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**Technology Enhanced Teaching:  
From Tinkering to Tottering to Totally Extreme Learning**

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**Introduction and Project Overview**

Informal learning resources and tools are exploding online. Education is increasingly becoming free and open. However, most people look to traditional schools, universities, and training environments as the vehicles for learning. In response, the Extreme Learning research project is documenting how people learn or teach online or with technology in nontraditional or unusual ways. We are interested in how education takes place in casual informal situations as well as how formal learning stretches beyond schools and universities to more extreme learning environments such as that taking place on trains, planes, mountain tops, boats, and war zones. Extreme learning is a new concept that stretches ideas or perspectives about when, how, where, and with whom learning takes place. As such, it is vital to begin to document and understand its potential.

Some instructors tinker with their classes and add supplemental resources or blended learning opportunities. Some learners, too, access simple resources like Wikipedia pages or online videos to help them learn. Others totter with or revamp their classes by adding in guest experts from around the planet or adding cross-class collaborations with wikis (Bonk, Lee, Kim,

& Lin, 2009, 2010), videoconferencing (Lee, 2006, 2010; Lee & Hutton, 2007), and collaborative documents like Google Docs. Such instructors are in the midst of transforming or nearly transforming their courses with by using emerging technologies to experiment with and later establish entirely new ways to teach. At the same time, learners might use technologies for online study groups, online work teams, or Web-based data collection to significantly alter how, when, and where they learn. They too are “totterers.” Still others learn or teach with vastly new or transformative ways which we call extreme. They push the edges of teaching and learning by tracking scientific discoveries as they occur in the Indian Ocean, blog posting during their polar expeditions, or learning a new language from someone in a faraway land.

While we are interested in the tinkering as well as the tottering opportunities brought about by new technologies for learning, it is the more extreme aspects of learning that our team is focusing on. In the Extreme Learning Project, we are cataloguing and evaluating hundreds of extreme learning resources, tools, and projects found online. These include resources related to online language learning, social change and global education, adventure learning and environmental education, online portals for learning different subject areas, shared online video resources like the Khan Academy, and different forms of virtual education from that for primary and secondary education to adult online learning. In addition to this content analysis, we are also surveying and interviewing children as well as adults with a set of questions about their learning or teaching experience with technology. In collecting this data, we are attempting to document moments in their informal and extreme learning situations with Web-based technology wherein they experienced an “empowerment moment” or key event that changed their lives in one or more significant ways (e.g., a career change). At the same time, we are surveying and

interviewing those teaching in such environments to better understand how such tools can be used.

There are myriad goals for this research. First, by cataloguing hundreds of ways in which informal and nontraditional Web-based learning has impacted people across ages, gender, ethnicities, and cultures, we hope to inspire others to continue to learn across their lifespan. As part of this project, we will create an online tool and associated repository for individuals around the planet to tell their stories of life change with Web-based technologies. In addition to evaluating the quality of informal learning Web resources, projects, and tools, surveys, interviews, and focus group sessions will further inform their casual informal as well as more extreme forms of learning and teaching pursuits.

### **Background Information**

Inspired by Thomas Friedman's (2005) book, *The World is Flat*, and with the help of many colleagues, Bonk (2009b) detailed 10 technologies that were changing education across educational sectors and age levels, opening up education to countless millions of people who previously lacked such opportunities. At the same time, these changes were enhancing and supplementing the learning possibilities of those who already had significant educational access.

As shown below, a simple mnemonic, "WE-ALL-LEARN," captures those ten trends.

### **Ten Openers: (WE-ALL-LEARN)**

1. **W**eb Searching in the World of e-Books
2. **E**-Learning and Blended Learning
3. **A**vailability of Open Source and Free Software
4. **L**everaged Resources and OpenCourseWare
5. **L**earning Object Repositories and Portals
6. **L**earner Participation in Open Information Communities
7. **E**lectronic Collaboration
8. **A**lternate Reality Learning

9. Real-Time Mobility and Portability  
10. Networks of Personalized Learning

It became increasingly obvious that the open learning world was pervasive and growing. Bonk's resulting book, "*The World Is Open: How Web Technology Is Revolutionizing Education*," (2009b) offered a glimpse of the free and open online learning world. What became evident when collecting data for this book is that while a wealth of learning technologies were emerging for learning, it was the stories of life change that was the most captivating and important to document.

Discussing various technologies for learning documented in his book, Bonk decided to capture stories of people who were designing and developing each technology discussed as well as life narratives and anecdotes of those impacted by the innovations. Each story was a personal account of how one takes advantage of learning technologies to gain new skills and competencies, and ultimately, change one's life.

Take, for example, Wendy Ermold, a researcher and field technician for the University of Washington Polar Science Center (Bonk, 2009a). Wendy conducts research in Greenland and in other northern locations on this planet. Learning is possible even when in such remote places far away from traditional schools and universities. Wendy informed us that when out on the icebreakers or remote islands, she listens to lectures and reviews various open educational resources she has found. Such content often comes from MIT OpenCourseWare (OCW) as well as from Stanford, Seattle Pacific University, and Missouri State University. Each is used to update her knowledge of physics and other content areas. As such free and open educational resources expand, learning becomes increasingly personalized and catered to a particular learning need or learner preference.

Then there is the amazing story of Bridey Fennell. Bridney completed four Indiana University High School (IUHS) courses while enjoying a five month sailboat journey with her parents and two sisters from Arcaju, Brazil to Charleston, South Carolina (Bonk, 2009b). Ship dock captains and retired teachers could proctor her exams when in port and she could practice her French lessons on different islands of the Caribbean. At the same time, her sister Caitlin posted updates about their daily activities to her blog while elementary students in the Chicago area monitored their journey and corresponded with her. Two years later, Michael Perham and Zac Sunderland, both 17 years-old, blogged and shared online video of their record setting solo sailing journeys around the globe (Bonk, 2009a). Amazingly, they each completed their adventures in the summer of 2009 at the tender age of 17. Anyone online could track their daily experiences and post comments in their blogs to respond to.

