Mechanisms of Learning Transfer in Adventure Education: Qualitative Results From the NOLS Transfer Survey

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Transfer of learning from adventure programs remains of critical interest to adventure education professionals. Although some research has investigated what transfers, notably less has focused on mechanisms that might influence transfer. This paper explores the mechanisms of transfer reported by a stratified random sample of National Outdoor Leadership School (NOLS) alumni. The 538 participants reported that instructors (through a variety of means), inherent qualities of the adventure courses (e.g., group dynamics, natural setting), and curriculum (e.g., leadership progression) were critical mechanisms of transfer. Some of the literature-based mechanisms were not evident in the data; however, some (e.g., active learning, feedback) are inherent in adventure education. Thus, adventure education programs may inherently foster learning transfer through a variety of both data- and literature-based means. Ultimately, learning transfer is complex and highly individual; astute adventure educators should intentionally use a wide spectrum of techniques and tools, ranging from group dynamics to curriculum, when considering transfer in adventure education.

Keywords: Learning Transfer, National Outdoor Leadership School (NOLS), Adventure Education

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Transfer of learning from adventure education programs remains a fundamental assumption of adventure education professionals (Wolfe & Samdahl, 2005). Despite the abundance and variety of outcome studies (e.g., Hattie, Marsh, Neill, & Richards, 1997), few studies have investigated the issue of learning transfer from adventure education settings. Those that have almost exclusively focus on the outcomes or content that transfers (e.g., Gass, Garvey, & Sugerman, 2003; Holman & McAvoy, 2004; Miller, 2001; Sibthorp, Paisley, Furman, & Gookin, 2008) rather than on the processes by which transfer occurs or the strategies that foster transfer.

Transfer mechanisms are specific variables that can affect the amount of transference that learners realize. Although evidence describing the influence of transfer mechanisms in adventure education is minimal (Gass & Priest, 2006; Leberman & Martin, 2004), there are significant bodies of literature in the fields of cognitive psychology, education, and human resource development (e.g., Barnett & Ceci, 2002; Cheng & Ho, 1997) that suggest ways that transfer may be increased. Baldwin and Ford (1988) summarized the breadth of learning transfer literature in a seminal work. These authors posit that transferable outcomes are a function of three main factors: the individual learner, the characteristics or design of the training, and the transfer context. Recently, Burke and Hutchins (2007) modified this structure slightly, suggesting that a framework involving (a) learner characteristics, (b) intervention design and delivery, and (c) application/workplace environment is responsible for facilitating transfer in learners.

Despite the obvious importance of the learner characteristics and the application or workplace environment to which skills will be transferred, most adventure programs have much greater influence over the actual training design and delivery through curricular and implementation decisions. In the transfer literature, and highly compatible with adventure education programs, several main training-oriented mechanisms are thought to influence transfer of learning: experiential or active learning, reflection, and feedback (e.g., Cox, 1997; Gardner & Korth, 1997); metaphor and analogical thinking (e.g., Mayer & Wittrock, 1996); overlearning (learning well beyond the point of initial skillfulness); and goal setting (e.g., Gass, 1999). Aside from general information, and some specific efforts around metaphor (e.g., Gass & Priest, 2006), little is known about how adventure educators might intentionally facilitate transfer. Therefore, the aim of this paper is to explore the specific

mechanisms adventure program participants attribute to learning transferable outcomes one to 10 years after program completion and to compare these findings with contemporary literature on transfer mechanisms.

Background

Within each of Burke and Hutchins's (2007) three general influences exist a number of specific transfer mechanisms that can ultimately facilitate transfer. But due to the nature and complexity of learning transfer, the literature review in this paper is not comprehensive. Although this may limit the scope of this paper for some adventure education programs and readers with different conceptualizations of learning transfer, it allows a focus on variables that are common to many programs and participants; it also illustrates the lens through which the authors of this paper view learning transfer. Further, the limited research addressing transfer mechanisms in adventure education is integrated with this general framework.

