

PARTICIPANTS' SHARED PERSPECTIVES ON A SEASON-LONG AVALANCHE COURSE

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ABSTRACT: What would we find if we dug up what learners think they walk away with after an avalanche course and not just what instructors thought? Often the story of avalanche course learning is reported in terms of content covered, performance checks in an “course” environment and self-evaluating tests/questionnaires based upon preset learning goals. All of these are grounded in the perspective of avalanche course providers, researchers, and instructors. What else could we learn if we asked participants to report what they learn on their own terms, as experts on their own learning? Ten backcountry skiers and snowboarders with little formal avalanche education (2 women and 8 men, 25-68 years old) participated in a season-long, 11-day avalanche course (January-May 2023) with two avalanche course instructors and a participant observer skier. The season-long course was designed to facilitate conceptual and practical learning, in part, through active reflection on participants' experiences. One year later, eight of the ten participants returned for two more days on the mountain to ski together as peers. Two weeks afterwards, the participants gathered to discuss what they had learned through stories told to each other. This inquiry-based conversation is a method that focuses on uncovering what people think and feel about a topic. It is a curiosity-driven approach that poses questions to evoke participant thoughts and develop an understanding of the reasons behind them. We explain the method and report resultant themes from the big lessons participants report taking away from the course. We report the recommendations they have for future avalanche course development.

KEYWORDS: Reflection-based learning, Reflective practitioner, User involvement, Inquiry-based conversation, Avalanche course.

HIGHLIGHTS

- ❖ *Learning should be structured and accessible.* Participants emphasize the need for a structured, systematic approach to avalanche education, with a focus on reducing barriers (like costs) and promoting active participation and continuous learning.
- ❖ *Ongoing learning is enhanced by shifting relevance and reflection.* Current mountain conditions vary over time. Linking learning to those changes and reflecting on how to manage that strengthens learning and the improves ability to use what has been learned in new situations.
- ❖ *Customization and practical experience are important.* Participants expressed a strong preference for customized avalanche courses that include skill prerequisites, smaller groups, hands-on experiences, and modular structures.
- ❖ *Inquiry-based and reflection-based learning are valuable approaches.* Inquiry-based conversations and reflection-based learning helped deepen participant understanding of complex concepts like uncertainty and risk in avalanche education.

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1. INTRODUCTION

What would we find if we probed what learners think they walk away with after an avalanche course and not just what instructors presumed they did? Evaluations are designed for this purpose, though the questions – even the open-ended ones – are typically posed on the instructors' terms and are most often used directly after a learning event or course. What if we probed participant learning more on participant terms (e.g., Dahl et al., 2013; McCrea, 2012) one year later? What might we learn about what they remember from the course and how they make sense of it and use it? What themes might emerge, and what value might those reflections have for how avalanche instructors understand and design their courses?

1.1 *Memory and Learning*

It's important to remember that memories are not typically recalled exactly the same way people report experiencing them in the moment (Hetland et al., 2018). Rather, our memories are reconstructed descriptions of reality and often leave out, add or distort what happened then-and-there based on our prior experiences, what we noticed in the moment and experiences we have had since (e.g., Shing et al., 2016). Furthermore, we can't remember everything, so we are more inclined to remember what interests us (Schiefele et al., 1996) or makes sense to how we think of ourselves (Conway, 2005). Accordingly, from a shared moment or event neither the experience nor its memory will be the same across participants (e.g., Marsh, 2007). These idiosyncrasies affect what and how we take away (i.e., learn) from any given moment or event. Furthermore, memory can be performative, such that what we recall, and report having learned, individually and in groups who shared the experience with us, may also vary (Harris et al., 2008).

So, how can we gather both here-and-now and one-year-later course perspectives from participants, and what can we learn from that? This paper will focus on what a group of course participants report having learned and recommend for future avalanche courses one year after taking a research-based, co-created avalanche course in Tromsø, Norway.

1.2 *Avalanche Course Content and Structure*

The season-long avalanche course was designed to facilitate conceptual and practical learning, in part, through active, personal reflection on participants' experiences. There was no course fee, though those who agreed to participate agreed to take part in interviews, answer surveys and agreed to be observed.