While such stories are certainly in the minority, hundreds of millions of people are now learning using some online tool, resource, or activity. The Web offers new hope for a degree, education, hobby, or personal lifelong learning option. There are few if any research projects documenting the opportunities of open educational resources and new learning technologies. We intend to capture stories of people who are learning or teaching languages online, learning or teaching in virtual worlds, learning or teaching about environmental education, etc. So much is possible. Learning no longer is primarily the domain of schools, colleges, universities, and corporate training environments. Perhaps 80 or 90 percent of learning is nontraditional or informal (Cross, 2007). Yet, there is little documentation of such learning. As we seek the far edges of such learning, we label it extreme learning.

### **Informal and Extreme Learning**

For the purposes of this project, we define **Informal learning** as a self-directed activity that takes place at any time one wishes and could be part of one's school work, family life, leisure pursuits, or work activities. In this project, we are mainly concerned with informal learning on the Web or with learning technology. It often will involve brief sojourns online to find an important piece of information such as how to diagnose and deal with a health-related problem, the train schedules for a foreign city or country one plans to visit, or a comparison chart of the features of different smartphones or tablet computers.

At the far edges of informal learning is what we refer to as "**Extreme Learning.**" While extreme learning can relate to both physical and cyber learning, for the purposes of this project, we will refer to extreme learning as activities that involve learning ways with technology in unusual or unique ways, including that which occurs on boats, planes, trains, or buses, as well as when hiking, running, and walking (Bonk, 2009a). With appropriate Web access, one's teachers, guides, and mentors can now come from arctic regions as well as those involved in social change causes while running across the Sahara Desert. While some refer to this as informal or nontraditional learning, we call this type of learning as "extreme learning."

The Extreme Learning research team is exploring how people learn or teach with technology in unusual ways; such as from planes, trains, boats, mountain tops, islands, icebergs, space stations, parks, monuments, and war zones. We also are interested in museum-based learning as well as those learning in religious missions, retreats, vacation resorts, submarines, camps, research stations (e.g., Antarctica), outdoor classrooms, grocery stores, zoos, conferences and institutes/summits, cafes, bookstores, nursing homes, hospital beds, and shopping malls. Not done? In addition to that, extreme learning can include learning from involvement in virtual worlds, online communities or groups, webinars, webcam experiences, text messaging, mobile

devices, virtual schools, open educational resources and OpenCourseWare (OCW), open universities, and free universities or courses.

As shown in Figure 1, students can learn even when there are no school or teachers in their community. For instance, mobile devices can now place a teacher or an entire school curriculum in one's pocket (Kim, 2009; Kim, Buckner, Makany, & Kim, 2011). Instead of simply receiving information, learners can also tell their own stories with such devices. And such stories can be shared around the world as well as across local tribal boundaries of groups previously at war or currently in conflict (Buckner & Kim, 2011). The Extreme Learning research team is exploring these areas and much, much more. This is the age of open education. It is time to take advantage of it.



Figure 1. The Pocket School project (courtesy of Dr. Paul Kim, Stanford University and Seeds for Empowerment).

In effect, extreme learning explores how people learn or teach with technology in unusual or unique ways outside of traditional educational settings. Extreme learning can involve learning while on a boat at sea near the North Pole or when sailing around the world. It also occurs when tracking the blog and podcasts postings of those in similar adventures such as riding a bike or a car around the world or through the Americas. Highly extreme forms of learning occur when watching educational videos on inflatable screens that can rotate from island to island (see Figure 2).

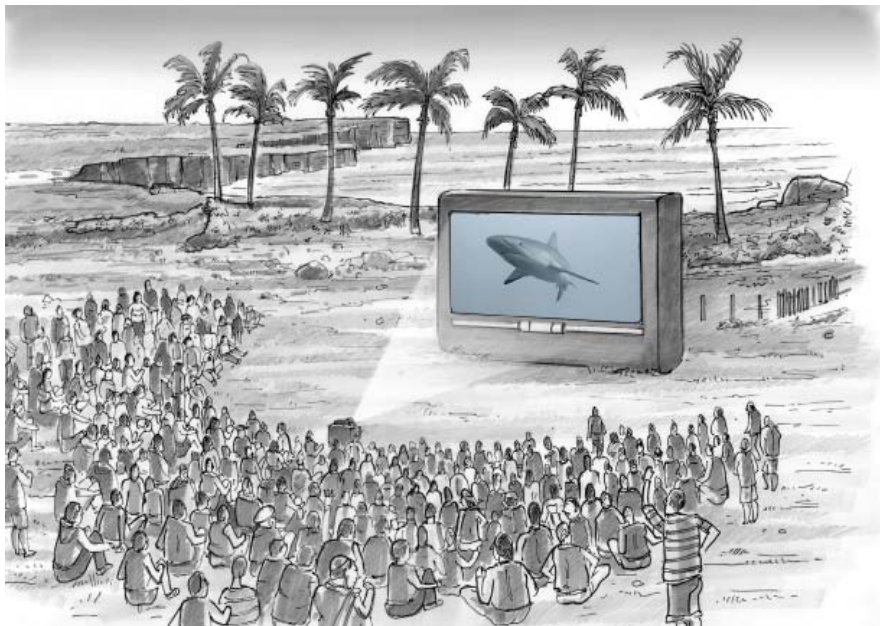


Figure 2. Example of Extreme Learning: Shark Television (a 24 foot inflatable screen and outdoor ocean theater intended for tiny island communities; courtesy of Cassandra Brooks).

We are also interested in document more sedate and passive forms of informal learning including watching an online video in TED, LinkTV, CurrentTV, or YouTube (Bonk, 2011). Through open educational Web resources, those stuck behind prison walls, injured and in a hospital bed, or unemployed and unable to pay for college tuition can learn to be more productive members of society. Others might be in transition from one career to another and find



open educational resources and OCW can arouse new interests and confidence (Iiyoshi & Kumar, 2008). Still others might be retired and offer their educational ideas and mentoring services to anyone interested in the topic. Others might be earning their MBA while in war zones in Iraq or Afghanistan.

