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What lies beyond effectiveness and efficiency? Adventure learning design

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ABSTRACT

Educational technology and instructional design research has focused on evaluating interventions and innovations in terms of their effectiveness, efficiency, and appeal. While such indicators of learning outcomes are important, designers should also strive for engaging, socially just, and transformational instruction. To illuminate the capabilities of adventure learning, we evaluate three such projects in terms of effectiveness, efficiency, engagement, social justice, and transformational capability. Findings indicate the diverse impact adventure learning has had on K-16 learners and teachers.

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Educational technology and instructional design research have traditionally focused on the design and research of learning environments that are effective, efficient, and appealing (Wilson, Parrish, & Veletsianos, 2008; Merrill, 2008). Our focus on effectiveness and efficiency however, has led to the development of electronic learning environments that often result in disappointed students and instructors, limited motivation, wasted efforts, and ultimately an absence of interesting, meaningful, and engaging learning (Kirschner, Strijbos, Kreijns, & Beers, 2004). While effectiveness, efficiency, and appeal are important indicators of instructional outcomes, a holistic view of educational processes must encompass numerous other learning and instructional goals. For instance, Hmelo-Silver, Duncan, and Chinn (2007) note that educational objectives should go beyond strict notions of learning, encompassing outcomes valued by society, such as students' ability to collaborate. More importantly, for the purposes of this paper, Wilson, Parrish, and Veletsianos (2008) argue that instructional outcomes should be assessed using a broader lens and judged according to (a) effectiveness, (b) efficiency, (c) engagement, (d) "goodness," and (e) transformational impact.

Effectiveness refers to the ability of a program to achieve its proposed goals – for example, language learning software that succeeds in enabling learners to hold a basic conversation in a foreign language is considered to be effective; efficiency means doing so with the least resources possible – regarding the aforementioned software, if it enables learners to achieve basic conversational skills in 6 hours instead of the 10 hours that would have been required had the learner

enrolled in a course, then the software can be considered to be efficient; engagement refers to students investing themselves in the experience of learning, immersing themselves in the learning experience, enjoying the process, and being involved in learning; "goodness" highlights the social sensitivity of instruction – this indicator refers to broader social justice issues such as enabling children of all backgrounds a moral and just treatment; and, last, transformation notes the powerful impact that instruction can have on learners – transformational instruction changes learners and the way they act, think, and feel.

Our intention in this paper is to investigate the outcomes of a series of adventure learning projects, examining how such projects relate to the instructional outcomes proposed by Wilson, Parrish, and Veletsianos (2008). We hope that by doing so, we can encourage others to look beyond effectiveness and efficiency, and strive towards learning experiences that are engaging and transformational while also taking into account the social justice context in which learning occurs. We proceed by defining adventure learning and presenting prior research. Next, we describe our method for investigating adventure learning outcomes and discuss our findings. We conclude by noting the implications of our findings.

1. Literature review

Adventure Learning (AL) is a hybrid distance education approach that provides students with opportunities to explore real-world issues through authentic learning experiences within collaborative learning environments (Doering, 2006, 2007). Grounded on experiential (Kolb, 1984) and inquiry-based (Bransford, Brown, & Cocking, 1999) learning, AL is an innovative approach for the design and delivery of online and hybrid learning. In AL programs, students are active participants in identifying and posing questions, solving real-world problems, and

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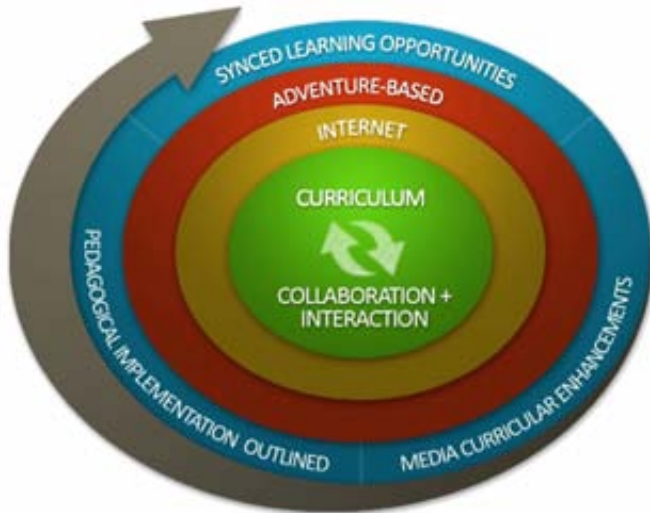


Fig. 1. Adventure learning model.

taking action within their own community. Noteworthy features of the AL approach (Fig. 1) include its focus on adventure, synced learning opportunities, media and curricular enhancements, an outlined pedagogical implementation, the internet, collaboration and interaction, and a modular curriculum (Doering, 2006, 2007). While a number of online distance education projects center on adventure (e.g., BlueZones, the Jason Project, and Journey North), in this paper we will focus on the GoNorth! program because, to the best of our knowledge, it is the only one founded upon the AL theory and guided by empirical support.

