Learning to Burn: A case study on the redesign of federal prescribed fire training in the U.S.

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To restore ecosystem health and reduce the negative impacts of wildfire, scientists and land managers argue that more prescribed fire is needed on the land. However, a lack of effectively trained personnel in the role of "burn boss" is a barrier to increasing safe and effective prescribed burning. Burn bosses are responsible for planning and implementing prescribed burns. There are two key contributors to the shortage of these positions: the first is retirement without replacing personnel, and the second is insufficient training mechanisms necessary to increase the number of personnel capable of responding to the challenges of conducting prescribed burns. This research brief summarizes a case study on the redesign of federal prescribed fire training, utilizing up-to-date understanding of adult learning to enhance training effectiveness.

KEY FINDINGS: Students

- Engage in continuous goal setting: set and revise goals before, during, and after the course to maintain motivation and provide a clear outcome objective.
- Address barriers and motivations: be open to discussing preconceptions or prejudices from prior experience during the course
- Actively engage in skills practice to build self-efficacy: Use the course & instructors as a chance to get valuable guidance and feedback.
- Consider the course as part of a continuous learning process, identify post-course goals and build supervisor and peer support to achieve them.

KEY FINDINGS: Supervisors

- Supervisor support is a critical organizational lever to student success.
- Provide time for a one-on-one meeting to discuss course objectives and students' personal goals in applying the course material. A 15-minute conversation before and after training can significantly increase training transfer.
- Support the application of concepts after training: provide opportunities for the application of new skills and ensure the student has the time and workload capacity to apply their skills once they return to the workplace.

KEY FINDINGS: Instructors

- Use examples: share local or personal stories to link course objectives and applicable concepts
- Maximize applied practice: provide students with ample time to synthesize information and practice making decisions (30-50% of course time), rather than passive listening.
- Offload technical training: fire modeling training should be completed prior to the class to allow students time in-class for active practice, group work, and discussion of concepts.
- Address mental barriers early: provide space to openly discuss students' preconceptions regarding training at the start of the course and outline course expectations.
- Guide students in goal setting and implementation plans: provide coaching to help refine objectives into concrete, actionable steps, and reach out to trainees several months after the course to check in on their implementation progress.

Table 1. Comparison of the original and the revised burn boss course.

Course phase	Original course	Revised course
Precourse	• 4 hours • Pre-selection assessment testing fire modeling skills	• 24 hours • 5 self-paced online trainings • Personal implementation plan
During course	• 56 hours • Two courses (RX-341, RX-301) • Objectives not tied to the duties and responsibilities of a burn boss • Training devloped by SMEs • Focus on implementation • Pre-established scenarios • Final project is to write a burn plan from scratch based on a given scenario • In-person delivery only • No learning management system • High likelihood for variability between offerings • Separate presentations and instructors guide • Less frequent opportunities for application • Trainee groups with no coaches • Limited cadre instructions • Daily quizzes • Genaric course survey	• 40 hours • One course (RX-300) • Objectives tied directly to the duties and responsibiliies of a burn boss • Training developed by professional educator with support from SMEs • Focus on planning • Cadre informed scenarios • Final project is to review and revise an existing burn plan provided by the trainee • In-person or virtual delivery • Wildland Fire Learning Portal • Lower likelihood for variability between offerings • Integrated presentations and instructors guide • More frequent opportunities for application • Trainee groups with dedicated coaches • Detailed cadre instructions • Daily reflection and goal setting
Postcourse	• Nothing	• Specialized course survey • Supervisor support letter (recommended) • Contact trainees to check on progress in their personal implementation plan (recommended)

LIMITATIONS

Effective course design relies heavily on proper execution by instructors. Updating RX-300 to include elements such as discussions about mindset and applying course material after the course are outside the norm for typical wildland fire training. Instructors must familiarize themselves with these elements of the course in order to teach it effectively. Additionally, there are elements beyond training that are required to fully develop professionals. A lack of clear designation about who will teach off-fireline duties can lead to inconsistent or nonexistent standards. In short, building the next generation of wildfire practitioners will take collective effort from all parties, from agencies, colleges, contractors, and beyond.

CONCLUSION

To address the lack of effectively trained personnel required to increase the pace and scale of prescribed fire, effective training and instruction are critical. In order to build self-determined and self-directed learners, we need to increase student autonomy and change the instructional model to incorporate more independence. This requires course instructors and supervisors to create space for students and help facilitate and implement training concepts.

ADDITIONAL INFORMATION

Heather Heward, Laura Holyoke, Leda Kobziar, (2024) Learning to Burn: A Case Study on the Redesign of Federal Prescribed Fire Training in the United States Using the Twelve Levers of Transfer Effectiveness, Journal of Forestry, Volume 122, Issue 5-6, Pages 483–492, https://doi.org/10.1093/jofore/fvae022

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