### **The Need for Extreme Learning Research and Development**

Without a doubt, the forms of learning delivery and opportunities to learn have exploded during the past decade. Many still search for new discoveries and learning truths in the traditional walled classrooms or subject matter areas. However, learning is increasingly informal and self-directed or self-selected. Cross (2007) contends that more than 80 percent of learning is currently informal. There is good reason to believe that such numbers will increase in the coming decades. Thousands of Web tools, resources, and activities allow one to learn from on demand and just when needed. The resources for online language learning, basic skill rehearsal, global education, social change, adventure, and environmental education have accelerated the past few years. Educators are increasingly calling for global education activities and curricula in order to properly prepare children for the twenty-first century (Longview Foundation, 2008; Merryfield, 2007, 2008; Merryfield & Kasai, 2009; Riel, 1993). Why then are the vast majority of learning studies conducted in classroom settings?

There is a dire need for research that explores many of these informal and nontraditional learning pursuits. First, the scope of such Web resources, tools, and activities needs to be better understood. Just what is available? There is no resource or project today that serves as a gateway for casual informal learning to that which might be considered more unusual or extreme.

Second, from such resources, there is a need to grasp the quality of them. One mechanism for assessing and documenting quality indicators is to evaluate these resources using some set of

criteria. Making such rating available will help learners, instructors, and government agencies better understand what is possible.

Third, understanding the types of learning activities that commonly occur within different types of informal or more extreme learning is needed. As forms of learning are compiled, people can more thoughtfully reflect on the potential skills and competencies that different resources make possible.

Fourth, as part of understanding the learning outcomes or potential, there is a need to capture case studies of individuals whose lives have been altered or significantly changed from casual informal as well as more extreme learning or teaching pursuits. Such stories might include those obtaining their MBAs while in war zones, teenagers traversing the globe solo while being home schooled, penguin researchers sharing their findings via satellite, and people in hospitals exploring open educational resources and finding a new career option.

During the past two years, our research has begun to investigate the above questions. We have generated an expanded list of informal as well as more extreme learning resources and technologies. More than two hundred of these resources have been evaluated for eight distinct criteria.

Despite all the hope and possibilities for open education and open learning (Iiyoshi & Kumar, 2008), minimal is known about new learning formats and delivery mechanisms for open education. Questions arise about the tools and systems that might prove attractive to informal or nontraditional learners. In particular, areas such as outdoor, environmental, and adventure learning bring unique learning opportunities that were seldom possible before (Doering & Veletsianos, 2008). As adventure learning is increasingly made available and embraced, there is a need to know more about the quality, use, scalability, and maintainability of these new

resources (Veletsianos & Klanthous, 2009). Issues arise related to accessing these contents and understanding how learners might use them to augment, enhance, or accelerate their learning. Just how are lives impacted? Are there empowerment moments that can be captured, demonstrated, explained, and perhaps replicated or extended? If informal and nontraditional learning routes found in outdoor and adventure learning foster new forms of learning as well as increase internal desire and motivation to learn, there is a pressing need to know the reasons why.

At the same time, scant information exists about those using technology tools and resources to teach in unusual or nontraditional ways. Thousands of online educators are offering their services for free online to help others around the world learn languages, vocabulary, geography, mathematics, and many science-related disciplines. In addition, such instructors can now find residence in a boat, car, dogsled, or café (Bonk, 2009a). Aaron Doering and his colleagues at the University of Minnesota call this Adventure Learning (AL) (Doering, 2006; Doering & Veletsianos, 2008). It is here at exciting and content rich curriculum materials can be developed in progress whether it is 40 below zero or 120 degrees Fahrenheit (Miller, Veletsianos, & Doering, 2008; Veletsianos & Klanthous, 2009).

We are exploring the motivations of those involved in such quests. Are there particular instructional formats that are most conducive to learning from such adventures; especially when outside traditional educational institutions or long-held standards related to effective instruction? How are such online experts and their materials accessed? How is curriculum created around learning adventures? And why do so many individuals create content or offer their instructional services online for free or nominal costs?