The course was structured around a modular framework consisting of eleven practical days, divided into

six modules. Beginning in January 2023, with additional modules in February and March, the initial session focused on introductions and a preliminary outing (baseline trip) to observe the group's behavior in potentially hazardous terrain. Each following module included two practical days, with one day reserved for indoor learning due to adverse weather conditions. This setup allowed for an in-depth exploration of snowpack analysis, terrain choice, group dynamics, companion rescue, and trip planning.

The first four modules of the course followed the curriculum standards set by the Norwegian Mountain Forum (Norsk Fjellsportforum, 2018) for Level 1 and Level 2 avalanche courses. Participants were later invited back for two consecutive modules (each two days) in April and May 2023, where they applied what they had learned / understood by planning and executing the two ski touring trips as a group.

One year later, eight of the ten participants returned for a follow-up module of two more days on the mountain to ski together as peers, to assess how much they remembered and / understood from the previous year and how effectively they could implement their knowledge in practice.

During modules 1 and 2 the choice of learning environment and terrain was determined by the instructors. For modules 3 and 4 trip choices were made collaboratively and were decided solely by the participants in all following modules, both during the season-long course and the following year.

A typical course day for participants ran from 8:30 am to 4 pm, including travel to the mountain, pre-trip briefings emphasizing various aspects of avalanche safety, the tour itself, and post-trip debriefings. For researchers and instructors, the day began with a safety briefing, followed by participation in the day's activities, and concluded with post-debrief writing down of observations. Participants completed questionnaires and engaged in reflective exercises after each module. They also filled out a skills survey after the first day (baseline trip), the final day of module four (after completing the NF level 2 curriculum), and after planning and completing a tour in avalanche terrain a year after the course. These activities supported the evaluation of learning outcomes and skill development. The researchers encouraged participants to complete surveys and questionnaires within 24 hours of finishing each module (see also Dassler et al., 2024).

The avalanche course participants were invited to gather two weeks after the 1-year follow-up modules to discuss what they had learned from the course. They did this by telling their own stories prompted by topic-neutral open-ended questions without the presence or prodding of the avalanche course instructors. The goal was to provide equal time to all participants to share their reflections, the opportunity to discuss

what came up, and finally, to make concrete recommendations for future avalanche course content.

2. METHOD

2.1 Participants and Data Sources

Ten backcountry skiers and snowboarders (2 women and 8 men between 25-68 years old) with little formal avalanche education participated in a season-long, 11-day avalanche course (January-May 2023) with two avalanche course instructors and a participant observer skier. They were also invited for a 1-year follow-up ski tour (see above).

One year later, all were invited to participate in a meeting conducted on MS Teams that would be recorded and transcribed, and then anonymized by the participant observer before being shared with the research team for analysis. We here present the analysis and findings of this inquiry-based conversation a year after the course and after the 1-year follow-up ski touring module.

2.2 Conversational Structure

Our method was inspired by an inquiry-based conversation (Lipman, 1980) based on the participants' experience of the course they took part in. The structure of the meeting was shared in the invitation so that people were aware of the format and knew what to prepare for, if they so chose. The announced format was followed closely during the meeting itself. The meeting started with five minutes for each participant to speak uninterrupted about what they have experienced during the course and otherwise wished to express about their experience. This reduced the chance of social loafing and collaborative inhibition – two factors in conversations that can limit the content and quantity of how much a person shares (Harris et al., 2008) Then, the conversation moved on to an open discussion that ended with reflections on what advice they would like to give for further avalanche course development in Norway. This was done without a designated narrator steering the conversation content since all participants had the same instructions for how the session was to proceed (Cuc et al., 2006).

2.3 Participant Conversation

The invitation said (translated from Norwegian to English by ChatUiT):

“Thank you for the day on the mountain and everything you have done for the Avalanche Course all the way from the start to the final pizza at UiT. We learn so much from you!

Will you join us for a bit more?

Everything you have contributed so far has been led by the Avalanche Course team. Now, you have the

opportunity to teach us what you feel you have gotten out of the course.