Learner Characteristics

Learner characteristics are those variables that students bring to the course. For instance, cognitive ability (Ree & Earles, 1991), personality (Herold, Davis, Fedor, & Parsons, 2002), and motivation (Chiaburu & Marinova, 2005) have been shown to influence transfer. Perceived utility of the training has also been shown to contribute to transfer (Baldwin & Ford, 1988; Ruona, Leimbach, Holton, & Bates, 2002). If the learner views the training as relevant to personal or career goals, he or she is more likely to transfer skills or knowledge. Perceived self-efficacy can also influence transfer (e.g., Ford, Smith, Weissbein, Gully, & Salas, 1998; Holladay & Quinones, 2003). Although many of these variables are clearly beyond the influence of programmers and instructors, an appreciation of their influence may help programs understand ways in which transfer can be maximized.

Intervention Design and Delivery

Intervention design and delivery mechanisms involve both content and instruction. Adventure programs may develop curriculum, for example, that involves students setting goals or developing action plans. Further, instructors can intentionally engage learners in overlearning exercises and provide content and context-specific feedback. Content and instruction, as program dimensions, certainly overlap and may positively influence learning transfer. The following discussion highlights the variety of mechanisms available to adventure education curriculum designers and instructors.

Several authors claim that having students develop their own learning goals can facilitate transfer (Gass, 1999; Taylor, Russ-Eft, & Chan,

2005; Wexley & Baldwin, 1986). Yorks, Lamm, and O'Neil (1999) suggest that instructors "can work with participants to develop goals prior to the start of an action learning program. Participants can be encouraged to reflect on these goals throughout the program and set subsequent goals for continuation of learning following the program" (p. 62). Action plans (Foxon, 1994; Yamnill & McLean, 2001) can also be used to identify how certain goals can be achieved and what variables might compromise their attainment.

Overlearning, or the mastery of skills past the point of initial competency (Burke & Hutchins, 2007), has an impact on transfer of learning. In addition, practice, directly related to overlearning, has been shown to lead to increased transfer (Donovan & Radosevich, 1999), as has the provision of feedback (Burke & Hutchins, 2007; Gardner & Korth, 1997; Simons, 1999; Yorks, Lamm, & O'Neil, 1999). Lee and Kahnweiler (2000) found that providing feedback to participants via direct interpersonal communication, reinforcement, and remediation opportunities resulted in significantly higher transfer scores on a specific work task.

Active learning techniques are thought to facilitate the transfer of learning (Cox, 1997; Mayer & Wittrock, 1996), perhaps because they maintain student attention more than passive forms of instruction (Burke & Hutchins, 2007). In general, active learning seems to lead to greater learning, which, in turn, leads to increased transfer (Haskell, 2001).

Several authors suggest that using metaphor and analogy can facilitate transfer (Alexander & Murphy, 1999; Mayer & Wittrock, 1996). Metaphor is linked to transfer because participants must apply what they know in one situation, assess similarities and differences between two situations, and then make a cognitive link to approximate the two. Specifically in the context of adventure education, Gass (1999) and Luckner and Nadler (1997) posit that intentional use of reflection activities involving metaphor can facilitate transfer of learning.

Behavior modeling, also called demonstration or role modeling, has been shown to increase transfer. Recently, Taylor and colleagues (2005) used meta-analytic techniques to examine 117 studies that incorporated behavioral modeling into the training. The researchers determined that a mixed model approach (where both effective and ineffective practices were role-modeled) was a successful way to facilitate learning transfer. Role modeling is commonly used in adventure education programs and has been shown to be an effective teaching technique (Paisley, Furman, Sibthorp, & Gookin, 2008).

Application or Workplace Environment

The final category of transfer influences involves characteristics of the environment in which learning is applied or to which learning is transferred. Recognizing that the application environment is outside

of an adventure program's direct sphere of influence, we feel it is still worthwhile to understand its potential impact so that program instructors might consider these important factors when they hope to facilitate learning transfer.

Multiple and complex factors play a part in determining whether or not a transfer climate is positive. Transfer climate may be considered the holistic, system-wide atmosphere that either encourages or discourages students to use the skills they have learned (Burke & Hutchins, 2007; Holton, Bates, & Ruona, 2002; Taylor, 1992). Within the transfer climate, specific elements such as supervisory support (Taylor, 1992) and peer support (Holton, Bates, Seyler, & Carvalho, 1997) influence transfer. In addition, having opportunities to perform new skills is an important factor in whether or not learning will transfer (Brinkerhoff & Montesino, 1995; Gaudine & Saks, 2004; Lim & Morris, 2006), as is accountability for using those skills (Brinkerhoff & Montesino, 1995).