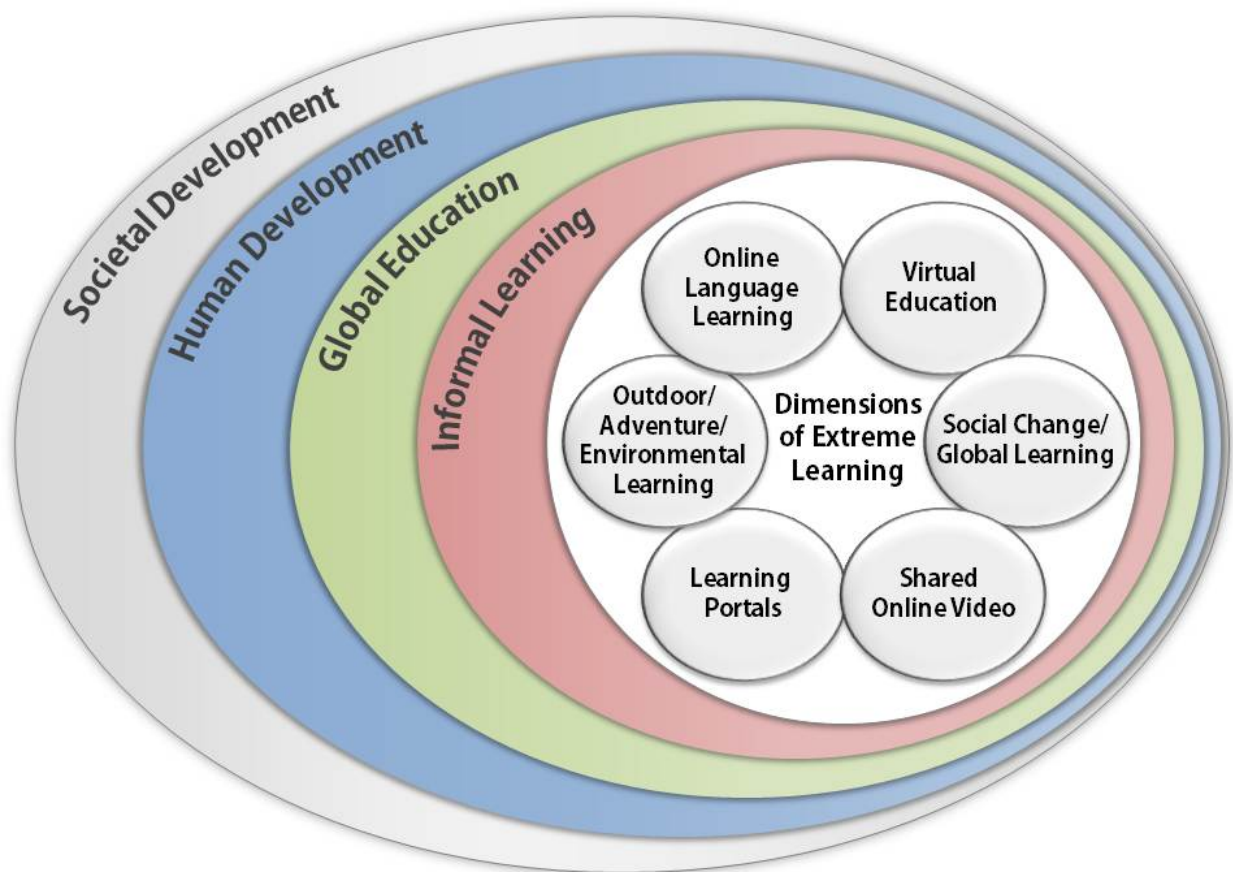
In addition to adventure learning, online language learning Web sites have been proliferating in recent years (Kong, 2009). Web sites, such as Livemocha and Palabea provide free and rich language learning content, training activities, and multimedia support in multiple languages. Users are interacting with the content and providing their feedback and reflection via a variety of social networking tools within these Web sites. Yet, a number of scholars (Kartal & Uzun, 2010; Warschauer & Kern, 2000; Kong, 2009; Liu, Traphagan, Huh, Koh, Choi, & McGregor, 2008) point to a disconnection between the stated learning philosophy at such language learning sites and what language learners, teachers, and stakeholders are expecting from such resources.

We are living in an age of open education where anyone can now learn anything from anyone else at any time (Bonk, 2009b). Technology, when thoughtfully employed, can empower people. Such empowerment moments can offer purpose and meaning in one's life. Despite the life altering possibilities, minimal research exists on extreme learning to date. As such, there is a need to capture snapshots as well as longer views of human growth resulting from extreme teaching and learning situations.

### **Research Steps**

This project has a series of phases or subtasks. First an inventory of informal learning Websites will be recorded, categorized, and rated. Criteria for inclusion in this study include any learning or teaching involving technology that does not involve traditional schools or classrooms. Such situations might include teaching or learning from planes, trains, boats, space shuttles, mountain tops, submarines, cars, grocery stores, museums, zoos, cafes, bikes, mobile devices, battle zones, etc. They might come in the aftermath of a tsunami, earthquake, winter storm, hurricane, or tornado.

We have already conducted a content analysis of informal and extreme learning Websites. Based on our analysis of nearly 300 Websites collected by the “Extreme Learning Research Team” at Indiana University (IU), these sites were placed into six categories: 1. Online language learning; 2. Adventure learning and environmental education; 3. Social change and global education; 4. Virtual education; 5. Learning portals; and 6. Shared online video. Figure 3 provides a visual representation of these six extreme learning categories.



**Human activity system for understanding the impact of Extreme Learning**

Figure 3. A visual representation of the dimensions and impact of extreme learning.

Each Website was analyzed according to eight criteria: (1) content richness, (2) functionality of technology, (3) extent of technology integration, (4) novelty of technology, (5)

uniqueness of learning environment/learning, (6) potential for learning, (7) potential for life changing, and (8) scalability of audience (Jung, Kim, Wang, & Bonk, 2011). Ratings were made on each Web site based on the eight criteria using a 5-point Likert scale (1 is low; 5 is high) (see Appendix A).

### **Sample of Websites and Online Resources by Extreme Learning Category:**

1. **Online Language Learning Sites:** Babbel, Livemocha, ChinesePod, English Central, BBC-Languages, Mixxer, SpanishPod, Voxopop, Kan Talk, Ling, Vocab Sushi, InterPals.
2. **Outdoor/Adventure Learning:** Polar Husky, Earthducation, the Last Ocean Project, Impossible2Possible, Roadtrip Nation, Explo.tv, Explorers Web, Nautilus Live.
3. **Social Change/Global Education:** The Flat Classroom Project, Link TV, Soliya, ePals, iEARN, Free Rice, MGDFive.com, Infinite Family, Omnium Extension Projects.
4. **Virtual Education:** Encyclopedia of Life, Khan Academy, British Library Turning the Pages, Curriki, MERLOT, Connexions, Open Yale, Wolfram Alpha, MIT OCW, Sophia, Peer 2 Peer University, About.com, Squidoo, Smithsonian.
5. **Learning Portals:** Jane Austin, Einstein, Shakespeare, Charles Darwin, Jane Goodall Institute, Edgar Alan Poe,
6. **Shared Online Video:** Link TV, Book TV, Current TV, YouTube EDU, School Tube, Big Think, Fora.TV, Clip Chef, Wonder How To, Howcast, TV Lesson, MIT World, Academic Earth, BBC Video Nation, CNN Presents, History for Music Lovers.

Highly ranked websites will be chosen for more detailed analysis to show how the features displayed at these websites offer experiential, engaging, effective, and enhancing learning experience to encourage learning and empowerment. As such, this project intends to evaluate the quality of a wide range of online learning resources, projects, and activities from the casual informal to the highly extreme forms of learning. Given pervasive clamor about online learning quality, the evaluation criteria should prove usable to informal and extreme learning project and Website funders, developers, and users.