We floated the idea of having you join us at the International Snow Science Workshop (ISSW), September 23-29, 2024, in Tromsø with your own contribution about how you experienced the course. This would be a novel and highly relevant contribution for the community.

We have now given that idea more shape and invite you to a digital meeting to talk about your experience of the course and what you want to express about it. Participants will receive a 500 NOK gift card.

[The participant observer] has agreed to lead the conversation, and we suggest the following format: Five minutes for each participant to speak uninterrupted about what they have experienced during the course and otherwise wish to express about their experience. Then, an open discussion, and finally, a reflection on what advice you would like to give for further avalanche course development in Norway.

We will record the session, and then [the participant observer] will transcribe and anonymize the comments. Then, the avalanche course team will take the next step to analyze themes that emerge.

If we get enough participants to join, we will submit an abstract to ISSW. It would be great if it is accepted, but regardless, we will take what we learn and share it further with you at a later gathering about the whole project.”

Eight of the original course participants, including the participant observer, participated in the MS Teams meeting. They followed the prescribed format, gently led by the participant observer. The meeting lasted approximately 1 hour and 30 minutes.

2.4 Analysis

Analysis of the inquiry-based explorative self-led participant conversation was inspired by the collective qualitative analysis approach by Eggebø (2020), that is based on Braun and Clarke (2006) thematic analysis. Two researchers individually read through the translated discussion between the course participants in several rounds. In the first readthrough, each identified themes as they surfaced in the participants' discussion. The themes were both identified and defined. A few sentences were written as a definition to accompany each theme. In the second readthrough, the themes were applied as codes to code the discussion in its entirety. One researcher used Nvivo (Nvivo 14) coding program for this purpose, while the other coded by hand.

In the next step, the two researchers met for two analysis workshops and discussions to go through their individual identified themes, and compare their initial analysis – looking for overlaps, differences, and similarities. They summarized their findings for each

other, discussed discrepancies and convergences of themes. A third researcher also read the transcript and the final categories for validation, adding only minor revisions to the original categories. This iterative process, inspired by Srivastava and Hopwood (2009), produced the verified themes that are summarized in Figure 1.

3. RESULTS

3.1 Participant Experiences

All of the participants, both those who were often the most talkative in the group and those who tended to be more reserved, used their full five minutes to reflect on their take-aways from the avalanche course.

In each of their five minutes, many affirmed the ideas of those who spoke before them, though then used their opportunity to supplement those ideas with yet other ideas. The transcribed conversation therefore does not capture how many had each thought, but rather represents a group-specific range of thoughts.

Overarchingly, participants reported the need for equipment knowledge and the traditionally “hard skills” related to terrain, shoveling, companion rescue, and snowpack analysis. However, they also emphasized the need to focus on understanding and managing human skills where thinking and communication can be flawed and potentially compromise safety. The experience themes that emerged from the conversation are summarized in Figure 1).

Practical experience and application. This category focused on the hands-on, real-world experiences that participants had related to the learning and practicing of knowledge and skills related to tools and equipment, snow, tasks like digging and rescue, and the human side for learning (e.g., communication, emotions).

Time. This category focused on course duration, the timing of content elements, continuity and variation over time, and opportunities for repetition. Overall, participants expressed keen awareness of the role of time within and between learning modules as a key aid for learning. The season-long format of the course also made it possible to experience, reflect on and “digest” the learning in multiple and varying conditions.

Reflection. This category focused on the effort and value of making time to reflect on trip ideas, planning and initiation, experiences on the mountain, and the post-trip thoughts, feelings, actions, and learning. Participants had the opportunity to reflect during course days and through debriefs, multiple questionnaires and post-course focus groups. However, it was the use of the Reflectometer, a tool for reporting and stimulating reflection (see Fjellaksel et al., 2024), that participants repeatedly reported as a particularly learning-rich tool.

Active participation and growth. Having to fill out the Reflectometer after course days, doing homework in between sessions, and using time between course days to practice what was learned were all mentioned as important for staying continuously engaged with the course content and as crucial for understanding and retaining deep understandings of avalanche safety, developing personally and developing their identity as a skier.

