

**Finding Anything Extreme?:  
Analyzing the Learning and Development Potential of Extreme Learning Websites**

Minkyong Kim  
Indiana University, Bloomington  
kimmink@indiana.edu

Eulho Jung  
Indiana University, Bloomington  
euljung@indiana.edu

Abdullah Altuwaijri  
Indiana University, Bloomington  
aaltuwai@indiana.edu

Yurong Wang  
Indiana University, Bloomington  
yurwang@indiana.edu

Curtis J. Bonk  
Indiana University, Bloomington  
cjbonk@indiana.edu

**Abstract:** The advancement of learning technology during the past decade or two has broadened the possibilities for online learning both in formal as well as informal settings. With a focus on the latter, research in extreme learning explores how people learn or teach with technology in unusual or unique ways outside of traditional educational settings. The purpose of this research, therefore, is to offer some insight into where and how the use of cutting-edge educational technology actually takes place and may result in changing people's lives. Researchers collected and evaluated 305 extreme learning websites under six main categories using 8 structured criteria. The results for different types of extreme learning are compared. In addition, the top 25 rated extreme learning Web sites are introduced.

### **Introduction**

Extreme learning is related to informal and non-traditional learning. Extreme Learning is defined as learning on the Web in unusual or nontraditional ways with technology (Bonk, 2012). This includes learning with technology when in a park, plane, train, boat, car, or hospital or when climbing a mountain, in a war zone, or taking a vacation on a remote island (Bonk, 2009). Extreme learning involves not just learning, but also how people 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. One's teachers, guides, and mentors can now come from extreme environments such as Arctic regions, as well as those involved in social change causes while running across the Sahara Desert.

At the other end of the continuum, extreme learning can include more sedate and passive forms of learning including watching an online video in TED, LinkTV, CurrentTV, or YouTube (Bonk, 2011). Through extreme learning 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 OpenCourseWare 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. And, as many are aware, there are tens of thousands of people earning their MBA and other degrees and certificates while in war zones in Iraq and Afghanistan or while located on military bases around the world.

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

Decades of research on technology integration in schools and university settings as well as corporate and military training have rarely explored issues of human development and change. Most often, such research is conducted in a local or extremely narrow educational setting. In response, this research project takes a broader and more global or borderless perspective. Given the educational potential of extreme learning, this study was designed to uncover essential characteristics of successful online resources related to more unusual or extreme forms of learning. Specifically, this research is to identify the high quality extreme learning Websites based on six categories: (1) language learning, (2) outdoor/adventure learning, (3) social change/global learning, (4) virtual education, (5) learning portals, and (6) shared online video.

## **Literature Review**

Internet technology changes the way people learn as well as the learning environments for that learning. There are myriad opportunities for personal as well as collaborative learning. Zaidel and Lou (2010) indicated that personalizing the learning process using the Internet can enhance student performance on academic tasks. Other researchers (Kartal & Uzun, 2010; Kong, 2009; Warschauer & Kern, 2000) contend that Web resources and services provide opportunities to vastly improve the learning experience. They argue that presenting the learning content according to one's needs and preferences profoundly impacts learning targets.

Adventure learning, a form of non-traditional learning, is defined as "an approach to the

design of online and hybrid education that provides students with opportunities to explore real-world issues through authentic learning experiences within collaborative learning environments” (Veletsianos & Klanthous, 2009, p.85). Doering and Veletsianos (2008) pointed out that “the adventure learning approach is to design, development, and ultimately learning is based upon the understanding that experience rather than osmosis guides meaningful learning experiences” (Doering & Veletsianos, 2008, p.25). Adventure learning provides students with experiences that are exciting, engaging, motivational, and authentic via the implementation of problem-based tasks (Miller, Veletsianos, & Doering, 2008). While AL offers a starting point for the field of extreme learning, Veletsiano and Klanthous (2009) identified only eleven published papers on adventure learning. Clearly, much more research needs to be conducted and shared.

During the past decade, the forms of learning delivery and opportunities to learn have exploded. Many are still in search for new discoveries and learning truths in the traditional learning environment or subject matter areas. However, learning is increasingly informal and self-directed or self-selected. For instance, Cross (2007) contends that more than 80 percent of learning is currently informal. Given the explosion of open educational resources and free curriculum materials found online, it is reasonable to believe that such informal learning numbers will increase in the coming decades (Cross, 2007). A wide range of Web tools, resources, and activities now allow one to learn from on demand and just when needed. A number of disciplines including online language learning, basic skill rehearsal, global education, social change, adventure, and environmental education have propelled the past few years. To properly prepare learners for the twenty-first century, educators are increasingly calling for global education activities and curricula (Longview Foundation, 2008; Merryfield, 2007, 2008; Merryfield & Kasai, 2009; Riel, 1993).

