



Developing teachers and faculty to be change agents promoting the value of rangelands: impacts of the Prairie Project Educator Cohorts

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Abstract

Creating spaces and opportunities for teachers and faculty to become agents of change is central to promoting public understanding of the ecological and societal values of sustainable rangeland production and ecosystem services. One promising effort was the Prairie Project Educator Cohorts, which targeted the four domains of Clarke & Hollingsworth's (2002) Interconnected Model of Teacher Professional Growth. Housed within the overall Prairie Project (a federally funded grant collaboration between Texas A&M, Oklahoma State, and the University of Nebraska, Lincoln), the program trained educators from grades 6-16 on the threats to grasslands and effective management solutions. Participants from schools across TX, OK, and NE learned about pyric herbivory and mixed-species grazing during a summer workshop and field tour, then incorporated their new knowledge into a course of their choice during that fall or spring. A team of Extension professionals and teaching experts from the three collaborating universities led monthly online cohort meetings and were assigned to each educator as mentors. To assess the effectiveness of the Educator Cohorts, a summative qualitative evaluation was conducted. Data were collected through focus groups and individual interviews conducted over Zoom, and observations during cohort meetings. Thematic analysis was employed using an inductive approach to analyse the data. Findings revealed that the educators had significant advances in their knowledge of pyric herbivory, multi-species grazing, and the severity of the impact of woody plant encroachment. They also expressed that they were able to create powerful research-driven learning experiences for their students. Additionally, educators served as agents of change by sharing their instructional materials with their colleagues and supervisors and their new knowledge with friends and family who managed land. These data provide evidence that a comprehensive cohort program be an effective approach to professional development programming for educators that ultimately increases the rangeland literacy of their students.

Introduction

Empowering educators to be agents of change is an important way to get future generations interested and engaged in rangelands. Educators have a significant impact on their students' awareness of and orientation toward science (Keller et al. 2017). Equally, they have the ability to disseminate information horizontally to their peers within the profession (Supovitz et al. 2010). With experience and expertise, educators can be opinion leaders in their fields through sharing novel recommendations and innovative ideas (Fairman and Mackenzie 2015). Thus, creating spaces and opportunities for teachers and faculty to become agents of change is central to promoting rangelands and related best management practices. The aim of this study was to investigate the experiences of instructors who completed the Prairie Project Educator Cohorts - a two-year

professional development program for K-12 teachers and higher education faculty from schools across Texas, Oklahoma, and Nebraska.

Housed within the Prairie Project (a federally funded grant collaboration between Texas A&M University, Oklahoma State University, and the University of Nebraska, Lincoln), the program trained teachers and faculty about the science of rangelands with an emphasis on the threats to the land and management solutions to overcome them. In the first year of the program, educators learned about pyric herbivory, mixed-species grazing, and high impact teaching strategies during a virtual summer workshop. The technical content was delivered by Prairie Project research scientists who the educators later got to meet in-person through a multi-state field tour.

Next, the educators incorporated their new knowledge into their curriculum via an active learning strategy of their choice. The lessons they created ranged from interrupted case studies to collecting data in the field and creating public service announcements. For support, each educator was assigned two mentors from a team of Extension professionals and teaching experts from the three collaborating universities. Further assistance was provided by the mentors through monthly online cohort meetings that included continuous education. In the second year, each educator led one monthly meeting to share about the design, implementation, and evaluation of their classroom project. Educators were required to give a similar presentation at a conference or professional setting of their choice. The educators received funding for travel and classroom supplies, and a stipend.

The conceptual framework for this study combines two existing theories and a model. The first theory is the theory of teacher change (Wayne et al. 2008), which focuses on teachers changing their knowledge or behaviour as the result of participating in specific activities. The second is the theory of instruction (Wayne et al. 2008), which promotes that teachers make changes based on increases in their knowledge. Both of these theories are leveraged in the Prairie Project Educator Cohort program. These theories align well with Clarke & Hollingsworth's (2002) Interconnected Model of Teacher Professional Growth.

Methods

This study employed a phenomenological research design, specifically existential phenomenology, to examine the perspectives of the educators who completed the Prairie Project Educator Cohort program. This qualitative research approach involved seeking detailed descriptions and interpretations from participants to understand the meaning of their lived experiences.

The sample population consisted of all the K-12 teachers and higher education faculty who completed any of three cohorts of the program (Cohort 1 2020-2022; Cohort 2 2021-2023; Cohort 3 2022-2024). Twenty six educators participated in the study (eight men and 18 women). The grade level breakdown was one middle school teacher, 12 high school teachers, and 13 faculty members. No other demographic information was captured.

Data were collected through two focus groups (one conducted in May 2022; the other in June 2024), and 16 individual semi-structured interviews completed between 2023 and 2024. Both the focus groups and interviews were conducted and recorded via Zoom and varied in length between 45 minutes and 90 minutes long. The same questions were used for the focus groups and individual interviews and included prompts such as: "how and why did you choose the instructional strategies for your lesson?", "how did your students react to the lesson?", "how have you shared your instructional materials beyond our official Prairie Project outlets?", and "in what ways did the Prairie Project contribute to your ability to serve as an agent of change?".

The focus groups and interviews were transcribed verbatim through online audio to text converters. An undergraduate student worker then listened to each recording while reading the corresponding transcript to correct any errors.

