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frontiers | Frontiers in Sustainable Food Systems

TYPE Original Research
PUBLISHED 23 January 2026
DOI 10.3389/fsufs.2025.1715791

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OPEN ACCESS

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RECEIVED 29 September 2025
REVISED 22 December 2025
ACCEPTED 26 December 2025
PUBLISHED 23 January 2026

CITATION
Berríos-Ortiz L, Kubinski E, Lattes S, Menalled F and Ebel R (2026) The edible weeds feast: an experiential assignment for agroecology, food systems, and weed science higher education.
Front. Sustain. Food Syst. 9:1715791.
doi: 10.3389/fsufs.2025.1715791

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The edible weeds feast: an experiential assignment for agroecology, food systems, and weed science higher education

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Introduction: Given growing challenges in agriculture and food systems, such as climate change and economic instability, higher education must train professionals to work across disciplines and address complex, real-world problems. Preparing students for dynamic and uncertain environments requires not only technical knowledge but also collaboration and critical reflection, which can be enhanced by experiential education. For Agroecology, Food Systems, Weed Science, and similar higher education programs, the topic of edible weeds provides an excellent context for interdisciplinary experiential learning. Edible weeds are common, yet undervalued components of the associated agrobiodiversity that simultaneously present crop management challenges for farmers and nutritious food sources. This dual role makes edible weeds an ideal entry point for students to critically reflect on the challenges of our food systems and connect ecological and cultural dimensions of food. To explore this potential, we developed the Edible Weeds Feast, an assignment for Ethnobotany and Weed Ecology undergraduate students at Montana State University.

Methods: Working in teams, students identify and collect edible weeds, design recipes, present their chosen species' ecology and nutritional properties, and prepare dishes for a shared meal. We present students' assessments of this assignment conducted in 2023 and 2024, using post-assignment surveys and focus group interviews.

Results: Findings revealed strong overall approval of the Edible Weeds Feast. Students reported perceived knowledge gains in several fields, from plant identification to the cultural significance of wild plants, with the strongest perceived gains on the nutritional benefits of edible weeds. The positive overall assessment did not differ between students in Ethnobotany and Weed Ecology. Students emphasized that the experiential, collaborative structure of the assignment enhanced their enjoyment and deepened their learning, while also facilitating exchange between agricultural and food systems perspectives. Critical student feedback centered on organizational aspects, for example, the timing of the plant gathering, which will inform refinements of future iterations.

Discussion: The Edible Weeds Feast represents an impactful experiential and interdisciplinary assignment that can inspire similar pedagogies in higher education.

KEYWORDS

agrobiodiversity, experiential pedagogy, interdisciplinary education, Montana, nutrition

1 Introduction

The global food system is confronted with a range of interconnected challenges that highlight its inadequacies in promoting both human and planetary health (Hofman-Bergholm, 2022). Challenges that hinder its success include biodiversity loss and habitat degradation from land use change, as well as natural disasters such as droughts and wildfires, all intensified by the escalating impacts of climate change (Herforth et al., 2019). We are facing disruptions in food supply chains due to political and economic conflicts, pandemic outbreaks, as well as the concentration and abandonment of farmland (Rotz and Fraser, 2015; Ericksen et al., 2012). On the nutrition side, the rise of non-communicable, diet-related diseases highlights the inefficiencies of the current food system in feeding humans appropriately, while approximately one in nine humans continue to suffer from hunger (Belahsen, 2014).

Enhancing food system resilience to address these issues requires a systemic approach that integrates the principles of agroecology and sustainable diets (Wezel et al., 2020). A pillar in this regard is the promotion of agrobiodiversity, which sustains both functioning agroecosystems and dietary diversity (Kerr et al., 2021; Altieri and Nicholls, 2020). Among the 50,000 recognized edible plant species, only 15 are considered staples, out of which three provide 60% of food energy (Gruber, 2017). This is a direct consequence of the industrialization, mechanization, and homogenization of the global food system that occurred over the past 150 years, leading globally to low crop and, consequently, dietary diversity (Ebel et al., 2022). Efforts to increase agrobiodiversity, especially in mechanized farming systems, center on diversifying crops grown on a specific field but rarely consider spontaneously growing non-crops (associated agrobiodiversity), commonly disregarded as weeds (Ebel et al., 2024).

