be addressed to Mary L. Halbleib, Oregon State University, Dept. of Crop and Soil Science, 107 Crop Science Bldg., Corvallis, OR 97331. Email: mary.halbleib@oregonstate.edu This material is based upon work that was partially supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2015-38640-23779 through the Western Sustainable Agriculture Research and Education program under sub-award number EW16-010.

Improving Extension Curriculum Design Using Learner-Centered Templates

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Abstract. Extension professionals' use of learner-centered instructional practices can maximize engagement and more effectively address expressed needs within their diverse communities. The Outcome-Based Extension Education Design and Facilitating Teaching and Learning templates enable educators to effectively implement curricula that identify context-specific learner needs, activities that increase learner engagement, and assessment tasks that gather evidence of essential knowledge construction and skills development. Using these two practical tools, Extension professionals can streamline the creation of compelling and efficacious programs that focus on the intended learning outcomes.

INTRODUCTION

Extension professionals often enter their careers with significant expertise in their area of specialty but limited or no training in the science of teaching and learning. Lacking the knowledge or skills to design educational programs, these professionals may feel overwhelmed or frustrated within their roles, leading to higher turnover rates (Safrit & Owen, 2010). In such cases, Extension professionals may be at risk of implementing suboptimal educational initiatives within the communities that they serve and reducing their overall impact.

A common response to not knowing how to operationalize the latest science of learning is the overuse of lecture as a teaching strategy. Though this more passive approach is often simpler to implement than forms of learner-centered instruction, research shows that increased participation through interactive teaching improves learners' information retention (Deslauriers et al., 2011). Enabling educators to employ an outcome-based educational framework increases engagement by focusing the instructional design on the application of information and skills that learners can use to meet real-world challenges (Spady, 1994; Stiehl & Sours, 2016).

To address the gap between instructional design and evidence-based practices, I built upon the work of Spady (1994) and Stiehl and Sours (2016), as well as my own experience as an outcome-based curriculum design educator (Halbleib et al., 2021; Halbleib & Jepson, 2016, 2015), to create the overarching Outcome-Based Extension Education Design Template seen in Table 1 and the more detailed Facilitating Teaching and Learning Template seen in Table 2. Both templates were piloted with Extension professionals in a term-length curriculum development course in 2019. Based on feedback from learners regarding the value of the templates, two template-specific classes were offered in 2020. Since the completion of these courses, more detailed instructions and guidance have been integrated into the templates, allowing Extension faculty to utilize the documents independently and without training.

The purpose of the templates is to allow educators to think constructively about the needs of learners and to assist them with the organization of their ideas and time, thereby maximizing opportunities for engagement. Extension professionals are provided with two copies of each template; the first contains step-by-step instructions for how to fill in each box, as well as examples, while the second is blank for educators to complete with their own content. Both templates are appropriate for designing online or in-person courses and can be adapted to accommodate educational programs of varying length and complexity, from a single event to a term-long series.

EXTENSION PROGRAM DESIGN TEMPLATES

The Outcome-Based Extension Education Design Template serves as the basis for program development by enabling educators to clarify the aims of their educational program and how they plan to achieve them using learner-centered approaches. The four sequential design steps include:

- *Learning outcomes*: Development of measurable learning outcomes to clearly define the overall purpose of the program and assist with centering the “bigger picture” in curriculum construction.
- *Assessment tasks*: Identification of measurable or observable assessment tasks that provide evidence of learner progression towards the intended outcomes.
- *Learning activities*: Creation of learning scenarios that mirror the real world and deepen learning through the practice of new skills and application of new knowledge.
- *Essential knowledge*: Selection of information needed for learners to comprehend both why and how they will be completing the learning activities.

OUTCOME-BASED EXTENSION EDUCATION DESIGN TEMPLATE

Purpose: To provide a cohesive structure for your program that will support an instructional design focused on learning outcomes. By working through this logical sequence of elements, you will create a program that meets the real-world needs of learners. Refer to this completed template when using the Facilitating Teaching and Learning Template. If you are not working in a team, seek feedback on your design from colleagues.

To use this template: Review the guidance and the farmer workshop example for Steps 1-4 provided inside each box. If you would like a blank copy of this template, please contact the author.