GoNorth! is an adventure learning program focused on the circumpolar Arctic traveling throughout Canada, Russia, Alaska, Scandinavia, and Greenland (Fig. 2). The GoNorth! expedition team of educators and explorers travels *live* to circumpolar Arctic regions via dog sleds to provide opportunities for learners to explore real

world issues. The project is grounded on a 300+ page curriculum that is rewritten every year to focus on the current region of travel. The curriculum, travel experiences, and observations of the team are delivered in tandem to an online learning environment that classrooms use to hold real-time conversations with international experts, peoples of the native culture, and the team itself. In addition, teachers and students can interact with the team and with other classrooms via blogs, video feeds, photographs, and 360° QuickTime virtual reality movies. The program is interdisciplinary and free to use with over three million students from around the world participating annually. The latest GoNorth! project (which at the time of writing encompassed a traversal of the Fennoscandian region of Finland, Sweden, and Norway) can be found at <http://www.polarhusky.com>.

Research on AL programs is at its infancy (Miller, Veletsianos, & Doering, *in press*). Prior work has investigated the pedagogical, social, and technological affordances of adventure learning (Doering, Miller, & Veletsianos, *in press*), the use of authentic geospatial data from an AL project within the K-12 classroom (Doering & Veletsianos, 2007), student experiences when teachers implement AL using diverse pedagogical approaches (Doering & Veletsianos, 2008), the experience of educators delivering distance education from remote areas of the world (Miller et al., *in press*), and the construct of motivation in AL projects (Riedel, Doering, Scharber, & Ernst, 2007). Even though the aforementioned manuscripts have investigated various instructional outcomes associated with the GoNorth! adventure learning series, no single paper has yet examined such outcomes in the context of a framework as the one provided, for example, by Reigeluth (1983) or Kirkpatrick (1975). Nevertheless, prior GoNorth! research has so far revealed two important instructional outcomes: student engagement and socially just instruction.

The first persistent finding in the GoNorth! AL literature relates to student engagement. Specifically, prior research has noted that students working with adventure learning projects are excited, motivated, and eager to engage with authentic tasks, solve real-world problems, collaborate with colleagues and experts, and initiate action in their own community (Doering, 2006, 2007; Doering & Veletsianos, 2008). For example, students in GoNorth! classrooms



Fig. 2. GoNorth! locations, cultures, and environmental issues.

built dog sleds and created and sold bracelets to raise awareness about climate change (Doering & Veletsianos, 2008). It is important to note however, that student motivation may vary within adventure learning projects depending on a number of factors. In a previous study for example, researchers have reported a close link between student motivation and teaching philosophy: teachers with a more constructivist teaching philosophy noted higher student motivation than teachers ascribing to more traditional teaching philosophies (Riedel, Doering, Scharber, & Ernst, 2007).

The second finding relates to what Wilson, Parrish, and Veletsianos (2008) have called “good” or socially just instruction. The GoNorth! project is international in scope, giving a portal for the Native voice and power to people and children of this world who are usually “invisible” (e.g. the Chukchi and Yu’pik Eskimo of Russia, the Gwich’in and Inupiat people of Alaska, the Sámi people of Fennoscandia, the Inuit people of Greenland, and the Inuvialuit people of Nunavut). These students have had numerous opportunities to present their culture to children and adults around the world (e.g., London, Moscow, Sydney, Paris, and Philadelphia) bringing opportunities for intercultural understanding and collaboration, and eliminating cultural misconceptions. For example, the following quotes from students participating in Doering and Veletsianos’ research (2007) highlight the social value of the adventure learning approach, “I just couldn’t believe that there were people living in Alaska. I thought it was just all ice, a big ice chunk. I realized that it is well developed, there are cliffs and fields... I thought people lived in igloos. I didn’t know that there were big buildings in Alaska. I learned that there are people living there like in every other state.”