Of the transfer influences described previously, intervention design and delivery is potentially the most malleable and relevant to adventure education practitioners. Therefore, the specific purpose of this study was to inductively explore specific transfer mechanisms to which a sample of National Outdoor Leadership School (NOLS) program participants attribute learning transferable outcomes one to 10 years after program completion.

Method

During the summer of 2007, a stratified random sample from the NOLS alumni database was invited to participate in the study. This sampling strategy was employed to provide a representative picture of NOLS alumni from 1997 to 2006. Alumni were stratified by year (1997–2006 alumni) and by course type: (a) semester courses, (b) courses for outdoor professionals, (c) "classic" (wilderness backpacking) courses, (d) adventure (youth ages 13–15) courses, and (e) courses for participants 23 or more years of age. Sixty alumni from each of the five course types for each of the 10 years were randomly selected from the alumni database. These 3,000 alumni were mailed an invitation to complete an online version of the survey instrument. In October of 2007, a reminder letter was sent to non-respondents, which included a hard copy of the instrument and a postage-paid envelope so participants who were unable or unwilling to complete the questionnaire online could still participate.

Data collection was closed in January of 2008. Data were cleaned and screened for univariate outliers, and participants not meeting the inclusion criteria were deleted from further analyses. To be included in the study, alumni must have completed only a single NOLS course between 1997 and 2006 (inclusive).

To assess potential non-response bias, 10 non-respondents from each of the five course types were contacted and asked, "Is there a particular reason that you did not return the recent questionnaire with the National Outdoor Leadership School?" Of the 50 individuals contacted, 23 replied they did not receive the questionnaire; 17 replied they received it but did not like to fill out questionnaires; and the 10 remaining non-respondents stated they intended to fill out the questionnaire but did not "get around to it." Non-respondents did indicate a negative bias.

The results from the quantitative portions of this questionnaire were reported in a previous manuscript (Sibthorp et al., 2008). The data reported in this paper focus on five open-ended questions intended to address transfer of learning in adventure education through the voice of the participants:

1. Of the things you learned while on your NOLS course, which one, in your opinion, is the most valuable to you today?

2. Why is this (answer to question 1) more valuable than the other things you were exposed to?

3. Please complete the following sentence: If it had not been for _____ on my course, I probably would not have learned nearly as much about this (answer to question 1).

4. Why was this (answer to question 3) important to your learning?

5. Is there anything you learned at NOLS that has negatively impacted your everyday life? If yes, what was it?

Data Analysis

In order to develop coding rules and themes while minimizing bias, 30 of the total responses were randomly pulled from the sample and used to develop the initial coding rules and themes. This random subset allowed two coders to individually explore the appropriateness of the themes by using a constant comparison technique (Maykut & Morehouse, 1994). Descriptors were then created to summarize the spirit of each theme. After coding the random sample, the coders discussed their individual codes and themes and further refined the themes and descriptors to best represent the data. When appropriate, themes for the first question (What transfers?) were the same themes that were developed in a previous study (Sibthorp et al., 2008). When participant responses did not clearly fit within these themes, adjustments were made to the themes to encapsulate the responses. In general, although this was an inductive approach to data analysis, it did not strictly adhere to a theoretical framework such as grounded theory.

Both researchers then independently coded the remaining data ($n = 508$), using the themes developed. Once completed, codes were

compared and an inter-rater agreement between the two coders was calculated. Inter-rater agreement for all five questions ranged from 0.98 to 1.0. Results were then enumerated for ease of presentation, using each participant's entire response as the unit of analysis. Participant responses to questions that were idiosyncratic and did not fit into the extant themes were not included in the results as they were not salient across the sample of responses.

Results

The sample included responses from 508 participants. Some participants were removed from specific analyses because they left a question blank, the coders could not agree on a code, or the response did not fit into a discernable theme (< 1% of the sample). The final sample was 52% male, averaged 31 years of age, and covered the full range of course years (1997–2006).