Program: Reducing Pesticide Drift to Protect Surface Water **Designer(s):** [Project team members]

Session Time: 90 minutes **Estimated Class Size:** 40 **Learning Environment:** classroom

Intended Audience: farmers, landscape care, gardeners, other pesticide users, agency personnel, non-profit staff

Table 1. Outcome-Based Extension Education Design Template

Learning Outcomes (Step 1)	Assessment Tasks (Step 2)	Learning Activities (Step 3)	Essential Knowledge (Step 4)
<u>Description:</u> Learning outcomes clearly state what learners will be able to do after the course. A single-session workshop might have 1-3 outcomes, while a larger program with multiple sessions might have more. Ideally the assessment tasks, learning activities, and knowledge components are interconnected and collectively build towards one or more of the outcomes.	<u>Description:</u> Assessment tasks allow instructors to measure the progression of learning. If necessary, the instructors can adjust their teaching to assist learners in achieving desired outcomes. Assessment tasks may be embedded within learning activities.	<u>Description:</u> Activities increase the relevance and value of the learning by allowing learners the opportunity to practice skills and apply new knowledge. These activities aid learners in remembering new skills and effectively transferring their learning to other contexts.	<u>Description:</u> Essential knowledge is the key information learners must acquire to effectively apply new skills and achieve the learning outcomes. When identifying essential knowledge, remember that adult learners are most likely to retain information that is relevant to their real-world experiences and lives.

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Table 1. (continued)

Learning Outcomes (Step 1)	Assessment Tasks (Step 2)	Learning Activities (Step 3)	Essential Knowledge (Step 4)
<u>Task:</u> Create a learning outcome statement. Include a verb (action) that describes the learning outcome, the content of the learning process, and the context for how or where the learning will take place.	<u>Task:</u> Select observable or measurable tasks learners can complete to demonstrate their knowledge and skills. Options include self, peer, and/or instructor-based assessment. Examples include clicker quizzes or other forms of polling, individual or group work, think-pair-share, and discussion.	<u>Task:</u> Develop active learning scenarios using real-world data and information. Example skill building activities include problem solving, case examples, demonstration, role play, predictions, and planning or decision-making exercises.	<u>Task:</u> Review the learning activity to determine the skills the learners will be practicing. Then examine each skill (and any related sub-skills) to identify specific concepts that learners must comprehend to effectively practice the new skills and complete the learning activities.
Example: <i>Identify (action) lowest-risk conditions for a pesticide application using a five-day weather forecast (content) to reduce the chance of off-field pesticide losses to sensitive sites (context).</i>	Example: <i>Before factoring in a sensitive site location (learning activity, step 3) learners share why they selected specific pesticide application timings in a group discussion.</i>	Example: <i>Learners work in pairs using a farm map, five-day weather forecast data, and other farm information to identify pesticide application timings that will reduce losses to the sensitive sites.</i>	Example: <i>Weather and climate, probability, weather forecasting, and weather drivers of pesticide drift.</i>

While determining learning methods and essential content is necessary for developing an effective curriculum, educators must also consider how they prioritize instructional time to ensure adequate opportunities for learners to practice applying new skills, interact with peers, and ask questions or share insights. The Facilitating Teaching and Learning Template, clarifies the purpose for all segments, ensures adequate time is allotted for each activity, and identifies the shifting roles of the learners and instructors to ensure that curriculum materials remain focused on the learner. The four sequential planning steps include:

- *Segment and Purpose:* Identification of each segment in the session with a clear purpose for each block of time.
- *Activities:* Description of each learner-centered activity.
- *Roles:* Clarification of the changing roles for instructors and learners throughout the session.
- *Time:* Allocation of adequate time for each activity.

FACILITATING TEACHING AND LEARNING TEMPLATE

Purpose: To assist in determining the best use of program time and to ensure maximization of learner engagement. This document will also help you to avoid overfilling your program given the time allotted and to inform others of the learning plan and their roles. The example of an in-person workshop provided below shows a specific use of this tool. You can use this tool to plan a range of educational events including online trainings, field days, and other learning program formats. If you would like a blank copy of this template, please contact the author.

To use this template: First, review the completed Outcome-Based Extension Education Design Template for the program, if using that resource. Then, for this template:

1. Edit the Segment and Purpose cells to fit your program.
2. Populate the Activity cells with descriptions of each segment.
3. Identify specific roles for the instructors and learners for each activity.
4. Determine the time necessary for each activity, and then check that the total time is not more than time allocated for the program.

Considerations for estimating time:

- Be sure to leave enough time to introduce each process and to allow for possible questions.
- For learning activities, you can estimate the necessary allotted time to be about three times as long as it would take you, the instructor, to complete.
- If using discussion or other forms of sharing, ensure adequate time for learners to contribute and to listen to others. When this goes well, it can take a fair bit of time, but it is a valuable way to increase engagement and deepen learning.
- For online learning experiences, allow two to three minutes for each technology transition.

Tips:

- To best hold the attention of participants, it is ideal to change activities at least every 20 minutes.
- Program activities often take longer than we predict. Aim to build in 5 or 10 minutes of buffer time every hour to allow for unexpected overages and delays.
- Be sure to give the learners clear guidance on their changing roles throughout the program.