2. Research questions

Informed with the understanding that learning and teaching (with or without technology) should extend beyond effectiveness and efficiency, we were interested in delineating the varied outcomes of

AL projects. Therefore, in this study, we ask: How do Adventure Learning projects relate to the indicators of effective, efficient, engaging, socially just, and transformational instruction?

3. Methodology

3.1. Participants

This study is informed by 24 teachers and 86 students. The teachers come from 22 public schools, one private elementary school, and one community college. The students are from five classrooms throughout the United States. The teachers used the GoNorth! Arctic National Wildlife Refuge (ANWR) 2006, GoNorth! Chukotka 2007 and GoNorth! Fennoscandia 2008 AL program in their classrooms during the 2006–2008 academic year. The students used either one or all of the projects.

3.2. Data sources

The data corpus informing this study consists of four main data sets: teacher surveys, student surveys, student focus groups, and teacher personal interviews. The teacher and student surveys were administered online at the end of each program; the personal interviews and focus groups were performed face-to-face at the end of each program. Interview and focus group data was transcribed ad verbatim. All data sets were entered in NVIVO 7 for qualitative analysis.

3.3. Data analysis

We used the constant comparative method (Glaser and Strauss, 1967) to analyze the available data inquiring into the five specific descriptors put forth by Wilson, Parrish, and Veletsianos (2008) – effectiveness, efficiency, engagement, “goodness,” and transformational

The screenshot shows a web interface for a trail report. At the top, there are navigation tabs for 'Explore', 'Logistics', and 'Support'. Below these are sub-tabs for 'Trail Reports', 'Scrapbook', 'Timber Tales', 'Zones', 'Map It!', 'Read It!', 'Send-A-Note', 'Q & A', 'Chat', 'Quiz', and 'Challenge'. A week selector at the top shows 'Wk 01' through 'Wk 12' (highlighted) and 'Week 13'. The main content area features a large image of a sunset over a body of water with a dark silhouette of a person or animal in the foreground. Below the image is the title 'Wk 12 ● Chukotka Riches: Bears and Cucumbers!' and a metadata box containing: 'Date Posted: 5.7.2007', 'Location: 64°54N 172°29W', 'Yanrakynnot, Chukotka, Russia', and 'Weather Conditions: Sunny with clouds, 32°F (0 °C)'. The main text begins with '“I’m exhausted.” says Jeff with a smile when asked to sum up the day. Eleven hours of running with the Polar Huskies. Waking up at 4 AM and out of the tent at 6 AM and on the go about 45 minutes later. Our campsite was located on the Bering Sea with long sloping valleys surrounding us. Our vista was a floe edge where open water meets sea ice. The ice had numerous black dots where seals basked in the sun soaking up the heat. Scorching temperatures in the forties (3'. A small photo of a person in a red jacket is visible at the bottom right of the text area.

Fig. 3. Trail report: a report from the trail delivered to the online environment every Monday.

Fig. 4. Beacon Blog: a blog updated twice a week about what was happening on the trail from the perspective of the dog Beacon.

impact. Data were first analyzed independently by each author, noting emerging patterns. The authors then met three times to discuss their individual findings. At each meeting, the data were reanalyzed and triangulated across data sources in order to confirm and disconfirm evidence for the patterns. This process continued until consensus was reached between the authors.

4. Findings

Any lesson or instructional intervention can have multiple consequences. This is especially true of the GoNorth! project due to its (a) scope, (b) relationship with real-world issues, and (c) international involvement. To elucidate the intended (and unintended) consequences of the GoNorth! projects, we have related our findings to each of the five indicators described by Wilson, Parrish, and Veletsianos (2008). Even though we are presenting our findings in discrete categories, note that the outcomes may be interrelated or may be in contrast to each other. For example, engaging classroom activities may not always be the most efficient way to deliver instruction.

4.1. Effectiveness

Effective instruction occurs when instruction meets established learning goals and objectives. The goals of the GoNorth! AL program are to: 1) provide innovative educational opportunities that excite and inspire youth, 2) foster worldwide collaboration on environmental and cultural issues among students and the general public, 3) encourage respect, interest, and knowledge of and across cultural boundaries, 4) generate environmental understanding, awareness, and stewardship and 5) support appreciation of human diversity and traditional values. These goals may be achieved through the use of the curriculum and the online learning environment. Remarkably, 95% of teachers and 80% of students surveyed and interviewed made

comments about the goals of AL and the effectiveness it has had on their classrooms.