Despite the growing attention in extreme learning, scant information exists about those using technology tools and resources to teach in unusual or nontraditional ways. Currently, there are thousands of online educators offering their services for free online to help others around the world learn languages, vocabulary, geography, mathematics, and many science-related disciplines. More interestingly, many instructors find their teaching opportunities reside in unusual environments like on a boat, car, airport concourse, dogsled, or café (Bonk, 2009).

## **Methodology**

The list of extreme learning Web sites was developed through two stages. First, a team of over a dozen researchers located, shared, reviewed, and evaluated potential extreme learning sites for a year in order to determine the current state of possible extreme learning websites. After that, a subgroup of four researchers rated 305 of these Web sites using an eight-part coding scheme. This coding scheme was developed by the entire research team based on a set of technology features and instructional resource characteristics found in the research literature (see Appendix A; Jung, Kim, Wang, & Bonk, 2011).

Members used different methods for locating extreme learning sites including subject-matter expertise, Web searches, scanning books, blog posts, technical reports, and soliciting expert recommendations in order to develop a list of informal learning websites. The resulting list of resources was categorized six areas: (1) language learning, (2) outdoor/adventure learning, (3) social change/global learning, (4) virtual education, (5) learning portal, and (6) shared online video (See Figure 1). While each Website was placed in only one of these six categories, there certainly is overlap in these dimensions. For instance, some social change resources also offer virtual education and shared online video.

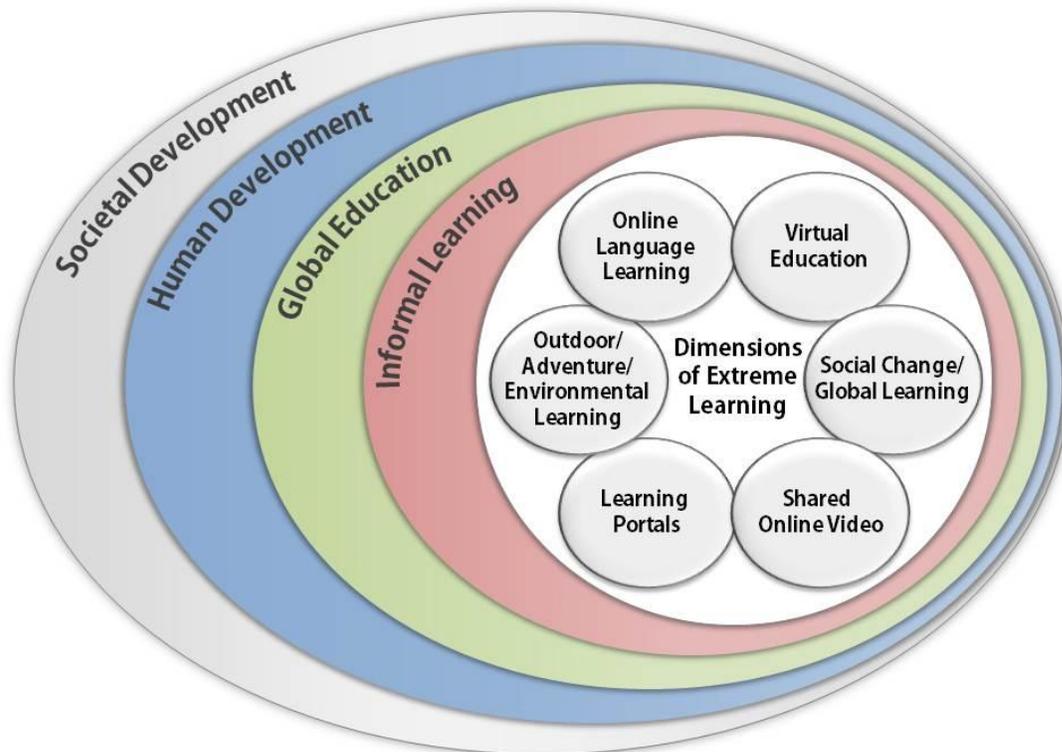


Figure 1. A visual representation of the dimensions and impact of extreme learning

Still, we defined each category distinctly (see Appendix B). For instance, as detailed in Appendix B, online Language Learning refers to technology-aided language learning with an integration of sound, voice interaction, text, video, and animation.

Adventure/Outdoor Learning is a hybrid online educational environment that provides students with opportunities to explore real-world issues occurring in particular regions or places on this planet. In contrast, Social Change/Global seeks to educate and inform people about issues and needs related to social change, including poverty, hunger, AIDS, civics etc. Another category, Virtual Education, refers to learning environments where teacher and student are separated by time or space, or both, and where there may be formal educational activities or credits attached to any learning taking place within; however, it such education may also be informal or self-paced. Learning Portals refer to centralized learning centers or repositories that contain an aggregation of educational information on a topic, often current or continually updated. Lastly, Shared Online

Videos are any educational videos such as YouTube or other Webstreamed videos that can be watched or shared at any time and by anyone with an Internet connection; many can also be downloaded and watched off-line.