The qualitative coding for the first question showed that the most frequently reported lessons learned from NOLS and still valued were outdoor skills (19%), changes in life perspective (13%), appreciation for nature (11%), self-confidence (10%), ability to serve in a leadership role (10%), self-awareness (9%), ability to function under difficult circumstances (8%), and ability to work as a team member (5%). Only these eight themes, representing 5% each or more of the sample (approximately 83% of the total responses), are specifically examined in relation to the mechanisms of transfer. These transferable lessons were largely considered valuable (question 2) because they were relevant and applicable to the participants' lives. In addition, career and recreation goals were noted as reasons outdoor skills were important.

Regarding specific mechanisms that helped participants learn these lessons (question 3), instructors, group dynamics, hardships inherent in the NOLS courses, and the leadership progression (structured transfer of leadership from instructors to students) were the most frequently cited (see Figure 1). Instructors were noted 48% of the time across the top eight learning outcomes, but they were especially reported as important in learning transferable outdoor skills, an appreciation for nature, functioning under difficult circumstances, working as a team member, and leadership. Likewise, group dynamics were reported as important to a variety of outcomes (12% of total), notably self-awareness and working as a team member. Characteristics of the classroom (COC) that provided inherent hardships (10% of total) were cited as most responsible for learning how to function in difficult circumstances. The leadership progression (6% of total) was most commonly reported as responsible for learning leadership and self-confidence. Course highlights and the inspiring COC each were reported as the most important mechanism approximately 6% of the time.

Figure 1

*Top Transferable Lessons by Mechanism of Learning*
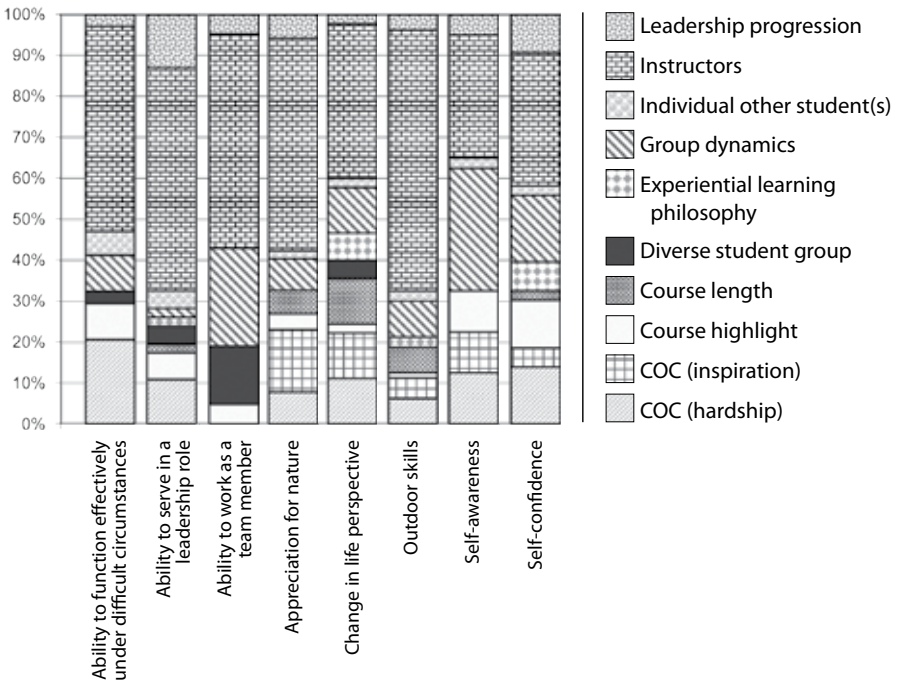
With respect to specific learning mechanisms being linked to specific outcomes, Figure 1 demonstrates that logical patterns exist within the data. For example, group dynamics, as a mechanism, was most noticeable in the transferable lessons of "ability to work as a team member" and "self-awareness." This makes sense as the group is essential to the development of teamwork and self-awareness is likely fostered by external feedback from and internal comparison to others. Also logically, "leadership progression" is most noticeable as fostering an "ability to serve in a leadership role" and "self-confidence."