In addition to the evaluation criteria, we hope to create a highly functional and easy-to-navigate Website with hundreds of informal and extreme learning resources. When complete, users will become aware of the wide range of learning formats and options available today. We intend for the Extreme Learning Website (<http://www.extreme-learning.org/>, see Figure 4) to become a free and open resource connecting millions of potential learners and teachers around the planet. No such resource presently exists. In addition to standard Web-based access and sharing on a desktop or laptop computer, it will allow for mobile Web-based sharing of stories of life change with technology.



Figure 4. Extreme Learning Website.

As noted earlier, besides this content analysis, there are a series of surveys of educators and learners involved in extreme learning pursuits. These surveys will provide insight into how learners access and use such resources. At the same time, the types of materials, tools, and resources they are searching for will be revealed. In addition, our research will document the successes as well as obstacles to their use. These may vary for online language learners, those involved in adventure learning, environmental education, virtual education, and global collaboration. Follow-up interviews and focus groups should lend greater insight into this emerging area called extreme learning. In the end, we intend to document special moments in the



learning process where some type of life change took place, at least in part, due to the learning technology or resource employed. Educators and developers involved will be interviewed. Extreme learning will also be interviewed.

### **Extreme Learning HOPES and DREAMS**

This is a project about “hopes” and a project about “dreams.” Everyone needs hopes and dreams. Let’s call it the “Extreme Learning HOPES and DREAMS” project. This is a project tugging at the extreme edges of teaching and learning. Millions of individuals are bored or not engaged in their learning. Millions more are not content with their present job situation. Still others have no access to education at all. They have lost hope and they have lost their dreams. At the dawn of the twenty-first century, emerging technologies for learning have the potential to change all that. Countless individuals are learning today in ways they never thought possible. As they do, these same learners are finding new careers and professional interests. They are in the midst of life changing experiences through innovative use of online technology tools and open educational resources. The Extreme Learning HOPES and DREAMS project is a natural outgrowth of such times; the technology has arrived to alter such personal as well as professional situations and empower learners and educators in ways never before imagined.

As part of this project, we are attempting to record “empowerment moments” wherein people lives, and, in effect, their identities, were changed due to their use of technology. During the coming months and years, we intend to document human development and growth as it pertains to life changing moments involving learning technology. The world is open for learning and it is time to collect human interest stories that prove it and are an inspiration to others. We

will do this in the Extreme Learning HOPES and DREAMS project. A representation of the HOPES storytelling system is in Figure 5 below.

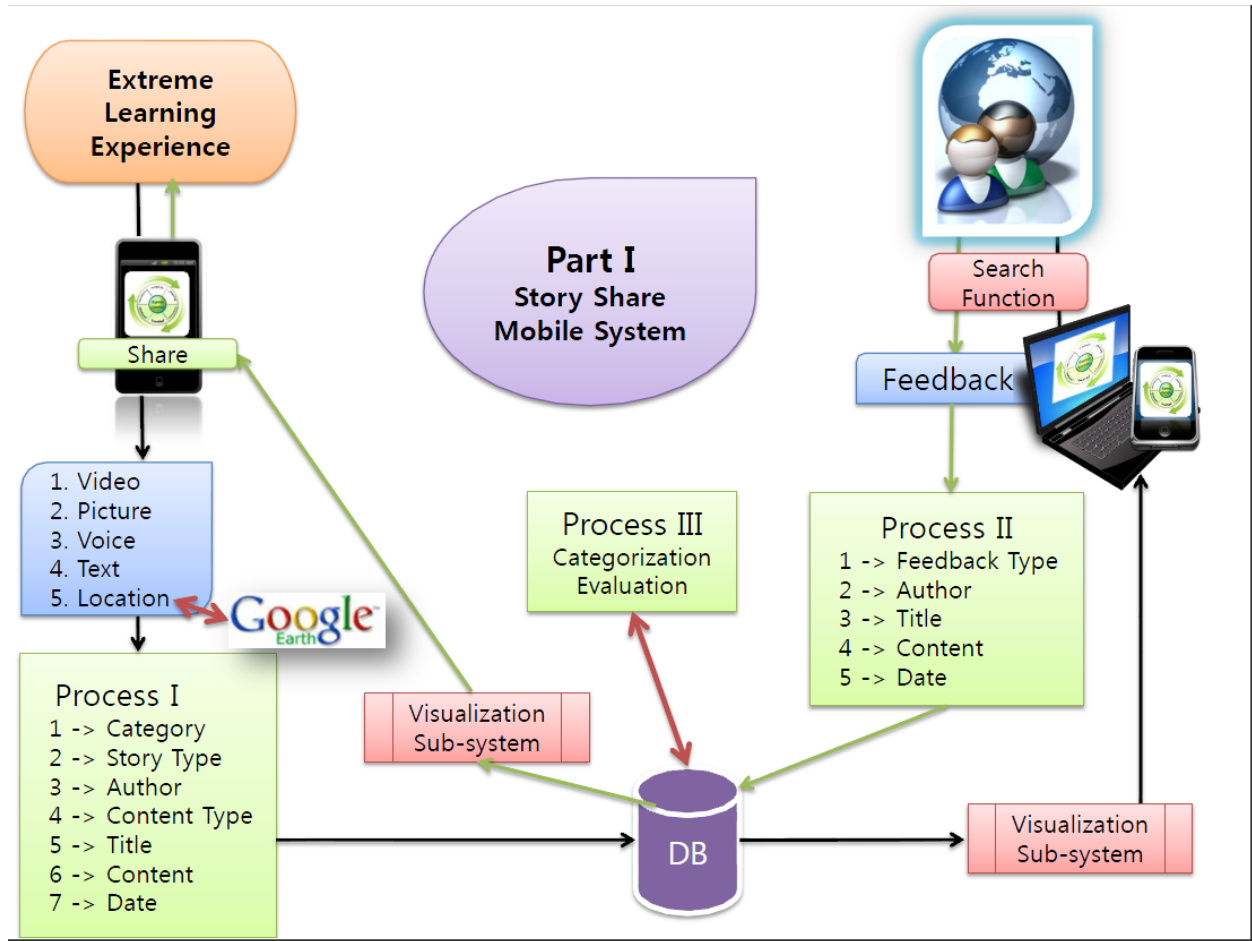


Figure 5. Depiction of the story sharing process in the HOPES system (i.e., *Humanity's Open Platform for the Exchange of Stories*).