After much fine-tuning, the final version of the evaluation criteria include eight areas: (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. Ratings were made on each Web site through multiple phases based on the eight criteria using a 5-point Likert scale (1 is low; 5 is high). Given the use of four raters, a statistical measure of internal consistency, namely, Cronbach's alpha was performed to determine the consistency among them. The alpha coefficient for the four items was .744, suggesting that the items had acceptable internal consistency.

## **Result and Discussion**

### ***Research significance***

This research offers insights into where and how cutting-edge educational technology takes place in authentic learning environments; especially that occurring outside conventional perspectives of learning contexts. Furthermore, by categorizing and evaluating hundreds of extreme learning Web sites, educators should begin to fathom the potential of extreme learning.

### ***General Findings***

To date, four researchers have evaluated 305 websites using the scale. The Web sites evaluated were composed of 63 language learning, 51 outdoor and adventure learning, 57 social change and global learning, 57 virtual education, 38 learning portals, and 39 shared online video. As Table 1 indicates, the shared online video category scored the highest rating (3.25), whereas the social change and global learning category was rated the lowest (2.68). Overall, the criteria related to the potential for learning (3.15) was rated as the highest. In contrast, the novelty of technology was rated as the lowest category (2.66).

### ***Findings with criteria***

Further analysis was conducted based on the eight criteria. As Table 1 reveals, virtual education was identified as the highest in the richness of its content (3.4). Not surprisingly, it is reasonable that the virtual education Websites contain the most credible and up-to-date knowledge considering that most virtual education websites are managed by accredited academic institutions. Outdoor and adventure learning received the highest score in terms of the uniqueness of the learning environment and learning (3.7). High scores in this criterion is a signal that much non-traditional, unique, or extreme learning environment is possible. Outdoor sites, of course, take learners outside normal classroom settings and experiences. It is interesting to find that across all rated sites, the novelty of technology was deemed low (2.66). This result implies that emerging and cutting-edge

technologies are not typically employed for nontraditional educational purposes. Of course, such a finding runs counter to prevailing notions that the latest technology naturally penetrates into our daily life outside of traditional educational settings.

Table 1.

*Average Website rating according to extreme learning criteria and category*

Criteria	Categories (Number of website)						Average (Total 305)
	Language Learning (63)	Outdoor / Adventure learning (51)	Social Change / Global (57)	Virtual Education (57)	Learning Portals (38)	Shared Online Video (39)	
1. Content Richness	2.9	2.9	2.5	3.4	3.2	3.4	3.05
2. Functionality of Technology	3.1	2.9	2.6	3.2	2.8	3.4	3.01
3. Extent of Technology Integration	2.9	2.8	2.6	3.1	2.7	3.2	2.86
4. Novelty of Technology	2.7	2.6	2.4	2.8	2.5	3.0	2.66
5. Uniqueness of Learning Environment / Learning	2.8	3.7	2.8	2.9	2.6	3.2	3.00
6. Potential for Learning	3.1	3.3	2.8	3.4	2.9	3.4	3.15
7. Potential for Life Changing	2.6	3.1	2.9	3.1	2.5	3.1	2.90
8. Scalability of Audience	3.1	2.8	2.7	3.3	3.0	3.4	3.04
Average	2.89	3.01	2.68	3.15	2.76	3.25	2.96

### *Findings with categories*

Detailed results are shown as follows for all categories of extreme learning.

**1. Language Learning:** Given that functionality of technology received the highest rating, technology interactivity and support seems to be one of the most-valued factors in language education. The average score of the language learning category (2.89) reveals scores without much fluctuation in terms of the average score in each criterion. In language education websites, the highest score on potential for learning (3.1) and the lowest score was on potential for life changing (2.63). Four language learning Web sites were selected as top rated Websites, including BBC Learning English, ChinesePod, EnglishPod, and Live Mocha.

**2. Outdoor and Adventure Learning:** We also explored outdoor and adventure learning. This category was tied with virtual education for the highest average overall score (3.01). The highest score for outdoor and adventure learning was on the uniqueness of the learning environment/learning (3.65) and the lowest score was in regards to the novelty of technology (2.57). This finding is parallel to the general notion in which adventure learning is effectively promoted by providing authentic learning environments. Four Web sites in this category were selected as top rated Websites. These included Earthducation, Explore, Jon Bowermaster, and Nautilus Live.