Evaluation coding (Rallis & Rossman, 2003) was used to analyse the transcripts to examine the significance of the Prairie Project Educator Cohort program. As noted by Saldaña (2016), evaluation coding can consist of multiple coding methods as the data analysis has to align with the structure of the program evaluation. Two members of the project staff were involved with coding. Independent and collaborative coding took place to create a codebook and gain confidence in the consistency of how the codebook was being applied. The codes were then organized into themes. Theme identification was an inductive, reflexive process that occurred over multiple meetings through critical discussion.

Results

Four overarching themes were identified from the dataset: educator development, educator takeaways, agent of change, and program feedback.

Educator Development

The first theme focused on changes in skills, knowledge, and attitude among the educators. Even though most of the educators were familiar with grasslands and rangelands, their specific knowledge of prescribed fire, patch burn grazing, and multispecies grazing increased through their participation in the cohort program. Two quotes captured many of the sentiments in this theme. One educator shared, "I think the biggest impact would just be more knowledge on something I thought I knew a lot about". Another said, "Good stuff. Yeah. I didn't have a lot of information on [mixed-species grazing]. That was all pretty new knowledge for me". The educators either thought they knew quite a bit about the topics and they were able to learn significantly more from us, or they learned something new and were enthusiastic about it.

The educators also expressed that their teaching (content delivery, classroom management, etc.) was impacted by their experience. One person described a "lightbulb moment" she had when a speaker said that it was important to make sure that they were not teaching to themselves and their learning preferences, and to keep their focus on being student-centred. The educator said she began to reflect on how she taught in the past and then made adjustments to make her classroom more inclusive to the different ways students learn. She claimed, "it made me a little bit more empathetic, which is a good thing to me as a teacher...it probably helps me make my classroom more inclusive".

Educator Takeaways

The second theme focused on educator gains that were not related to personal growth. Besides being equipped with new knowledge and resources, a big takeaway for the educators was the community they developed both among themselves and with the program facilitators. One educator remarked, "And so it just gives me another group of people that I've met and been able to engage with and could call colleagues, basically at some at some level. It may not be that you're engaging with them regularly. But if I were to email anybody, Oh, yeah, I'm happy to help, or, you know, like, that's the that's the general sentiment across the group yet. you know. So I think it really built another new collaborative group of people which is fantastic".

On a related note, others appreciated the respectful and encouraging environment that was created. One teacher said, "Hearing from other teachers and faculty that they were dealing with that as well was kind of nice to make me maybe not think I was the only one that was struggling with that". The monthly cohort meetings became a brave space for educators to share successes and challenges with each other.

Agent of Change

The third theme highlighted the ways educators acted as agents of change regarding rangeland science and best management practices. This included how they shared their new knowledge and the curriculum items they created with others beyond the program requirements. A faculty member shared, "I've shared the unit with...a plant taxonomist here that teaches biogeography actually. And she was really interested...I've shared some of the information in passing our Dean as a former plant taxonomist as well." Others were agents of change in their personal networks. An educator stated, "My understanding of rangeland management changed a lot during this process, and you know that was great for me from the education standpoint. But still, personally raising

cattle and having some very good friends that have some pretty big operations up in the northern part of the state, you know, just being able to pass that information on to them. And when they've got questions, they can kind of lean on me a little bit more”.

Program Feedback

The fourth theme encompassed reflections on the program components had a significant impact, as well as ideas for program improvement. Most of the educators expressed that they valued being able to have resources that connected students to local relevant science and something students could see within their neighbourhoods. A teacher said, "just cool to be part of something region wide...it was useful for the students. I think it helped with engagement for them to see that the topic we're talking about are really important throughout the whole Great Plains“. Another teacher shared how one of her students enthusiastically told her, “this it legit, Miss!” as he was able to understand the real-world application of what they had just learned in the classroom.

Additionally, the educators appreciated the autonomy they had to create their lessons. One person remarked, “I thought that was one of the real strengths of the program. And it wasn't really prescriptive which I think opened up creativity and allowed us to, in some cases, use some of our own strengths in that project”.

The most common piece of program feedback was that the educators wished they had more opportunities to meet and collaborate in-person with each other. However, a couple of educators also noted that while they would have liked to have spent more time together in-person, that it would not have been feasible due to the demands of the academic year.

Discussion/Conclusions/Implications

These findings align with the growing body of literature that emphasizes the importance of professional development that enhances content knowledge and fosters a supportive community of practice. In the first theme underscores the importance of continuous learning in professional development programs. Additionally, the reported changes in teaching strategies highlight the program’s influence on pedagogy and suggests that such programs should not only focus on content knowledge but also support educators in adopting reflective and adaptive teaching practices that enhance student engagement and learning outcomes (as proposed in the conceptual framework).

The sense of community described in the second theme is consistent with research on professional learning communities. The ability to reach out to fellow educators and facilitators for advice or support not only enhanced participants' sense of belonging, but also contributed to a culture of ongoing professional dialogue. This sense of camaraderie and mutual support may serve as a catalyst for sustaining the changes in teaching practices initiated by the program.

The third theme illustrates the broader impact of teacher training programs, where educators extend their influence beyond their classrooms and contribute to the community at large. The educators' roles as agents of change underscore the importance of equipping them with not only content knowledge but also the confidence and resources to share that knowledge with others.

One of the most notable positive aspects was the opportunity to connect students with local science, which helped make the content more tangible and engaging for learners. This finding supports the idea that placing educational content within a local context can enhance its relevance and foster greater student interest.

Overall, the findings from this study suggest that the cohort program had a profound impact on educators' professional development; educators were empowered to become agents of change. Future program improvements should focus on enhancing opportunities for in-person collaboration while maintaining the flexibility and autonomy that educators found valuable.

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