In the broadest sense, a weed is a plant growing where deemed undesirable for a specific human goal (Gwynne and Murray, 1985). Weeds are, therefore, a social construct, defined not only by the ecological context in which they occur, typically agricultural fields, but also by the human perceptions and management goals that render them undesirable (Merfield, 2025). Despite weeds' negative impacts on crops, they can offer numerous ecosystem services (Esposito et al., 2023). For example, under conditions of a diverse weed community, they can enhance pollination and biological control by supporting pollinators (Adhikari et al., 2019) and natural enemies of crop pests (Landis et al., 2005), or assume functions analogous to those of cover crops (Baraibar et al., 2021). In addition, a substantial share of weed species consists of plants suitable and valuable for human consumption, resources largely overlooked in conventional agriculture but long recognized in traditional farming systems (Ebel et al., 2024).

Edible weeds are defined as spontaneously growing plants that live in close association with crops and, while not cultivated, can provide alternative sources for human nutrition (Ebel and Menalled, 2025; Egerer and Philpott, 2022). Edible weeds can be managed to provide ecosystem services instead of being indiscriminately removed from crop fields. One example is to selectively harvest edible weeds from non-edible ones (Menalled and Ebel, 2025). This must occur in a timely manner to minimize impact on the main crop, for example by considering the critical period of weed control for crops, trait-based approaches, and the phenology of the edible weed species (dos Santos et al., 2025).

To our knowledge, the potential of weeds as food sources for humans remains largely absent from higher education in most countries, including the US. Since these programs train key stakeholders in weed and agroecosystem management, the consideration of edible weeds is crucial for disciplines such as weed science, agroecology, and food systems.

Essential aspects of food-systems-related higher education include systems thinking, co-creation of knowledge, critical knowledge-sharing, experiential learning, enhancing collective action and advocacy, all within a transdisciplinary approach (Landis et al., 2005; Ebel et al., 2020). Assignments that encompass these learning outcomes have a strong potential to engage students in deep learning experiences, particularly through experiential learning where conceptual knowledge and firsthand experiences are tied together (Ebel et al., 2020), leading to a deeper understanding and better retention of concepts by students (Kolb, 2014).

We identified the topic of edible weeds as suited to meeting the criteria for such deep experiential learning. By involving students directly with processes of observation, planning, harvesting, cooking, and reflection, teaching with edible weeds can transform abstract concepts from lectures into lived experiences, an essential foundation of pedagogy for both effective weed management and food system transformation (Ebel et al., 2020; Gallagher et al., 2007). In addition, the topic offers a unique opportunity to connect an agriculture-focused subject with a hands-on activity in food preparation, another part of the food system (Stein, 2025).

Learning about edible weeds encourages students to employ a systems thinking approach, that is, to recognize the connections and interactions among components of a system rather than viewing them in isolation, a necessary step in understanding complex problems (Kefalas, 2011). Because edible weeds sit at the intersection of ecology, agriculture, and culture, they offer students from multiple disciplines a distinctive opportunity to apply systems thinking to the social, ecological, and management dimensions that shape how plant species are defined, perceived, and managed within agricultural and food systems (Stein, 2025). For food systems students, systems thinking enables the analysis of how ecological, social, economic, and cultural factors interact to reveal leverage points for transformation (Valley et al., 2018). For students of more technical disciplines such as weed science, systems thinking supports the ongoing paradigm shift toward ecological weed management, which emphasizes managing weeds within the broader agroecosystem rather than as isolated pests (Liebman et al., 2001). Through this lens, students gain a deeper understanding of how weed populations, including edible weeds, respond to the combined influences of ecological processes, management decisions, and cropping system dynamics (Liebman and Gallandt, 1997; MacLaren et al., 2020).

At Montana State University (MSU), we, therefore, developed the "Edible Weeds Feast," an experiential interdisciplinary team assignment for undergraduate students from two courses: Ethnobotany and Weed Ecology & Management. In this assignment, we familiarize students with food and other potential uses of edible weeds in Montana. The assignment was embedded in respective course lectures. Students collaborated in interdisciplinary teams to explore edible wild and weed species available in Montana (which has a temperate continental climate); develop a recipe featuring at least two of these species; identify and gather the selected plants; create and deliver an oral presentation on the ecology, nutritional value, and potential uses of these plants; and prepare the dish during the final class of the semester. Since each team prepares a different course, such as a soup, salad, entrée, or dessert, the final class transformed into a "feast," where students sampled the dishes in a festive dinner setting while learning from their peers' presentations.