4.1.1. Appreciation of culture and the environment through collaboration

Sixty-three percent of the teachers commented that the online learning environment afforded collaboration across the world while also encouraging respect, interest and knowledge of cultures and the environment. Teachers felt that the GoNorth! program engaged students to use and, more importantly, benefit from technology in the classroom. Beth¹, a 7th grade teacher, said, "It's amazing to me that you can have so many people collaborating online about the same topic being studied. We could see students who had posted in the collaboration zones from all around the world. We also saw it in the expert chats. It is simply amazing and it motivated my students to learn both about the location of study but also about others who were using the program." Rick, a 3rd grade teacher said, "We want students to care about what they are studying. We want them to get involved and care about the content. My students are part of this project during the entire expedition. They care about the environment and everything [Team GoNorth!] is doing." Sue, a 6th grade teacher said, "My students love to collaborate and get involved with the GoNorth. They also want to do stuff locally that will hopefully 'make a difference.' They truly believe that each person has a voice. From the trail reports (Fig. 3) to Beacon Blog (Fig. 4), they were online whenever they could be. Even at home."

Students also felt that collaboration was a beneficial feature of the learning environment. Eighty-five percent of the students made comments about collaborating online. Ranging from the collaboration zones (Fig. 5) to the expert chats, they noted that they enjoyed reading what others wrote and sharing their story. Joey, a 5th grade student commented, "It was really neat to be able to see where everyone was collaborating. We could look at the projects, but we could also see it

¹ All names are pseudonyms.

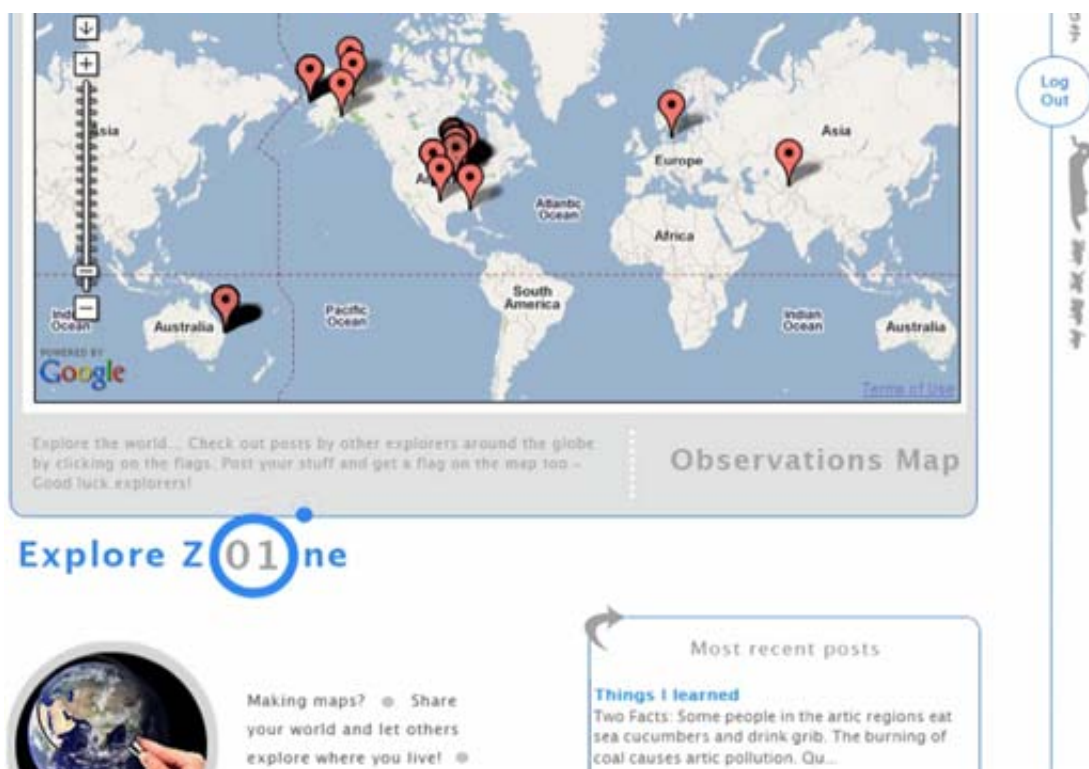


Fig. 5. Collaboration zone: a location to share ideas and data.