Program: Reducing Pesticide Drift to Protect Surface Water **Instructor:** Mary Halbleib
Session Time: 90 minutes **Date:** TBD **Format:** in-person, classroom **Estimated Class Size:** 40

Table 2. Facilitating Teaching and Learning Template

Time (Step 4)	Segment and Purpose (Step 1)	Activity (Step 2)	Instructor Role (Step 3)	Learner Role (Step 3)
15 min before start	<u>Pre-session engagement:</u> Participants informally interact with each other and the instructors	<i>Conversation with coffee</i>	<i>Welcome participants and introduce yourself</i>	<i>Connect with others in the course</i>
7 min	<u>Welcoming the learners:</u> Create a safe, enjoyable environment	<i>Welcome learners and create a sense of community through introductions</i>	<i>Set an example of openness by sharing about yourself</i>	<i>Engage as they are willing and able</i>
3 min	<u>Setting the vision:</u> Link expected outcomes to the learners' lives and work	<i>Share the learning outcomes and provide an overview of recent pesticide detections in surface water</i>	<i>Link the outcome to real world needs that relate directly to the learners' lives</i>	<i>Ask questions</i>
5 min	<u>Activating existing knowledge:</u> Build upon the learners' backgrounds and interests	<i>Ask learners to get up and find a partner to share one fact they already know about pesticide drift management, then ask a few pairs to share with the rest of the group</i>	<i>Ask the learners to introduce themselves to their partner and listen openly to what is shared with them</i>	<i>Share their knowledge and experience managing pesticide drift</i>
10 min	<u>Knowledge sharing:</u> Convey essential knowledge for the learning activity	<i>An interactive lecture on the difference between climate and weather, the process of weather forecasting, and options for managing weather driven pesticide drift</i>	<i>Ask questions of the learners and allow time for comments</i>	<i>Add their experiences and ask questions</i>

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Table 2. (continued)

Time (Step 4)	Segment and Purpose (Step 1)	Activity (Step 2)	Instructor Role (Step 3)	Learner Role (Step 3)
15 min	<u>Learning activity – Part 1:</u> Provide an opportunity for skill building that applies new knowledge	<i>In small groups, learners use a weather forecast to identify lowest-risk pesticide application timings</i>	<i>Provide clear instructions and supportive guidance, monitor learner responses</i>	<i>Actively engage in the learning process by working with group members</i>
10 min	<u>Feedback to learners:</u> Use a form of assessment to gauge progress towards the learning outcome	<i>As a whole group, learners are asked to explain why they selected one or more pesticide application timings</i>	<i>Adjust teaching to further assist learning, as needed</i>	<i>Share why they selected specific pesticide application timings</i>
5 min	Break			
5 min	<u>Learning activity – Part 2:</u> Increase the level of difficulty to expand knowledge application and skill practice	<i>Using the farm map, learners locate sensitive sites and determine if the selected application timings will also be protective of those sites</i>	<i>Provide further instructions and supportive guidance</i>	<i>Actively engage in the learning process by contributing to the completion of the activity</i>
10 min	<u>Reflection and next steps:</u> Support sharing of new insights and intentions for change after the session	<i>Learners are given 5 minutes to reflect and complete a form to record their intentions for new or altered practices and 5 minutes to share with a partner</i>	<i>Allow learners to plan what actions they will take and then verbalize their intentions with a partner</i>	<i>Identify what from this learning experience has value and will transfer to their lives and work</i>
5 min	<u>Session evaluation:</u> Gather information on how the session supported learning and what can be improved	<i>Learners complete a brief post-session survey</i>	<i>Explain the value of the evaluation to the program</i>	<i>Complete the survey</i>
5 min	<u>Closing:</u> Enable the learners to share the benefit of the session	<i>Learners are asked what they found most valuable from the session and then the instructor outlines next steps in the program</i>	<i>Acknowledge the work the learners did and generate sustained interest in the program</i>	<i>Share insights that will make a difference in their lives and work</i>
Total time:				
80 minutes + 10 minutes of extra time				

CONCLUSION

Research indicates that Extension programming capacity and professional growth are key competencies of interest for Extension professionals throughout their careers (Brodeur et al., 2011). Thus, it is vital that these educators have access to learning resources that are expressly created for the Extension context and grounded in research-informed practices (Epley, 2019).

The two templates allow Extension professionals to implement evidence-based teaching and learning approaches to increase impact. This success was demonstrated in a ten-week course called Extend Your Teaching and Learning to Enhance Sustainable Agriculture. Post-course evaluations found that five of seven participants had used these templates to design additional Extension programs following the completion of the class. Three educational partnerships across the state of Oregon have also utilized these tools to create learner-centered

programs focused on increasing the adoption of integrated pest management practices (Halbleib et al., 2021). While Extension professionals are often experts within their fields, poor curriculum design and ineffective learner engagement can pose challenges to maximizing the impact of their programs. The Outcome-Based Extension Education Design and Facilitating Teaching and Learning templates better allow these professionals to more effectively focus their time with learners in order to increase achievement of the intended learning outcomes.

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