Students were free to select the edible weeds at the core of their projects. Commonly selected species in this assignment included purslane (*Portulaca oleracea*), redroot pigweed (*Amaranthus retroflexus*), lambsquarters (*Chenopodium album*), common mallow (*Malva neglecta*), dandelion (*Taraxacum officinale*), chickweed (*Stellaria media*), and Canada thistle (*Cirsium arvense*), among others. The Gallatin Valley, the site of this study, is part of the traditional homelands of several Indigenous nations, such as the Crow, Shoshone, Sioux, and Blackfeet. Although documentation specific to this valley is not available, these nations are known to have gathered the plant species described above in other areas (Smith, 2023).

The Edible Weeds Feast at MSU exists since 2022. After the 2023 and 2024 editions, we conducted surveys and focus group interviews to assess how students perceived the impact of the event on their knowledge and to obtain overall feedback on the concept of edible weeds, and the structure and organization of the assignment. We sought to evaluate how an experiential, interdisciplinary assignment centered on edible weeds influences students' understanding of agroecological, nutritional, and cultural dimensions of weed species. We hypothesized that engaging directly with edible weeds, from field collection to culinary preparation, would enhance students' integrative learning and provide evidence for the value of including edible weeds in pedagogies for agroecology and food systems higher education.

2 Applied research methods

2.1 Assignment

We present the findings from a post-intervention student assessment of the Edible Weeds Feast. Undergraduate students from two MSU academic programs participated in this assignment: Students of the course SFBS 327, Ethnobotany, of the BS program in Sustainable Food and Bioenergy Systems, and students of the course ENSC 443, Weed Ecology and Management (hereof "Weed Ecology"), primarily of the BS program in Environmental Sciences and Crop Production. While the Edible Weeds Feast was a mandatory assignment for Ethnobotany students, participation for Weed Ecology students was optional.

In both courses, the assignment was first introduced in a lecture where the concept and local examples of edible weeds were presented. The learning outcomes, instructions, and procedures for the assignment were consistent across both years (see Annex 1 for the 2024 assignment instructions). Student teams were assigned by instructors. In 2023, all four teams were composed of students from both courses (a total of 16 students from Ethnobotany and 13 from Weed Ecology). In 2024, due to a scheduling issue, 8 Weed Ecology students formed a single team, while 17 Ethnobotany students were divided into four teams. The instructions were consistent across years and groups.

Each group created a recipe for a specific dish—salad, soup, entrée, or dessert—that incorporated edible weeds collected by the students, supplemented with local produce and other ingredients when available. After selecting the edible weed species for their dish, each group was responsible for identifying an appropriate location for gathering the plants. Locations, preferably organic crop fields, were required to be free of pesticides and distanced from roads. The instructors of the two courses and their assistants were available for support regarding plant identification and nutritional properties (including potential health concerns) of the selected weeds. Prior to processing them in the kitchen, the instructors verified the gathered plants in terms of their accurate identification and actual edibility. Given the limited availability of weeds during the cool, late-fall weather conditions in Montana, the instructional team also offered to cultivate selected edible weed species in the greenhouse. To complement the ingredients for their dishes, each team was provided with a limited budget for purchasing additional ingredients needed for their recipes. Students were encouraged to use locally-grown ingredients. Produce from the campus student farm was also offered.

In addition to designing and preparing their assigned course, each team was required to deliver a 7–10-min oral presentation on the day of the feast, scheduled between the cooking activities and the meal. In the talk, students covered their recipe and ingredients, their incentives for choosing this recipe, the nutritional and health properties of the included weeds, the management challenges of the selected species, their role and abundance in Montana's agroecosystems, as well as their cultural significance.

On the day of the feast, the teams prepared the meals in a fully-equipped MSU commercial kitchen under the supervision of its manager and chef. The teams had one hour to complete their assigned courses. After the dishes were finished, all students gathered for the oral presentations and enjoyed the prepared food.