[in the collaboration zones]". Nancy said, "I just think we should do more of things like this [collaborating]. It allows us to see and do so much more than we usually do in class. We get to not only learn about it from Mr. Miller [the teacher], we also get to hear and see it online."

4.1.2. Innovative technology

The "innovative" uses of technology were commented on by 55% of the teachers and 78% of the students. Nancy, a 4th grade teacher said, "This is how the use of technology should be. It's where you use the technology and it seems like it is just meant to be. No one is forcing anything." Dan, a 7th grade teacher said, "I love technology and I thought I knew a lot about using it in the classroom. That was until I started using polarhusky [the website for the GoNorth! project]. The way it all fits together is beautiful. Students can spend hours online while learning what I just taught them." George, a 6th grade teacher said, "This is just cool stuff. Getting updates from the Arctic sometimes immediately and other times just a few hours later is great! It is a story that just keeps on giving."

Eighty-five percent of the students made comments related to the technology. Wolfgang, a 5th grade student said, "I love how you can see and watch all the dogs. I can see Timber (a dog) and also watch him. That is the same with the 360 degree [Quicktime virtual realities], you can walk in the same place that the team does." Jessica said, "I just like that I can listen to the audio updates every day. It is so cool that I can hear what they are doing every single day."

4.1.3. Environmental stewardship and appreciation

A major goal of GoNorth! is environmental stewardship and it was mentioned by 45% of the teachers and 55% of the students. A deep appreciation for the environment was mentioned at multiple levels throughout the surveys and interviews. Jack, a 5th grade teacher commented, "My students really wanted to make a difference locally. They really seemed to care about what may be happening to the environment and their future. It was truly a change that I had never seen." Sue, a 6th grade teacher said, "My students worked to get their

parents to drive less and make wiser decisions about things such as family vacations and trips to the store." This appreciation for the environment was also shown by comments from students. Jackie, a 5th grade student said, "I really do want to make a difference and I believe I can. I am learning how through polarhusky."

4.2. Efficiency

Efficient instruction refers to the attainment of the established goals and objectives with minimal resources in terms of time and money. The design of the GoNorth! AL program is guided by the fact that K-16 teachers do not have much time for preparation during the school year. The curriculum and online environment are designed to be all-inclusive (Doering, Hughes, & Scharber, 2007) where all necessary factors needed to effectively teach the program are included in the design of the program. With this goal in mind, the data revealed that teachers valued the efficiency of the program in terms of cost and design and flexibility.

4.2.1. A free program

The GoNorth! AL program is a free program that can be adopted by any teacher who signs up to utilize it within the classroom. Upon registering, teachers receive a username and password for their classroom that allows them to enter the gated areas: the collaboration zones, the curriculum, and the expert chats. Beth said, "You just can't go wrong with this program; it is free when teachers have no money to use for professional development or purchasing of textbooks. I love it." Jill said, "As a new teacher, I liked being able to experiment with the program while not having to commit one thousand dollars to get started. It was great."

4.2.2. Curriculum design and flexibility

The curriculum is designed with three levels of integration based on the level of inquiry: experience, explore, and expand. Teachers can adapt the curriculum based on what works best in their classroom.

Moreover, the curriculum includes a calendar that details how the learning activities would optimally be integrated into the classroom if all features of the environment were utilized. Thus, teachers can “pick and choose” based on their needs. Jeff, a 7th grade teacher said, “I can adopt it to all my students in the classroom. I use a different strategy with the curriculum every hour. I also like that I can look at the calendar and know when the expert chats or the game shows are available.” Nancy, an 8th grade teacher said, “If you can't use GoNorth! in the classroom, you can't teach. It is as flexible or as prescribed as they come.”

4.3. Engaging

Engaging instruction refers to instruction that draws students in a learning experience while allowing them to invest their self to the experience. Engaging instruction capitalizes on learners' desire and willingness to act on their learning, and adventure learning is built on this premise. From the authenticity of the curriculum and the trail reports to the synchronous expert chats, game shows, and collaboration zones, it is meant to engage the learners as they meet the curricular goals. Specifically, the data revealed that the students were “engaged” at numerous levels — project development, family involvement, and personal actions.