A follow-up question (question 4) asked the participant to elaborate on why the above mechanism was important to the learning process. Instructors, as mechanisms, could largely be separated into categories as being curriculum delivery mechanisms (28%), role models (17%), agents of inspiration (15%); as having specific attributes or qualities that resonated with specific participants (14%); or as being generally supportive (13%). Figure 2, then, represents the variety of more specific tactics or characteristics demonstrated by instructors. Some of these certainly speak to malleable program factors, such as the instructor being a mechanism

for "curriculum delivery," meaning that the impact of the instructor was attributed to formal material or classes disseminated to students. Some are more personal and idiosyncratic to the individual instructors, such as "agent of inspiration," meaning that students simply wanted to be like their instructors based on a sense of awe. Of those who reported group dynamics as an important mechanism, more than half indicated the importance of the student group in creating its own learning environment.

Figure 2

Instructor-Based Transfer Mechanisms
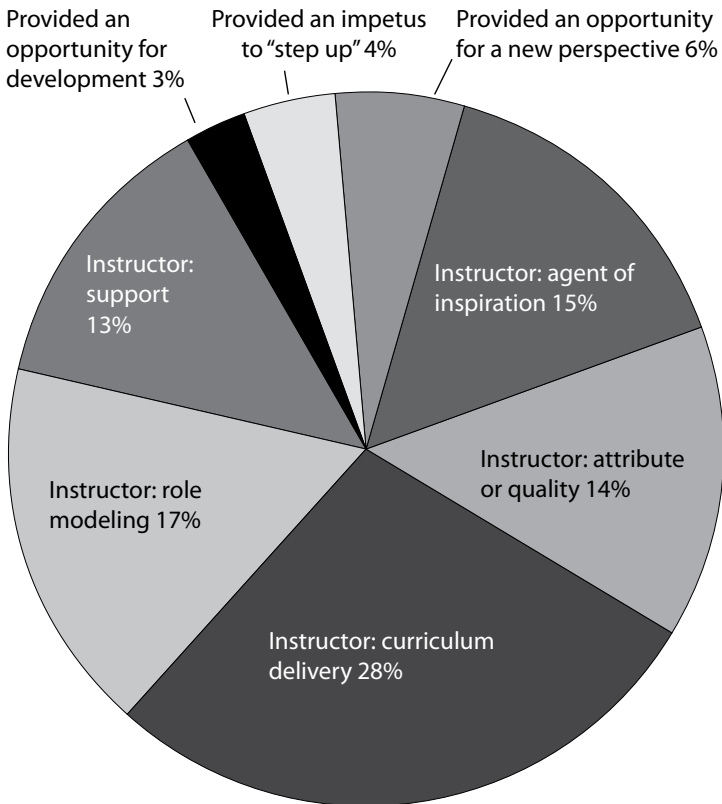
Regarding the fifth question about negative transfer or learning, 80% of participants reported no negative learning. Longing for the outdoors, some reflection about an unpleasant aspect of the course, and cognitive dissonance were the only substantive themes. The cognitive dissonance category represented irreconcilable inconsistencies between a NOLS expedition and post-course experiences. Many comments referenced either conservation values (e.g., minimal consumption of goods) or group be-

haviors (e.g., open and honest feedback) that were appreciated while on their NOLS course, but that were not realistic afterward. Although the study participants identified longing for the outdoors and cognitive dissonance as negatives, it is arguable that many outdoor educators would view these as positive outcomes.

Discussion

With respect to previous research, three patterns emerge that describe the relationship between our results and the general transfer mechanisms literature. First, there are several mechanisms that are explicitly noted in past literature that are consistent with our findings. Second, there are a number of mechanisms present in our data that are not necessarily reported in the contemporary transfer literature. Third, there are a number of mechanisms that literature suggests are transfer mechanisms, but were not reported by the research participants in this study. In addition, although not the primary purpose of this study, the results from the qualitative coding regarding what transfers largely supported the quantitative responses (Sibthorp et al., 2008) and previous literature on transferable lessons from adventure education programs (e.g., McAvoy, Holman, Goldenberg, & Klenowsky, 2006; Miller, 2001).