2.2 Data collection

To obtain student feedback, we administered a post-intervention online survey to all participating students immediately after the feast activity concluded. In addition, in 2025, we conducted a series of focus group interviews with selected students who had participated in the feast in 2023 and 2024. For both methods, we obtained Human Subjects Research Exemption from the MSU Internal Review Board (IRB# 2024-1927). Accordingly, informed consent was obtained from all participants prior to their involvement in the survey and focus group discussions.

2.2.1 Surveys

We developed a structured online survey using Qualtrics XM Survey Platform (Qualtrics, Provo, UT). The survey included one demographic item and three content-specific questions: two employing a Likert-scale response format and one open-ended question (see Annex 2 for full questionnaire). The demographic question asked students to specify their program of study. The first Likert-scale question (five-point scale) was presented as a matrix of nine items assessing the extent to which the activity enhanced students' knowledge in specific areas, including weed and plant ecology, nutritional and health benefits of wild plants, food preparation, and local food systems. The second Likert-scale question (five-point scale) asked students to rate the overall benefit of the experiential assignment, and the open-ended question requested additional feedback on their experience. The survey was administered to all students participating in the Edible Weeds Feast because this group constitutes the entire population of students exposed to the assignment. As no additional students outside this cohort engaged with the intervention and the number of participants was low (2023: 29, 2024: 25), a full-population survey was both methodologically appropriate and necessary to capture the complete range of participant experiences (Braun et al., 2008). We obtained complete validated responses from a total of 17 students in 2023 (10 from the Ethnobotany course, 7 from Weed Ecology, response rate of 65%) and 22 students in 2024 (14 Ethnobotany, 8 Weed Ecology, response rate of 88%). Because participation in the Edible Weeds Feast was optional in Weed Ecology, the sample may be subject to self-selection bias. Students who elected to participate may differ from non-participants, for example, in motivation, interest in cooking and outdoor activities, or willingness to engage in experiential learning. Although such self-selection bias is frequent in educational research (Liu and Borden, 2019), we acknowledge that our sample may overrepresent students who were already predisposed to view the assignment positively.

2.2.2 Interviews

In Spring 2025, two focus groups were conducted to obtain in-depth student feedback on the experiential assignment. The first focus group consisted of three students from the 2023 cohort (one from Weed Ecology and two from Ethnobotany), and the second consisted of three students from the 2024 cohort (two from Weed Ecology and one from Ethnobotany). Each session lasted approximately 60 min and was held in a classroom setting on campus. A semi-structured protocol (Krueger and Casey, 2002) guided the discussion through open-ended questions. Topics included students' initial expectations regarding the event, the preparatory process leading to it, the organization of the feast, suggestions for improvement, the perceived impact of the assignment on students' understanding of edible weeds, application of the knowledge gained, experiences regarding the collaboration with students from another course, and the overall concept of edible weeds.

The interviews were audio-recorded, for which all participants provided informed consent. To incentivize engagement, lunch and beverages were provided. Each session was moderated by a member of the instructional team with prior experience in qualitative interviewing, while a second facilitator managed logistics and audio recording.

2.3 Data analysis

2.3.1 Survey data analysis

We performed survey data analysis and visualizations in R Studio (R Core Team, 2016), following the protocol of Menalled et al. (2024). For data visualization, we used the ggplot2 package (Wickham, 2016) in R. Variance analysis was conducted to assess differences between students' study programs and year of participation. A compact letter display, a post-hoc method based on Tukey contrasts, was then applied using the multcomp package to visualize pairwise differences across survey questions (Hothorn et al., 2008) and "emmeans" (Lenth, 2023). To evaluate the correlation between students' overall perception of the assignment, their course enrollment (Ethnobotany vs. Weed Ecology), and perceived learning gains in specific domains, we used Kendall's τ_β correlation analysis with the DescTools package (Signorell et al., 2024). Given the small sample size in our analysis, we grouped Likert-scales 5 ("strongly agree") and 4 ("somewhat agree") to the single scale "agree," and Likert-scales 1 ("strongly disagree") and 2 ("somewhat disagree") to "disagree," respectively.

We initially coded the open-ended survey responses by sentiment as negative, positive, or neutral. We classified responses indicating dissatisfaction, suggestions for improvement, or expressions of displeasure as negative; we counted responses reflecting satisfaction, accomplishment, or positive affect as positive; and we categorized responses containing factual or practical observations without an emotional component as neutral. We then analyzed the responses using conventional content analysis (Leech and Onwuegbuzie, 2011). Core themes were identified across the dataset, with one theme further subdivided into subthemes to capture nuance. Only 27 of the 39 surveyed students responded the optional open-ended question, so it was pooled across both years and analyzed.