4.3.1. Project development

Approximately 70% of the teachers made comments that their students would complete projects that were more “in-depth” and of “higher quality” than normal when using the GoNorth! AL program. Students' comments also revealed their excitement for completing the class assignments. Beth, a 5th grade teacher said, “My students were simply more engaged all the time when using polarhusky. They just loved the dogs and any projects we did. They would create videos and dioramas and love it all.” Jon, a 4th grade teacher said, “Reading was so easy. I never had to fight with the students to read. They would love reading the trail reports and doing the assignments. Really. I am not joking. It was that it was real to them.” Bobby, a 5th grader commented, “Yes, it was just so cool. We made a video about global warming and saving the bears. I wish we could always do projects like this.”

4.3.2. Family Involvement

Forty percent of the teachers noted how the students would discuss GoNorth! with their families and they would hear from parents about the project. Rick, a 5th grade teacher said, “My students would take the project home with them. They would get their parents to sign on with them and they would show them what we were studying.” Beth, a 4th grade teacher said, “The students are getting their parents involved. From the web site to actually making a behavior change, such as driving different, it is happening.” Delania, a 4th grade student said, “I went home and showed my parents my dog [each child “Adopted” a polar husky dog] and we followed it throughout the entire trip!”

4.3.3. Personal actions

Students made many comments regarding personal changes they or their families made because of GoNorth!. It appears that the project drew learners in the experience, encouraging them to invest themselves making commitments for change. Rachael, a 6th grade student said, “My parents and I are walking to the store now whenever we can. We want to save the polar bears and the environment.” Dan, a 5th grade student said, “We have decided to carpool. Well, not me, but my parents. They are now riding to work together once in a while.”

4.4. “Good” or socially just

The development of a socially just curriculum and learning environment is at the heart of an adventure learning program. The

design and content must lend itself well to learners expressing and understanding emotions inherent to an issue and the ways in which such an issue can be presented and debated. For example, each program in the GoNorth! adventure learning series focused on an Arctic locale, its Native people, and an environmental issue relevant to their daily lives. Paired with the significant challenges the Arctic peoples currently experience as they face a rapidly changing climate, the selected environmental issues within the GoNorth! curricula institute a threat to these peoples culture. At the same time, the environmental questions are also part of learner's daily lives on a global scale. For example, GoNorth! ANWR 2006 focused on the region of the Arctic National Wildlife Refuge, the Gwich'in and Inuit people and investigating the environmental question of ‘oil exploration.’ Setting out with the perspective of the Gwich'in Indians in the heart of Alaska the AL experience followed in the path of the porcupine caribou herd 5000 ft across the Brooks Mountain range and out on to the coastal plains of the Arctic Ocean. This is where the maritime Inupiat Eskimo people are being asked to allow oil exploration to take place on the birthing grounds of the very porcupine herd. The journey of learning ended in Prudhoe Bay, a community of oil rigs where workers from near and afar work to supply and meet our oil demands.

Committed to inquiry, questioning and participation, the modules in the GoNorth! curriculum are driven by “Module Questions.” For example, in *Module 3 Flora & Fauna: Animal Population*, the question is “What are the effects on animal populations from oil exploration?” Each module is organized in three sections. While the first section introduces the topic through investigation of what is considered “general knowledge,” the second section uses “Native knowledge” as springboard for learning. These first two sections underpin the investigation of the third section, a case study from the Arctic locale using actual facts and figures to present the often complicated issues to the learner. Throughout the curriculum, learners are encouraged to verbalize opinions and express emotions, thoughts, and personal perspectives. Often, such actions occur while learners interact with topic experts through live chats, with the field ‘explorers’ through weekly correlated “question and answer” sessions, and with fellow learners in the module specific collaboration zone.

GoNorth! ANWR 2006 took place at the height of the national debate in the United States regarding whether or not the Arctic National Wilderness Refuge should be opened up for oil exploration. The stage set for a fiery AL program, a “Polar Husky crazed” group of US senators followed along for the in-depth first hand impressions and voices from the area, and indeed Team GoNorth! encountered great passions of opinion on the trail. With such a setting, the absolute need for objectivity and sensitivity to all perspectives was needed. This accuracy involves the curriculum writers doing extensive research into primary resources so the curriculum and online learning environment are accurate. For the AL experience to be delivered from the field in the most successful manner, perspectives must be presented with vast nuance which in turn demands in-depth prior knowledge. In the case of Team GoNorth!, the team members were welcome in the homes of the Native locals as well as on the oil platform in the Arctic ocean to deliver the best possible program.