The socio-ecological learning context. The human aspect of learning from peers and experts was focal for this category, along with the benefits and challenges that culture beyond the group and group dynamics within the group introduced to the learning process. This was affected by group size, perspective diversity and feelings and emotions related to working with or fitting into the group.

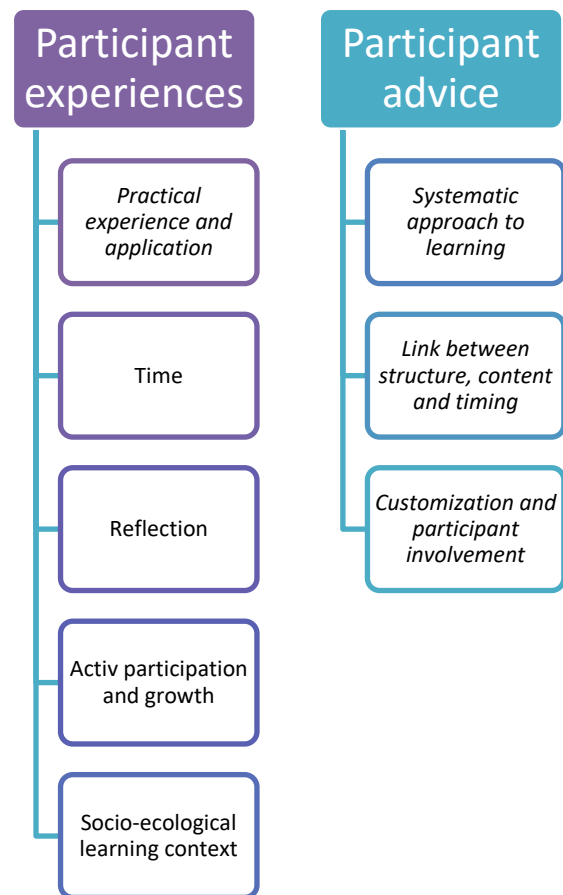


Figure 1: Overview of participant experience themes leading to participant advice.

It was reported that with other groups, some had become less comfortable with being the expert in the group after participating in this course, preferring to take on the role of a devil’s advocate who poses questions for all to consider rather than be the source of answers for the group. This aligns with the “why is it safe – enough?” approach (Landrø, 2021).

Acknowledging that this avalanche course varied from other courses in terms of its duration and structure, participation requirements, as well as how the instructors and participants co-created content and delivery goals as the course progressed, it is not surprising that much of what was shared reflected participants' thoughts about these deviations. Nevertheless, participants also reported learning from the deviations in ways that motivated specific suggestions for other avalanche courses. As such, they regarded the course deviations as more than curiosities.

3.2 Participant Recommendations for Future Avalanche Courses

The advice for future avalanche courses reflected the course experience themes, including Systematic approach, Link between structure and content, and Customization and participant involvement.

Systematic approach to learning. The systematic approach touched on the framework used to teach both the theoretical and practical components. Participants reported that the clear approach to facilitating the mastery of learning outcomes during the course helped them integrate and apply their learning more effectively.

Link between structure, content, and timing. Back to the topics of time, participants reflected extensively on course length and on module content, structures, and timing. They noted the value of opportunities to reflect and practice between sessions and the limits for that on Friday to Sunday weekend courses where learning goals are often many, and opportunities to practice, get feedback and reflect on their learning are substantially limited by time, group size and group composition.

Customization and participant involvement. The course was designed to include participant input in determining the content and structure of later modules. This flexibility allowed for individuals and the group to work on addressing specific learning needs. Participants found this both more effortful and valuable. Likewise, the more heterogeneous group (i.e., not a group of friends from before) also required them to take fewer things for granted about each other and be more reflective and intentional about how the group worked and how they developed as a group member – individually and in terms of how they came to regard their role in the group and how they regarded others and their roles.

