Avalanche Beacon Parks: Skill Development and Team Coordination in a Technological Training Ground

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THE MESSAGE

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Technological training grounds can stimulate amateur practice in context.
Extreme sports

Balance between risk-taking and knowledge of dangers
Extreme sports

Start to include technological devices
Motivation

Growing need for practice and simulations for amateurs
Team training

Team training through simulations (air traffic control, health care, firefighting, real world emergencies)

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Disaster communities and emergency response (use of social media and virtual communities)

(e.g. Herranz et al., 2013; Sutherlin, 2013)

Non-experts and ad hoc teams
Team training

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Non-experts and ad hoc teams

On site and extremely fast
Case study: Backcountry Skiing

Out of bounds - No avalanche control - No ski patrol
Avalanche

A rapid flow of snow down a slope that can catch and bury skiers
Companion rescue

If a skier is caught, his companions need to rescue him IN 10 MINUTES
Beacons
Beacons
Beacons
Companion Rescue Challenges

1 - Understanding the beacon
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2 - Working as a team (distributed cognition and situational awareness)
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3 - Gaining relevant practice
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1 - Understanding the beacon

2 - Working as a team (distributed cognition and situational awareness)

3 - Gaining relevant practice

* Technology is only ONE facet

(Desjardins et al., 2014)
Avalanche Training Beacon Parks
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Research Questions

1- How do recreationists use beacon parks?

2- How can we design beacon parks to better fit the needs of the recreational community of backcountry skiers?
Methodology

Observations and Interviews

4 days at Mt Baker

Pre-activity questionnaire
Shadowing
Semi structured interviews

22 participants

10 general public

10 individuals
3 teams of 2
2 teams of 3
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Reflections

Written reports and photos

Desjardins: new recreationist

Hambelton: professional avalanche education specialist

Greenberg: experienced recreationist
Results - Individual skill development

Familiarizing themselves with beacon

Working on multiple burial scenes
Discussion - Progressive scale

Value of having a pre-installed training ground

Breaking the false sense of confidence
Results - Team coordination training

Beyond the beacon
Discussion - Balancing skill development and coordination training

Beacon park emphasizes the beacon itself

Encourage team coordination activities
Results - Setting up the beacon park

Physical constraints of the terrain
Results - Setting up the beacon park

Physical constraints of the terrain

“The beacon park is generally in a flat area, on snow that is easy to access and walk on. In a real avalanche, the terrain would be much steeper and walking in avalanche debris is more like walking on boulders. So this is not really realistic.” (P3c)
Discussion - Levels of fidelity

Use technological and psychological fidelity when environmental fidelity is hard to reach (Beaubien and Baker, 2004)
Results - Role of the facilitator

Orientation, feedback, debrief sessions
Results - Role of the facilitator

Orientation, feedback, debrief sessions

“Having [the beacon park] staffed also really helped, because when you have someone teach you, this makes a large difference.”  
(P10c)
Discussion - Supporting a community of practice

Presence of facilitator or mentors and Meet & Greet (structured clubs)
Conclusions - Technological training grounds

Non-experts and ad hoc situations

Other extreme sports and disaster relief

Less extreme situations, e.g. citizen science
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