A number of the themes that emerged from these data are consistent with the contemporary transfer mechanisms literature, including content relevance, perceived value, career variables, behavioral modeling, and opportunity to perform. Often, participants simply mentioned that what they learned played an important part in their lives because it was relevant or transferable. In particular, ability to function under difficult circumstances, ability to serve in a leadership role, and change in life perspective were three notable outcomes that were identified as having transferred because they were relevant or transferable. This theme is consistent with both content relevance (Burke & Hutchins, 2007) and perceived value (Ruona et al., 2002).

Another transfer mechanism present in both the literature and our data is the opportunity to perform (Lim & Johnson, 2002). Often, participants noted they were able to use their skills to achieve general goals or goals specific to their recreation or career pursuits (cf. Ruona et al., 2002). In some cases, participants in our sample became outdoor educators after their NOLS courses; thus, the outdoor skills they learned transferred well. Other participants noted that they currently worked as managers or teachers, and that the leadership, communication, or conflict management skills they learned had transferred to these contexts. One participant stated, "I continue to use the teaching skills that I learned on my instructor course in my professional life, and teaching skills were certainly more emphasized than anything else on the course." Clarke

(2002) notes that limited opportunities to perform new skills on the job was the largest factor inhibiting transfer within a human service agency, reinforcing the "use it or lose it" adage. This is certainly a consideration for adventure education programs; some content may simply not apply to individuals living in an urban environment with little opportunity to use their new skills.

Of the five different instructor-based mechanisms in the data, only behavioral modeling was found within the literature (Taylor et al., 2005). The other four—agent of inspiration, curriculum delivery, attribute, or support—are transfer mechanisms not discussed in the general literature. It is possible that the intimate relationship between instructors and students in adventure education may act as a catalyst for transfer in ways that other forms of training may not be able to replicate. The importance of the instructor and the diversity of instructor-based transfer mechanisms lends support to the notion that hiring the "right" people is tremendously important, as is providing solid curriculum and training. (Both appear distinctly in these data.) In addition to certain instructor-based mechanisms, a variety of other mechanisms were also evident in the data, but were not explicitly linked to the transfer mechanisms literature.

Some transfer mechanisms in adventure education programs may simply be different than in other fields. Mechanisms reported as important—such as individual other students, group dynamics, and diverse student group—are probably related to the interactive, small-group model used in adventure education but are not present in a variety of other training contexts. Course highlights (e.g., summiting a peak), course length, and hardships and inspiration inherent in the outdoor "classroom" simply do not exist in typical educational settings. Finally, highly specific curricular approaches, such as the leadership progression at NOLS, are not even universally present across the variety of adventure education contexts.

Despite this possible disconnection with the literature on transfer mechanisms, many of these pedagogical tools are widely recognized as critical to student learning within adventure education. The importance of the physical and social environment on adventure education courses has long been recognized (e.g., Walsh & Golins, 1976). More recently, Paisley, Furman, Sibthorp, and Gookin (2008) report that both characteristics of the classroom (outdoor environment, in this case) and course highlights were responsible for student learning of some outcomes. The data from this study indicate that some of these widely accepted pedagogical tools in adventure education may facilitate both proximal learning and long-term transfer.

A number of factors consistent with the literature, yet not reported by our participants, are likely to have facilitated transfer. These mecha-

nisms may be unreported because they are so imbedded in the gestalt of the experience that they are difficult for participants to identify as discrete mechanisms (e.g., self-efficacy, motivation) or because they are such a small part of the overall experience that they go unnoticed (e.g., setting learning goals, which NOLS students typically do). For example, NOLS courses are characterized by an extended expedition in wilderness settings where students have ample time to practice outdoor skills, to interact with peers, and to face significant physical and social challenges. Students learn about and practice leadership, interact with the wilderness around them, and experience the effects of both good and bad decision making. Several important transfer mechanisms, such as active learning, practice, and feedback (e.g., Lee & Kahnweiler, 2000; Meyers & Jones, 1993), are likely inherent in adventure education experiences.