A culminating suggestion from their conversation for future course development took what they regarded as the best of their course experience and integrated it into the structures already in use by other short course providers. They suggested course descriptions be clearer about prerequisites that will make taking any given course more effective for the participants who take it, and then dividing current three-day weekend courses into three-day courses over,

for example, several weeks. With this model, they suggested an intro day, then time to practice and reflect on their mastering of the introductory knowledge and skills on self-guided trips before a second course day two weeks later. After learning additional content, they suggested repeating the homework with reflection, and plan for additional practice on self-guided trips before the last course day a couple of weeks later. In this way, course instructors have more opportunity to monitor if what they teach is learned, and to give feedback where learning is suboptimal in subsequent sessions. It also opens the possibility of teaching in different snow conditions and managing potentially learning-rich “surprises” that may be solved for by using participants' newly learned knowledge or skills.

4. DISCUSSION

4.1 Reflections on the Efficacy of the Course and Improvement

Overall, course participants co-constructed memories of many of the key components in the course as it was designed by the instructors (TD, RF) (Coulpland, 2015). The modular framework was seen as a clear benefit of the course, as well as the balance between theoretical and practical skills and knowledge taught. In addition, participants highly appreciated the co-design element of the course involving them as active, knowledgeable creators of course content and structure. It was one of the design features that enabled the course participants to learn from multiple sources/perspectives and in multiple ways, addressing their learning needs, motivations and challenges. Even though specific content from individual modules was not mentioned, these broad brushstrokes about the learning process are rather impressive, for one year after the course ended.

The group also reported using some components of the course on their independent ski trips, being better aware of how to plan and execute trips and creating time to reflect on and analyze intense moments and events.

Since timing was such a pervasive topic, it is worth mentioning that other fields such as peace education, learning strategy and information literacy skill-building all experiment with how to optimize learning through intense “block teaching” (e.g., Muscat & Thomas), 2023 , providing timely content in smaller doses to optimize learning (e.g., Mees & Collins, 2024) or spaced practice (e.g., Smolen et al., 2016). Based on course participants' comments, they expressed a high regard for the experience of focused, timely content work with opportunities for practice and reflection in between.

Participants underscored the need for equipment knowledge and the traditionally “hard skills” related to terrain, digging, rescue, and snow analysis, but also

the need to focus on understanding and managing those skills where thinking and communication can be flawed and can compromise safety. Perhaps it is a misnomer to refer to the more static types of knowledge and skill as the “hard” skills of avalanche safety. Possibly equally hard, or harder, is managing the more dynamic qualities of changing environmental conditions and human complexity. These malleable factors matter for how safe choices have to be constantly made, monitored and adjusted until the trip is over.

Consider a spectrum in Figure 2 with static trip phenomena on the left side of the x-axis (the content that is often referred to as the “hard skills” content) and progressively more malleable trip phenomena on the right side (often referred to as “soft skills” content). Staying safe on the mountain involves dynamically attending to both the static and the malleable. This became increasingly evident to the participants during the course, though their level of personal interest in and skill with it varied.