2.3.2 Interview data analysis

We transcribed audio recordings from the focus groups verbatim using Microsoft Word (Microsoft Corporation, Redmond, WA) and automated transcription generated through Webex Meetings (Cisco Systems, San Jose, CA). We compared each transcript with the original audio to ensure accuracy and completeness. We also recorded notable nonverbal utterances when relevant.

We performed content analysis using NVivo (QSR International, Burlington, MA). Transcripts and open-ended survey responses were imported into NVivo, and we systematically coded the data to identify recurring themes and subthemes. We coded iteratively, with codes refined through discussion among the research team (Saldana, 2021). Consistent with the analysis of the open-ended survey responses, we classified direct feedback on the assignment as positive, negative, or neutral, using the same distinction criteria as described in 2.3.1.

3 Results

3.1 Surveys

The overall student assessment of the Edible Weeds Feast was not affected by their program of study or the year of participation (Table 1). All surveyed students agreed that they benefited from the experiential assignment (Figure 1). Agreement was highest for the learning outcome of increased knowledge of the nutritional benefits of wild plants and edible weeds (100%), whereas 72% of students, the lowest agreement rate, reported enhanced knowledge in plant identification (Figure 1).

For Weed Ecology participants, perceived increases in knowledge across specific domains were not correlated with their overall assessment of the event (all τ_β values >0.05; Table 2). Ethnobotany students' responses, however, showed positive correlations between their overall

TABLE 1 ANOVA results for survey response differences as function of survey question, program of study, and year of participation in the Edible Weeds Feast.

Source of variation	df	*p*-value
Question	9	<0.0001
Program	1	0.4
Year	1	1

Fixed effects for question, program, and year were included in the model.

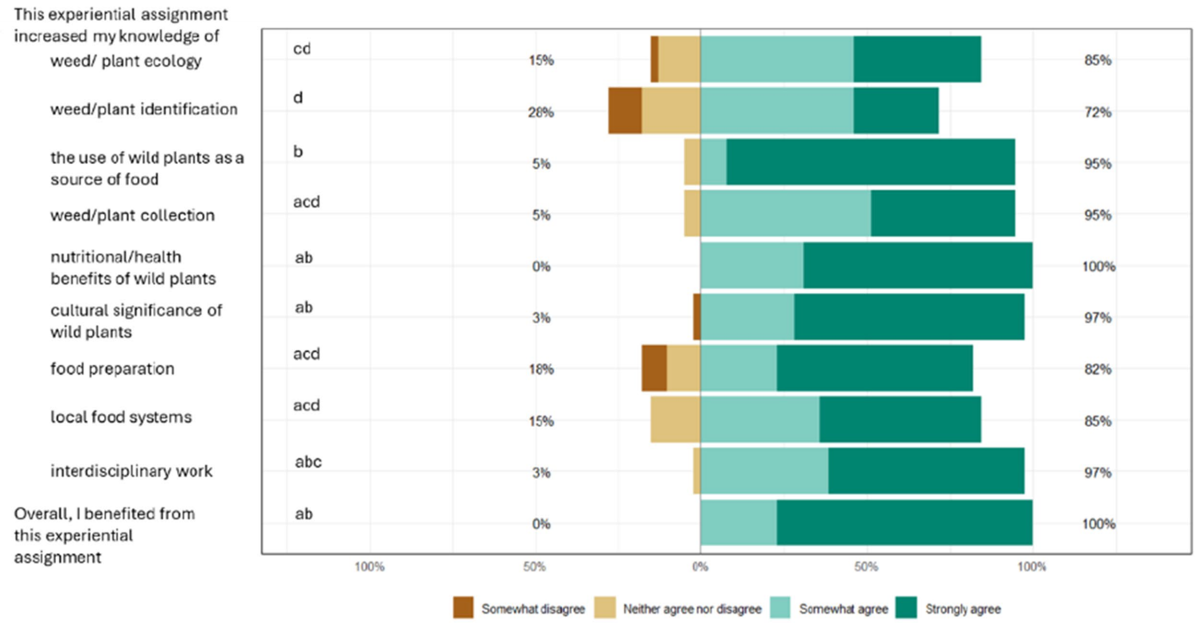

FIGURE 1
Student survey responses assessing the pedagogical outcomes of the edible weed feast, and differences (Tukey CLD) among survey questions on the overall assignment evaluation and learning gains in specific domains.