The current data do not provide much evidence to support the idea of "negative transfer" from adventure courses (cf. Wolfe & Samdahl, 2005). More than 80% of the participants reported no lasting negative impacts from course participation; however, negative sentiments were cited by a small number of participants. Some students wished their courses had been different than they had been or reported that something happened during their time in the field that was painful to reflect upon. Other students wished they could live their lives closer to nature or were more able to live in harmony with the values and ethics that they experienced during their course. Certainly, permanent injury and emotionally painful memories were indicators of the potential costs of participation and general fragility of participant experiences. But some of this negative transference, such as a longing to be in the outdoors or a sense of personal conflict regarding environmental issues, is indicative of reflection-based critical thought, which adventure educators aspire for their students.

The results of this study suggest several factors that may be manipulated to further foster transfer in an adventure education setting. For example, developing tactics to influence learner characteristics (e.g., motivation, perceived value), rather than to simply screen for them, and to affect transfer climate (e.g., supervisor and peer support) would be a creative and invaluable process. Studies such as that by Leberman and Martin (2004), which used a post-course reflection activity to foster transfer from an outdoor education program, may represent the future of research attempting to increase transfer. Researchers may also seek to identify individual mechanisms or sets of mechanisms that influence transfer that can be reasonably manipulated during expedition-length courses. Researchers should also take care to account for programmatic idiosyncrasies that influence how these mechanisms are delivered and how transfer is measured.

Based upon this discussion, it is valuable to deconstruct the complex relationship between our data and the contemporary transfer literature.

For better or worse, the inductive nature of our data, gleaned from the experiences of NOLS students, does not conveniently lend itself to integrating findings with a literature concerned primarily with improving job performance. Regardless of methodology, it is likely that transfer in adventure education is markedly different than transfer in human resource development. Learner characteristic mechanisms such as motivation and perceived utility probably operate in different fashions during an outdoor expedition than they do for traditional education or training programs. Intervention design variables may operate quite differently as well, if for no other reason than the visceral nature of small group living out-of-doors relative to a comparatively sterile office setting. Climate and context factors most certainly apply in different ways, as many adventure education programs challenge participants to apply skills to multiple parts of their lives, not just to a work environment.

Limitations

This study has several limitations. The nature of the qualitative data and a sample comprised of NOLS alumni does not allow generalization in a traditional sense, and so it is incumbent upon readers to make appropriate conceptual and practical links to their own programs and applications. In addition, the framework (Burke & Hutchins, 2007) chosen as the primary lens for this study, although well established in the transfer literature, is not entirely compatible with certain conceptualizations and definitions of learning transfer, perhaps, especially, within an adventure education context. The authors' selection of and familiarity with this framework, as well as the individual views of the data coders, adds a degree of bias to the coding and data interpretation. Finally, a choice to focus on the more malleable transfer mechanisms in adventure education (i.e., those involving design and delivery) by asking students about mechanisms on their courses may have limited responses that might have otherwise indicated individual learner or application environment-based mechanisms.

Conclusion

Although the diversity of potential mechanisms and their interactions with the transferable outcomes makes untangling these relationships challenging, several themes emerged from this study. First, transferable lessons can be learned via multiple mechanisms, including instructors (through a variety of behaviors); inherent qualities of the course (the group dynamics, the natural setting); and curriculum (e.g., the leadership progression or other instructor-delivered elements). Second, a number of transferable lessons are tied to occurrences directly attributable to neither the curricular design nor the specific instructor actions. Although some of these are highly predictable, given the nature of a small-group expe-

ditionary program (e.g., some program highlight or challenging event), others are probably more serendipitous and idiosyncratic (e.g., efforts of individual other students or an inspirational event). Third, despite the variety of potential mechanisms at work, instructors play a highly critical role in students' transferable learning outcomes. They are instrumental in curriculum delivery or as role models, mentors, and inspirational and supportive humans. Finally, adventure education programs are fertile environments for fostering transferable learning. The literature on learning transfer involving program design and delivery identifies numerous pedagogical strategies widely used and accepted in adventure education. In fact, it would be difficult to envision an adventure education program that did not center on mechanisms such as active learning, practice, feedback, modeling, and opportunities to perform.

Part of this challenge in providing universal suggestions for adventure education design and delivery involves attempting to effectively manage the confounding effects of learner characteristics and application environments. Despite these challenges, it seems worthwhile to examine mechanisms that may influence transfer of adventure education lessons to post-program contexts. Although some of the lessons will remain beyond the influence of adventure education programs, others can be intentionally addressed through program design and implementation.

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