Extreme Learning HOPES and DREAMS will characterize the ways people learn with open technology under unconventional conditions. Although casual or everyday learning signals the value of informality in learning experiences, more extreme situations that stretch beyond traditional educational contexts (e.g., trains, boats, and war zones) and situations (e.g., aboriginal youth in remote parts of Australia, indigenous populations in Peru, disadvantaged youth in Kenya, etc.) represent unexamined possibilities for cyberlearning that the project pursues

through two lines of inquiry. First, “*Humanity’s Open Platform for the Exchange of Stories*” (HOPES) will enlist a cyberinfrastructure to organize a platform and suite of narrative tools for both Internet- and mobile-based storytelling. HOPES enables people to share personal stories of life change and learning with technology, particularly through informal learning pursuits (see Figure 6 for sample story).



Figure 6. Sample extreme learning life-changing story from the Michigan Virtual University

As noted in Figure 7, each story will be meta-tagged and searchable. Direct comments or quotes from each story can be used to inspire others to similar learning quests and journeys. Teachers might be able to use them to illustrate cultural differences and similarities in student learning needs and opportunities as well as in educational systems in general.

**Students need to know that these things are available.**

By: Ad Admin (admin)

Quote Show all quotations  
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Click the "Quote" button to add the selected text to "Quotation"

	OCW
<b>places</b>	Nigeria
<b>peoples</b>	Kunle Adejumo
<b>time</b>	2008-2009
<b>url</b>	http://ocw.mit.edu/about/ocw-stories/kunle-adejumo/

Kunle Adejumo is a Nigerian engineering graduate who studied at Ahmadu Bello University in Zaria, Nigeria. He is the fifth and final child of his parents. He has a degree in engineering from Ahmadu Bello University in Zaria, Nigeria.


Established in 1952, Ahmadu Bello is Nigeria's largest university, with 35,000 students. Though the university boasts a large and well-maintained physical infrastructure, its Internet access – like that of almost all Nigerian universities – is extremely limited.

Even the computer lab does not have a Web connection.

And because of the large number of students and the limited number of terminals, students can sign up for only 20 minutes each week on university computers.

**Getting access**

When Adejumo was first introduced to MIT OpenCourseWare through a CD-ROM in the university computer lab he had only 20 minutes to look through the material. Impressed with the content, he asked the computer lab for a copy of the CD; when they were unable to give him one, Adejumo decided to find the site on his own, and copied down the Web address.



From his home computer, he has enjoyed regular access to OCW, and has used it to complement the course materials he has gotten through Ahmadu Bello.

Figure 7. Sample tagged and searchable story of extreme learning from MIT

Second, the “*Design Research for an Engaging and Active Mobile System*” (DREAMS) will leverage the HOPES platform to systematically examine Internet resources and their mediating effects on extreme learning experiences. In effects, DREAMS is our research plan (see Figure 8). DREAMS will expand preliminary studies that have already generated an eight-part analytical scheme mentioned earlier. In our initial years, DREAMS will focus on extreme learning with respect to social change and global education in order to establish a proof of

concept—where possible with marginalized populations—while expanding into an additional area such as online language learning, virtual education, and adventure learning later. By collecting and cataloguing stories of life change in various areas or categories of extreme learning using surveys, interviews, focus groups, and document analyses, DREAMS will reveal insights into the ways people utilize extreme learning resources and tools.