As stated earlier, the design and content must lend itself to expressing and understanding emotions inherent to an issue and the ways in which such an issue can be presented and debated. These emotions were discussed by 40% of the teachers. They discussed how “passionate” their students became about an issue and the way they loved to debate the module issues. Beth, a 5th grade teacher said, “I have not seen my students so passionate about learning what it means to be Native in the Arctic. They just wanted to get involved and share their story.” Stacy, a 4th grade teacher said, “My classroom is like a new place since we started using GoNorth! My students care, ask questions, and are doing research about issues they would never care about before.”

When AL is developed to its full potential it can be a powerful tool for socially just teaching. Learners experience a global problem through local windows, both in the remote Arctic location and in their own local setting, learning the skills and knowledge to debate and participate in global solutions.

4.5. Transformational

The notion of “transformational” learning has been extensively investigated (e.g., Boyd & Myers, 1988; Clark, 1993; Rowland & DiVasto, 2001). In the context of this paper, transformational instruction refers to experiences that change learner identities and are deeply meaningful. In addition, according to Wilson, Parrish, and Veletsianos (2008, p. 42), “transformative learning is not under the full control of the designer, but rather requires a combination of careful guidance within crafted learning environments and learners who are ready and willing to become passionately engaged.”

The data informing this study revealed that both teachers and students discussed their passion for learning as they experienced the GoNorth! journey unravel. They both discussed the experience of waiting for the next situation, for the next adventure to develop and come into being. From meeting Native Elders on the trail by an Inukshuk where they were hunting caribou, to dogsleds falling through the ice, each year presents a new story that is supported by an inquiry-based curriculum, numerous media assets, and collaborative experiences.

Sixty percent of the teachers commented that their students were doing positive things in the classroom they had never seen before. These “things” ranged from students who were discussing a topic out loud with the class when they had never done this before, students who would bring up ideas on what project they would like to do next

to study the Arctic, to students who went home and discussed what they learned with their family. Jessie, a 4th grade teacher stated, “Each year my students ask if we are going to do polarhusky. In fact, it’s not just the students. I also get calls from parents asking if I am going to teach it. The students become part of the story, adopt a dog, and follow along as they learn content – and they don’t even know they are learning.” Beth, a 5th grade teacher commented, “I can’t explain it really. The hallways are full of life-sized dogs made out of paper and my students know everyone from the team – from the dogs to the people on the GoNorth! team. They are coming to me with ideas of what they want to do next to help save the environment and what project they want to do to share to the [collaboration] zones (Fig. 6).”

Eighty-five percent of the students discussed that they “would not forget” their experiences with the GoNorth! project. The students reflected on numerous classroom activities sharing that the way they felt, acted, and thought about the Arctic and Native populations changed. Brad, a 5th grader said, “This is what I will remember during this school year. I had no idea about any locations like the Arctic. I didn’t no people lived there and I didn’t know that what I do here actually effects them. It is just crazy that I could watch and read about GoNorth! every week.” Jessie, a 7th grader noted, “I love polarhusky. It is because what we are studying is actually real and you can see it and hear it. It makes me want to get involved and do something like they are doing.” Jessica, a 5th grader said, “I think I have showed all my friends and family polarhusky. I want them to see what I do and how they can also make a difference.”

5. Conclusion

How does one judge good instruction? Effectiveness and efficiency are two indicators that have been widely used to judge instructional



Fig. 6. Student work: four examples of a school where students are using GoNorth!

outcomes. Nevertheless, these two measures are not enough. What is the value of a video game that achieves its goals (e.g., instilling problem-solving ability), but is plagued with gender or racial stereotypes? Conversely, what is the value of an airline safety training simulation that is socially just, but whose trainees don't show any evidence of learning? In this paper, we explored learning outcomes extending beyond effectiveness and efficiency and investigated how adventure learning projects relate to instruction that is engaging, socially just, and transformational. Results indicate the diverse impact adventure learning projects have had on students and teachers, revealing the profound transformation that some students experienced by being part of these projects. When learning captures students' hearts, it extends beyond the walls of the classroom, changing behaviors and attitudes, empowering people to instill change within their own family and community. Importantly, drawing from our experiences with global adventure learning projects, we can put forth a number of recommendations for the design of electronic learning environments.