evaluation of the activity and perceived increases in knowledge of weed/plant identification ($\tau_\beta = 0.56$, $p < 0.01$) and food preparation ($\tau_\beta = 0.76$, $p < 0.001$). These findings indicate that students who reported learning gains in these two areas were more likely to provide a positive overall assessment ("strongly agree") of the assignment.

All participants who responded to the open-ended questions reported benefiting from the Edible Weeds Feast assignment and enjoying the activity (Table 3).

> *It was so different than any other project I have done and will be a standout memory when I look back on my time at MSU.*

Study participant on the nutritional potential of edible weeds.

Positive survey comments predominated the culinary experience and the prepared food which one student called "bomb" (jargon for outstanding). In contrast, participants who commented on the assignment preparation provided mostly negative feedback. Accordingly, 86% of participants who addressed event timing indicated that scheduling the activity in December was inconvenient due to the challenge of gathering edible weeds in the winter.

> *The food was absolutely sensational! Each dish was packed with amazing flavors, and trying new ingredients and combinations was exciting, enjoyable, and unforgettable.*

Online survey response of a student on the flavor and diversity of food prepared during the Edible Weeds Feast.

> *I also liked how hands-on it was. It made the learning feel more real and engaging. It is definitely a unique way to end the semester, and I feel like I have gained something valuable from it. Overall, a great way to finish and reflect on everything we have learned.*

TABLE 2 Kendall's $\tau\beta$ correlations between domain-specific knowledge gains from the Edible Weeds Feast and students' overall learning evaluation, presented separately for Weed Ecology and Ethnobotany students.

Knowledge domain (This experiential assignment increased my knowledge of …)	Weed ecology students		Ethnobotany students	
	$\tau\beta$	*p*-value	$\tau\beta$	*p*-value
Weed/plant ecology	0.33	0.15	0.36	0.09
Weed/plant identification	−0.05	0.8	0.56	0.007
Use of wild plants as source of food	−0.14	0.5	—*	—*
Weed/plant collection	0.22	0.4	0.035	0.9
Nutritional/health benefits of wild plants	0.30	0.2	0.02	0.9
Cultural significance of wild plants	−0.17	0.5	0.18	0.4
Food preparation	0.15	0.5	0.76	0.0004
Local food systems	−0.02	0.9	0.28	0.2
Interdisciplinary work	0.22	0.4	0.18	0.4

*No variation in the sample.
Likert-scale items ranged from 1 (Strongly Agree) to 5 (Strongly Disagree).

Study participant on the experiential nature of the assignment and its perceived learning outcomes.

TABLE 3 Student feedback themes and sentiment (positive, negative, neutral) from open-ended survey question.

Identified themes	Positive (%)	Negative (%)	Neutral (%)	*n**
Overall assignment and event	100			21
Culinary experience	100			2
Activity preparation throughout semester		100		2
Scheduling of event	14	86		7
Class integration and pedagogical background	100			1
Basic understanding of edible weeds	100			6

*Out of 39 surveyed participants.

3.2 Interviews

We identified 14 themes through content analysis, which fell under three main categories: (1) edible weeds, (2) experiential assignment, and (3) class integration and pedagogical background (Table 4). Three themes fell under edible weeds and nine were included in experiential assignment.

The interviewed students did not question the concept of edible weeds per se. Most of their respective observations were factual and neutral (80%), though thoughtful: "[The edible weeds concept] calls into question the very definition of a weed," articulated one student, while another one found the concept of edible weeds "paradoxical," since these plants "are often regarded as working against the desired crop, which is typically an edible plant." Interviewed students frequently expressed appreciation for learning about edible weeds. Specifically, 50% of statements regarding the dietary potential and significance of these plants were positive.

> *There are lots of things we do not eat because they are not sold in our grocery stores. Almost everything around us can be a food source.*

Study participant on the nutritional potential of edible weeds.