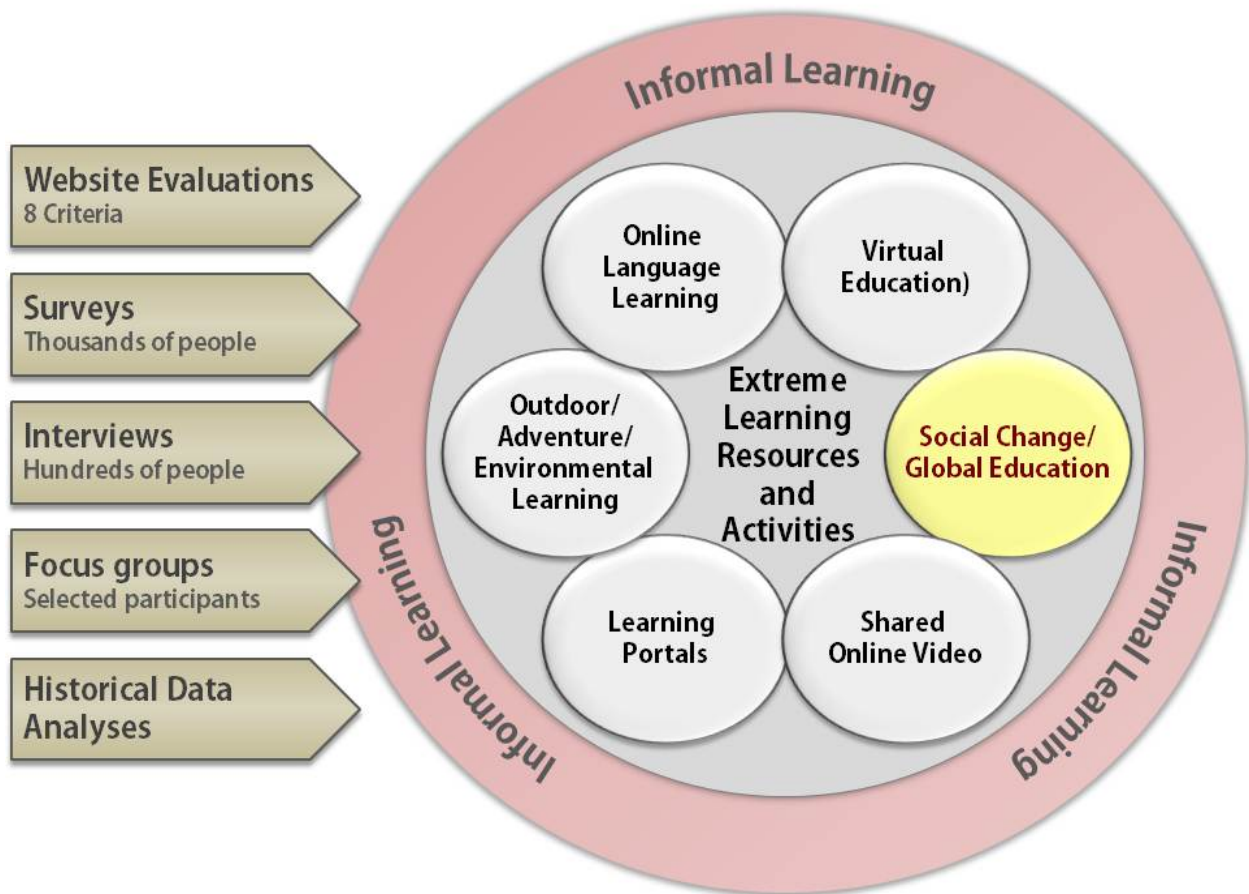


Figure 8. Extreme Learning Research plan (DREAMS: Design Research for an Engaging and Active Mobile System)

Without a doubt, Web technology provides immense opportunities for people to learn anywhere, anytime, and from anyone. As a result, learning is often enhanced to some degree and

life is changed. But research on how Web-based extreme learning has engaged learners and provided unique opportunities is relatively sparse.

A key aspect of this study is to understand how online technology can motivate someone to learn or to teach outside of traditional school settings. We intend to record atypical or nontraditional ways that people are learning online today. We hope that this will inspire others to continue to learn across their lifespan. We also want to record moments wherein technology empowered someone or provided a peak or highly interesting learning experience.

### **Extreme Learning Mission and Goals**

We expect that this project can broadly impact ideas about human learning in the twenty-first century. We expect that the resources and stories generated by this project will spur discussion of when, where, and how learning occurs. As part of these efforts, we hope to impact cultural awareness and global perspective taking. These stories will be available for anyone in the future wishing to understand teaching and learning at this point in history. At the same time, they will serve to inspire both teachers as well as learners. Instructors, for instance, should find a rich store of ideas on how to teach with technology. Learners should begin to grasp that they have untold educational opportunities today. And such opportunities can be narrowed to a specific learning path or goals beneficial to each person.

There are many short-term and long-term goals of the Extreme Learning project. Among them are the ten listed below.

1. **Learner Recognition:** Learners whose stories are spotlighted will gain recognition and self-confidence. As such content proliferates and people become more familiar with and accepting of it, self-selected informal learning may be the norm in the coming decade.
2. **Role Models and Career Awareness:** The cases will serve as role models and goals for countless learners, young or older. The database of learning cases can help potential students find interesting educational paths to follow.
3. **Multicultural and Diversity Awareness:** Raised awareness of different learning needs and situations within and across cultures; similarities as well as differences in skill needs, technology support tools, and learning goals can be shared.
4. **Quality Evaluation Criteria:** Quality indicators of extreme learning resources, projects, and activities can help designers and users.
5. **Instruction Ideas:** Instructors as well as learners will be able to access and search in our extreme learning cases database for examples of how to use different resources to learn or to teach. These instructors might also share pedagogical ideas with other professors and scholars.
6. **Books and Cases:** A set of high profile cases will be written to serve as inspirational models for others. We intend to turn some of the more interesting set of cases into a book of cases or perhaps even a wikibook of stories across cultures, learning situations, and ages.
7. **Historical Account of Learning:** The database will serve as a historical marker of the types and forms of learning occurring in the early portion of the twenty-first century.
8. **Extreme Learning Virtual Summit:** We will create an Extreme Learning virtual learning summit during this project. Each summit will be intended to inspire participants

to celebrate and share their stories of life change. During the summit, we will announce winners of the annual Extreme Learning awards and recognitions. A compilation or medley of participant interviews will make salient the many forms of extreme learning taking place around the globe today.

9. **Human Learning Rights:** If successful, this project helps promote learning as a national agenda and human right. It is hoped that a national, and perhaps even international discussion, can commence related human learning and open education. The Extreme Learning Website will also set examples and open discussions about educational possibilities and rights.
10. **Stretching the Edges of What Human Learning Is:** It is vital to understand the far edges of learning taking place on this planet given that what is extreme learning today might find its way into the norm of learning in the near future. Such learning takes place beyond more simple forms of blended learning with resource supplements to take into account the ways that can totally transform or rethink education.

### **Audiences and Final Remarks**

The above outcomes address many audiences. Among these audiences include policy makers making decisions about the coming decades of educational funding and initiatives, learners seeking new degree programs, instructors seeking to enliven their teaching, digital scholars envisioning ways to share their expertise in large scale ways, and researchers and educators hoping to better understand the mix of resources that can positively enhance human learning. We are attempting to create a resource that can lead individuals to new learning vistas. In addition, we aim to document life changes that can serve as catalysts and benchmarks for



others to try out such resources. Imagine the new careers and, accordingly, the contributions that thousands of people could make with such an informal learning gateway.

It is vital to understand the far edges of learning taking place on this planet given that what is informal or extreme learning today might find its way into formal learning in the near future. With HOPES, we are attempting to create a set of resources that can lead individuals to new learning vistas. In addition, with DREAMS we aim to document life changes that can serve as a catalyst and benchmark for others to try out such resources. Imagine the many possible new careers, and, accordingly, the contributions that thousands of people could make with such an informal learning gateway. Web-based technologies are continuing to push the limits of learning and education. It is time to make sense of the more open and informal education opportunities in front of each of us with both our Extreme Learning HOPES as well as our DREAMS. In an age where global economics have become increasingly flatter, human learning is becoming much more open.