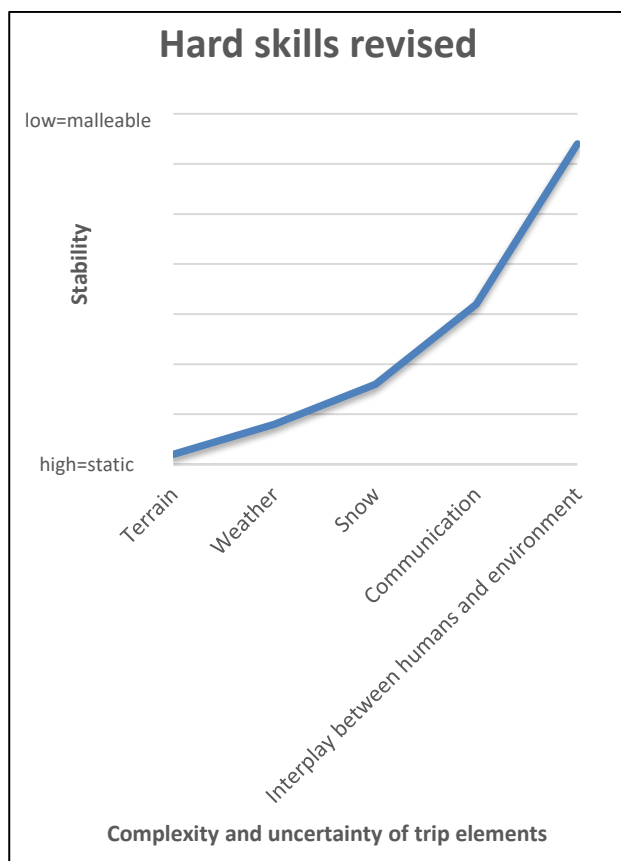


Figure 2: Visualization of the relation between the static and the malleable conditions participants need to learn to manage when making sense of and making decisions in the winter backcountry.

4.2 Implications

Related to learning, participant sense of time and acknowledgement of active participation *and* reflection as learning boosts stand out in this conversation. These aspects of the course form, content and structure are evidence-based and reportedly left lasting impressions on what participants know and report using on their ski trips.

The way this course was first offered and later co-developed with the participants can be practiced on a smaller scale, as the participants described at the end of their conversation. It would be interesting to learn how a smaller-scaled project of this kind would work for instructors and learners.

4.3 Limitations and Suggestions for Future Research

We acknowledge the small group that these data are based upon, and the limits to the method used. What the group remembers is not necessarily the same as what each individual remembers. Furthermore, these current reflections offer only part of the picture from a work in progress. In future analyses, these findings will be integrated with baseline and season-long observations of participants and with other forms of participant input. Only then will we be able to name any notable changes in their collective mountain savvy.

The matter of time. Participants reflected extensively on course length and on module content, structures, and timing. They noted the value of opportunities to reflect and practice between sessions and the limits for that on Friday to Sunday weekend courses where learning goals are often many, and opportunities to practice, get feedback and reflect on their learning are substantially limited by time, group size and group composition.

Customization and participant involvement. The course was designed to include participant input in determining the content and structure of later modules. This flexibility allowed for individuals and the group to work on addressing specific learning needs. Participants found this both more effortful and valuable. Likewise, the more heterogeneous group (i.e., not a group of friends from before) also required them to take fewer things for granted about each other and be more reflective and intentional about how the group worked and how they developed as a group member – individually and in terms of how they came to regard their role in the group and how they regarded others and their roles.

Suggestions. The group suggested course descriptions be clearer about prerequisites that will make taking any given course more effective for the participants who take it, and then dividing current three-day weekend courses into three-day courses over,

for example, several weeks. With this model, they suggested an intro day, then time to practice and reflect on their mastering of the introductory knowledge and skills on self-guided trips before a second course day two weeks later. After learning added content, they suggested repeating the homework with a reflection plan for additional practice on self-guided trips. Finally, a last course day three weeks later.

With this model, course instructors would have more opportunity to monitor if what they teach is learned, and to give feedback where learning is suboptimal in subsequent sessions. It also opens the possibility of teaching in different snow conditions and managing potentially learning-rich “surprises” that may be solved by using participants’ newly learned knowledge or skills.

5. CONCLUSION

“Time to reflect, time to change, time to learn!”

Firstly, a courses’ design that involves participants actively and facilitates time to digest and reflect on their learning experiences supports their personal learning journey. This seems to be especially true if done in a structured way, for example, through a modular course design over a longer period of time, that includes practical hands-on, as well as theoretical and reflection-based learning.

Secondly, traditional hard skills are not always the hardest things to learn and successfully implement in participants’ own touring practices. In many instances during this course, “soft skills” like the courage and skills required to speak up in group contexts and managing environmentally demanding settings were harder skills for many to master.

Thirdly, the course's socio-ecological context and active participation and opportunities to practice what they were learning was valued, i.e., being especially mindful of how to use time and reflection in how instructors prepare them to enjoy winter mountains safely.

Our take-home message from this work therefore is: Listen to your learners on their own terms. Marvel at how they sometimes see things the same way as you, and sometimes not. Use what you learn actively by taking your learners on as course collaborators -- simultaneously helping them learn better while becoming a better instructor, too.

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