As for the actual experiential assignment and its final event, the Edible Weeds Feast, 75% of student comments were positive, and participants explicitly expressed having enjoyed the activity. Regarding the final event structure and organization, 67% of students expressed positive opinions. One student appreciated "eating together, as it symbolizes the importance of food and where food comes from," during what another student describes as an "incredibly enjoyable event." The interviewed students also made suggestions for improvement, for example guided questions or conversation starters while eating the dinner "to encourage more meaningful conversations." The students further recommended to schedule the team presentations during and not before the dinner. Under the culinary experience category, 100% of comments were positive, with students having enjoyed the food they had prepared.

> *Food was super flavorful, and then they did a blended squash soup with the broth. Marinated root broth as the base. It was so good.*

Study participant on the food served during the Edible Weeds Feast.

We received negative feedback on the preparation of the dinner event. Three out of four comments in this category were critical, with students requesting more explicit instructions and more interaction with faculty members prior to the feast. These perceptions were particularly strong on the plant gathering required to source the edible weeds, which students appreciated, as it increased their awareness of the food sources "available to us even in the winter." However, they claimed a lack of guidance by the faculty team. Students also articulated challenges in their teamwork, for instance lack of communication among team members. Aligned with the open-ended survey responses, the timing of the event at the end of the semester was criticized by all students.

4 Discussion

Students benefited from their participation in the Edible Weeds Feast, with the greatest perceived knowledge gains in the nutritional benefits of wild plants and edible weeds. A smaller gain perceived by students was in plant identification. Overall, the Edible Weed Feast obtained a positive assessment. This underlines that teaching about and with food facilitates meaningful learning outcomes, because food is deeply personal (Migliorini et al., 2020). The positive feedback our students gave us is particularly meaningful as this assessment did not differ between Ethnobotany students with a Food Systems background and Weed Ecology students with a conventional agricultural education.

Despite these similarities, perceived gains in plant identification and food preparation strongly influenced Ethnobotany students' overall satisfaction, while for Weed Ecology students, their positive evaluation reflected a general appreciation of the format rather than domain-specific gains. This may point to the fact that food systems education is typically grounded in experiential, interdisciplinary assignments (Ebel et al., 2022; Jordan et al., 2023), which is certainly the case for the Sustainable Food Systems program at MSU (Stein, 2025), making this type of assignment more novel for the Weed Ecology students. Most Weed Ecology students had also already taken one or more courses on general biology and crop production, where the topic of plant identification was introduced.

In addition to the perceived knowledge gains, open-ended survey responses and our focus group interviews indicated that students enjoyed the assignment, including working with edible weeds, developing recipes, and preparing the festive dinner. Most importantly, students acquired knowledge about edible weeds, with a significant portion noting that the experience opened their minds to a topic that many had not previously considered. This is not surprising: on the one hand, students, like anyone else, are continually exposed to a conventional agriculture paradigm that

TABLE 4 Categories and subcategories identified in focus group discussions on the Edible Weeds Feast and its course integration (results based on content analysis of semi-structured interviews).

Focus group content category and subcategory	Median coded units per participant and (sub)category	Positive (%)	Negative (%)	Neutral (%)	*n**
Edible weeds					
Basic understanding	2.5	20		80	5
Access and dietary significance	2	50		50	4
Concept discovery and exposure	6	100			6
Assignment implementation					
Assignment in general	2.5	75	25		4
Preparation	2.5	25	75		4
Plant gathering	1	20	40	40	5
Recipe development	2	100			4
Event structure	2.5	67	33		6
Culinary experience	1	100			4
Oral presentations	3	33	67		3
Teamwork and participation	2	17	83		6
Scheduling of event	1		100		6
Integration of assignment in courses and curricula	6	50	50		6

*Out of six focus group participants.

prioritizes chemical inputs to maximize yields of marketable commodities (Kremen et al., 2012; Migliorini et al., 2020); under this worldview, eating weeds is, if at all, perceived an "alternative" attitude (Rasmussen and Kaltoft, 2003). On the other hand, even critical students are rarely exempt from commodity fetishism and typically consider food an object that needs to be purchased in the marketplace and is disconnected from the socio-environmental conditions that make its consumption possible (Galt et al., 2013; Cluley and Dunne, 2012); gathering spontaneously growing plants contradicts market ideology and brand obsession.