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## Appendix A. Extreme Learning Web Site Coding Scheme

No	Criteria	Definition	1 (Low)	2	3 (Medium)	4	5 (High)
1	<b>Content Richness</b>	This criterion deals with how much information the Website, resource, or project contains on the topic chosen, how adequately it fulfills the purpose of learning, and whether the information is credible and up-to-date or not.	The Website, resource, or project doesn't contain much information on the topic chosen, and doesn't adequately fulfill the purpose of learning. The information is not credible or is out-of-date. There are few resources providing access to learning content; it may appeal to different learning preferences or styles.	-	The Website, resource, or project contains less information on the topic chosen, and fulfills the purpose of learning to some extent. The information is somewhat credible or is up-to-date. There are some resources providing access to learning content; it may appeal to different learning preferences or styles.	-	The Website, resource, or project contains much information on the topic chosen, and adequately fulfills the purpose of learning. The information is credible and up-to-date. There are a wide range of resources providing access to learning content; it may appeal to different learning preferences or styles.
2	<b>Functionality of Technology</b>	This criterion deals with the ease of access, navigation, and use of the Website, resource, or project and whether it contains effective and appropriately employed technology to serve the stated learning purpose.	The Website, resource, or project is difficult to access, navigate, and use and contains ineffective technology for the stated learning purposes of potential users.	-	The Website, resource, or project is relatively intuitive or easy to access, navigate, and use and contains somewhat effective and appropriately employed technology to serve the stated learning purposes of potential users.	-	The Website, resource, or project is extremely intuitive and easy to access, navigate, and use and contains highly effective and appropriately employed technology to serve the stated learning purposes of potential users.
3	<b>Extent of Technology Integration</b>	This criterion deals with the range, amount, and types of technologies employed including issues of interaction, collaboration, and information collection, contribution, and community through such technology.	The Website, resource, or project contains few technologies for learning. Technology tools are not interactive, collaborative, or participatory and do not promote communication or sense of community. User contribution is limited or nonexistent.	-	The Website, resource, or project contains some range of technologies for learning. Technology tools are moderately interactive and collaborative and might enhance information exchange or user communication and contribution.	-	The Website, resource, or project contains a wide range and amount of technologies for learning. Technology tools are highly interactive and collaborative and can greatly promote information collection and dissemination as well as user communication and contribution.

4	<b>Novelty of Technology (Coolness Factor #1)</b>	This criterion deals with whether the Website, resource, or project contains emerging, unusual, or novel technologies.	There is no experimentation with emerging, unusual, or novel technologies for learning and the technologies which are used are out-of-date.	-	There is some experimentation with emerging, unusual, or novel technologies for learning which might motivate or engage potential users/learners.	-	There is extensive experimentation with emerging, unusual, or novel technologies for learning; some of which is quite exciting, motivating, or appealing for potential users/learners.
5	<b>Uniqueness of Learning Environment / Learning (Coolness Factor #2)</b>	The Website, resource, or project serves the purpose of learning in a non-traditional, unique, or extreme learning environment, which is highly different from traditional classroom settings.	The Website, resource, or project is just a replication of formal or traditional school-based learning. The learning is essentially what the user or learner might experience in a traditional teaching or training situations. The Website, resource, or project might be rather plain or unappealing to the potential learner or user; it is one of dozens of such sites.	-	The Website, resource, or project is somewhat unique or different from traditional learning. There are learning opportunities that are somewhat novel or hard to find in formal or traditional settings. The Website, resource, or project makes an attempt to connect people to each other as well as to novel resources and activities and current information not easily found in books or other traditional learning resources. There is also some room for creative expression of the users.	-	The Website, resource, or project is unique or different. There are learning opportunities that are novel or hard to find in formal or traditional settings. The Website, resource, or project connects people to each other as well as to novel resources and activities and current information is not easily found in books or other traditional learning resources. There is also extensive room for creative expression of the users.

6	<b>Potential for Learning</b>	This criterion deals with whether the Website, resource, or project enables and provides learning activities or learning opportunities for the target audience to achieve the intended learning goals. There might be many markers, targets, or goals for such learning as well as celebration of those who have completed one or more learning-related units, activities, or segments. Such markers might come in the forms of self-tests, discussions, reviews, interactions, etc. or various rich media resources. The paths for learning are varied and extensive.	The Website, resource, or project enables and provides few learning activities or opportunities for the target audience to achieve the intended learning goals. There are extremely limited markers, targets, or goals for such learning and limited acknowledgment related to those who have completed one or more learning-related units, activities, or segments (i.e., self-tests, discussions, reviews, interactions, etc. or various rich media resources). The paths for each learner may be not unique. There may be few ways to socially network or collaborate with others at the Website, resource, or project.	-	-	The Website, resource, or project enables and provides the potential for learning activities or learning opportunities for the target audience to achieve most or all of the intended learning goals. There might be markers, targets, or goals for such learning as well as celebration of those who have completed one or more learning-related units, activities, or segments (i.e., self-tests, discussions, reviews, interactions, etc. or various rich media resources). The paths for each learner may be highly unique. There may also be ways to socially network or collaborate with others at the Website, resource, or project.
7	<b>Potential for Life Changing</b>	This criterion deals with whether the Website, resource, or project influences or improves the quality of life and extends or changes the perspective of the world for the intended audience. As part of this, there is potential for individuals to experience life changing or empowerment moments from the use of the Website, resource, or project.	The Website, resource, or project does not offer much in the way of improving or influencing the quality of life or the perspective of the world for the intended audience. The impact is quite narrow or limited. Users might not gain anything beyond basic skills.	-	-	The Website, resource, or project significantly influences or improves the quality of life and extends or changes the perspective of the world for the intended audience. People are empowered to learn in ways that change their lives or broaden their outlook, perspectives, or knowledge and competencies. They can connect to other people or to knowledge and information in many ways previously unseen or seldom experienced.



					experienced previously.		
8	<b>Scalability of Audience</b>	This criterion deals with the potential impact of the Website, resource, or project including the possibility to broaden the size and scope of its potential intended audience.	The Website, resource, or project has a narrow focus or does not have wide appeal or potential impact. The intended or actual audience is quite limited.	-	The Website, resource, or project has the potential to impact many people or a somewhat wide audience. It might have relevance to several different audiences or types of users.	-	The Website, resource, or project has high possibility to impact a broad audience or large scale and scope from one or more educational sectors (e.g., K-12, higher education, corporate, government, non-profit, or informal).