First, it is imperative to note that transformational learning via online, hybrid, or distance learning is possible. The use of technology should not only be limited to the efficient delivery of information. Adventure learning projects have shown how information can be transformed to be interesting, engaging, and valuable with the use of technology. Once designers recognize that we can (and should) provide the opportunities for learners to engage in transformational learning experiences, then we can aim for higher learning outcomes.

Second, because such outcomes have been observed in adventure learning projects, designers could use adventure learning theory to create online learning environments that extend beyond effectiveness and efficiency. Importantly, adventure learning projects can extend to diverse topic areas. For example, the daily activities of teachers can be viewed in an adventure learning context. Or, peace-building efforts can be built around the notion of adventure learning. By exploring the theory of adventure learning, designers can create learning environments that capitalize on the affordances of the theory to engage and transform learners within a socially appropriate context.

Our hope in this paper is to encourage designers and researchers to look beyond effectiveness and efficiency in search of learning experiences that transform individuals. By investigating how the five indicators presented by Wilson, Parrish, and Veletsianos (2008), may surface in a real-world learning environment, we also hope to assist others in identifying how learning that goes beyond effectiveness and efficiency can be identified.

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References

- Boyd, R., & Myers, G. (1988). Transformative education. *International Journal of Lifelong Education*, 7(4), 261–284.
- Bransford, J., Brown, A., & Cocking, R. (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- Clark, C. (1993). Transformational learning. *New Directions for Adult and Continuing Education*, 57, 47–56.
- Doering, A. (2006). Adventure learning: Transformative hybrid online education. *Distance Education*, 27(2), 197–215.
- Doering, A. (2007). Adventure learning: Situating learning in an authentic context. *Innovate—Journal of Online Education*, 3(6). Retrieved on July 17, 2008 from <http://www.innovateonline.info/index.php?view=article&id=342>
- Doering, A., Hughes, J., & Scharber, C. (2007). Teaching and learning social studies online. In C. Cavanaugh & R. Blomeyer (Eds.), *What works in K-12 online learning* (pp. 91–103). Washington DC: ISTE: International Society for Technology in Education.
- Doering, A., Miller, C., & Veletsianos, G. (in press). Adventure Learning: Educational, social, and technological affordances for collaborative hybrid distance education. *Quarterly Review of Distance Education*.
- Doering, A., & Veletsianos, G. (2007). An investigation of the use of real-time, authentic geospatial data in the K-12 classroom. *Journal of Geography, Special Issue on Using Geospatial Data in Geographic Education*, 106(6), 217–225.
- Doering, A., & Veletsianos, G. (2008). Hybrid Online Education: Identifying Integration Models using Adventure Learning. *Journal of Research on Technology in Education*, 41(1), 101–119.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago: Aldine Publishing.
- Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist*, 42, 99–107.
- Evaluating training programs. Kirkpatrick, D. L. (Ed.). (1975). *Alexandria VA: American Society for Training and Development*.
- Kirschner, P., Strijbos, J., Kreijns, K., & Beers, P. J. (2004). Designing electronic collaborative learning environments. *Educational Technology Research and Development*, 52(3), 47–66.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
- Merrill, M. D. (2008). Converting e3-learning to e3-learning: An alternative instructional design method. In S. Carliner & P. Shank (Eds.), *The e-Learning Handbook: A comprehensive guide to Online Learning* (p. 359–400). San Francisco: Pfeiffer/Jossey-Bass.
- Miller, C., Veletsianos, G., & Doering, A. (in press). Curriculum at forty below: A phenomenological inquiry of an educator explorer's experiences with adventure learning in the Arctic. *Distance Education*.
- Reigeluth, C. M. (1983). Instructional design: What is it and why is it? In C. M. Reigeluth (Ed.), *Instructional-design theories and models* (pp. 3–36). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Riedel, E., Doering, A., Scharber, C., & Ernst, D. (2007). "Timber for president": Adventure learning and motivation. *Paper presented at the 2007 American Educational Research Association meetings, Chicago, IL*.
- Rowland, G., & DiVasto, T. (2001). Instructional design and powerful learning. *Performance Improvement Quarterly*, 14(2), 7–36.
- Wilson, B., Parrish, P., & Veletsianos, G. (2008). Raising the bar for instructional outcomes: Towards transformative learning experiences. *Educational Technology*, 48(3), 39–44.

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