Students particularly valued the experiential format of the assignment, noting that the enjoyment of the event enhanced their learning. This observation aligns with Burch et al.'s (2019) meta-analysis, which demonstrated that across disciplines and institutions, courses employing experiential pedagogies consistently achieve higher learning outcomes than those relying on traditional instructional approaches. Experiential formats give learners a sense of comfort and ownership, since knowledge is constructed from a union of experienced actions, feelings, and thoughts (Novak, 2010). The positive student feedback for this and similar pedagogical interventions in agroecology and food systems (Francis et al., 2011; Nordstrom et al., 2022; Hilimire et al., 2014; Parr and Trexler, 2011; Reeve et al., 2014), suggest that an experiential approach not only enhances students' learning as individual classroom activity, but should be integrated vertically across the curricula of these programs (Ebel et al., 2020; Spence and McDonald, 2015), being required in all courses where it fits learning outcomes.

Edible Weeds Feast participants further emphasized how the assignment format provided an effective way to consolidate and reflect on the knowledge gained throughout the semester. We suggest that combining the experiential task of cooking the edible weeds with having students delivering an oral presentation on this topic contributed to this perception, an approach that has been successfully applied in experiential assignments in agroecology courses (Francis et al., 2012).

The assignment also created an opportunity for interdisciplinary learning. By working in teams of Ethnobotany and Weed Ecology students, participants were exposed to diverse perspectives, challenging them to communicate across levels of experience and understanding (Goerss, 1996; Pennington, 2016). For example, Weed Ecology students learned to consider the cultural and nutritional value of plants they might otherwise seek to eradicate, while food systems students were introduced to management practices that shape plant communities and influence food access. This collaborative, interdisciplinary setting reflects the challenges students are likely to encounter in their future careers, where addressing complex agricultural and food system issues will require collaboration with stakeholders from diverse backgrounds and areas of expertise (Widener and Karides, 2014).

Students criticized specific aspects of the organization of the event. In this regard, most students commented on (1) challenges of teamwork in a setting where students were encouraged to organize themselves to gather plants, develop recipes, and prepare the oral presentation; (2) the timing of the presentations which occurred after cooking the feast but before enjoying dinner; and (3) the scheduling of the Feast itself in December, when low temperatures and snow limit the availability of edible weeds in Montana. These comments suggest that while encouraging self-organization in team activities is acknowledged as a challenge for instructors across disciplines (Strom and Strom, 1999), the instructor team needs to identify a pathway to make the organization of the assignment more effective. As of 2025, the oral presentations are held during, not before the dinner, and students receive assignment instructions in August, at the beginning of the Fall term, to have 4 months to collect the edible weeds for the event, still held in December.

5 Outlook

We share the positive student feedback on our Edible Weeds Feast with the wider food systems community, as this assignment could be adapted in similar programs and courses that seek to enhance deep experiential and interdisciplinary learning. Edible weeds, when integrated into food systems and agricultural curricula, encourage students to critically question the very concept of a weed and to develop creative strategies for their management and use (Stein, 2025). The activity further highlights the potential of unconventional resources in agroecosystems, with weeds potentially damaging crops but contributing to biodiversity and enhancing the resilience of production systems, while positively affecting dietary choices (Ebel and Menalled, 2025). Beyond edible weeds, the assignment format itself can be adapted to a wide range of contexts while still advancing interdisciplinary learning through experiential tasks, ultimately helping to prepare community members and future stakeholders capable of addressing the complexities of contemporary food systems (Valley et al., 2018).

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by MSU Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

LB-O: Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. EK: Investigation, Writing – original draft, Writing – review & editing. SL: Investigation, Writing – original draft, Writing – review & editing. FM: Project administration, Supervision, Writing – original draft, Writing – review & editing. RE: Conceptualization, Funding acquisition, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing.

Funding

The author(s) declared that financial support was received for this work and/or its publication. The Department of Food Systems Nutrition and Kinesiology at Montana State University provided funding for the Edible Weeds Feast events. Our research on its impact on students did not receive additional funding.

Acknowledgments

We acknowledge the Culinary Arts program with the Gallatin College at Montana State University for the kitchen space and tools used in the Edible Weeds Feasts and, specifically, Chef Michael Dean for his advice and flexibility. We thank our students for their passion for this topic and their willingness to provide feedback on the event.

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsufs.2025.1715791/full#supplementary-material

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