**3. Social Change and Global Learning:** Most of criteria's scores on the social change

and global learning category were below the average scores across all Web sites; the scores in all categories were below the average (2.96). The highest score (2.93) was on potential for life change. Such findings were attributed to the different nature of social change and global learning category. In effect, one of the common features of social change Websites include being inspirational and motivational, rather than directly providing educational materials. Only one Website was selected as top rated web sites in this category, namely, iCivics.

**4. Virtual Education:** Taking into consideration that many open learning resources include Websites such as the popular MIT OpenCourseWare project which are free and open to the public, the high score in potential for learning (3.39) and content richness (3.39) were not too surprising. We believe that the low score on novelty of technology (2.82) was impacted by the fundamental role of virtual education Websites. Nine Virtual Education Websites were selected as top rated. These sites included Ed Tech talk, the Florida Virtual School, John Hopkins OpenCourseWare, Khan Academy, MIT OpenCourseWare, MIT OpenCourseWare Highlights for High School, NASA for Educators, Open University UK-OpenLearn, and the Smithsonian.

**5. Learning Portal:** We also rated the Learning Portal Websites. Overall, the highest score of this category was on the content richness (3.19) and the lowest score was on the novelty of the technology (2.49). Only one Website was selected as top rated Websites, namely MERLOT.

**6. Shared online video:** Considering many online lectures and programs are delivered through video channels and that many high production news broadcasts are now available on the Web for millions of potential viewers, it seems reasonable that Shared Online Video had the highest overall score (3.25). Specifically, the highest sub-category of this category is on the Functionality of Technology (3.41) and the lowest score was on novelty of technology (3.00). Six Websites were selected as top rated. These sites included Academic Earth, Discovery News Video, Explo.tv, Link TV, National Geographic Education, and Wonder How To Videos.

### *Characteristics in highly rated websites*

In order to analyze the common characteristics of highly rated Websites, we listed the top 25 Websites by average scores (see Table 2). Among them, there were four in the Language learning category, four in Outdoor/adventure learning, one in Social Change and Global Learning, nine in Virtual education, one in Learning Portals, and six in Shared Online Video. Most of the higher-scoring Websites received high ratings on functionality of technology and extent of technology integration. Such results reveal the importance of proper design of extreme learning technology resources for educational purposes. In addition, among the eight criteria, content richness (4.11), functionality of technology (4.32), and potential for learning (4.17) are the highest rated dimensions across all the extreme learning Websites evaluated in this study (see Table 3).

Table 2.  
*Top 25 Rated Learning Websites*

Categories	Websites
Language Learning	<ul style="list-style-type: none"> <li>▪ Live Mocha (<a href="http://www.livemocha.com/">http://www.livemocha.com/</a>)</li> <li>▪ BBC Learning English (<a href="http://www.bbc.co.uk/worldservice/learningenglish/">http://www.bbc.co.uk/worldservice/learningenglish/</a>)</li> <li>▪ Englishpod (<a href="http://englishpod.com/">http://englishpod.com/</a>)</li> <li>▪ Chinese Pod (<a href="http://chinesepod.com/">http://chinesepod.com/</a>)</li> </ul>
Outdoor / Adventure learning	<ul style="list-style-type: none"> <li>▪ Earth education (<a href="http://lt.umn.edu/eartheducation/">http://lt.umn.edu/eartheducation/</a>)</li> <li>▪ Jon Bowermaster (<a href="http://www.jonbowermaster.com/">http://www.jonbowermaster.com/</a>)</li> <li>▪ Nautilus Live (<a href="http://www.nautiluslive.org/">http://www.nautiluslive.org/</a>)</li> <li>▪ Explore (<a href="http://www.explore.org/">http://www.explore.org/</a>)</li> </ul>
Social Change / Global Learning	<ul style="list-style-type: none"> <li>▪ iCivics (<a href="http://www.icivics.org/">http://www.icivics.org/</a>)</li> </ul>
Virtual Education	<ul style="list-style-type: none"> <li>▪ MIT OpenCourseWare (OCW) (<a href="http://ocw.mit.edu">http://ocw.mit.edu</a>)</li> <li>▪ MIT OpenCourseWare (OCW) Highlights for High School (<a href="http://ocw.mit.edu/high-school">http://ocw.mit.edu/high-school</a>)</li> <li>▪ Khan Academy (<a href="http://www.khanacademy.org">http://www.khanacademy.org</a>)</li> <li>▪ Open University UK-OpenLearn (<a href="http://www.open.ac.uk/openlearn/">http://www.open.ac.uk/openlearn/</a>)</li> <li>▪ Ed Tech talk (<a href="http://edtechtalk.com/">http://edtechtalk.com/</a>)</li> <li>▪ John Hopkins OpenCourseWare (<a href="http://ocw.jhsph.edu/">http://ocw.jhsph.edu/</a>)</li> <li>▪ NASA for Educators (<a href="http://www.nasa.gov/audience/foreducators/index.html">http://www.nasa.gov/audience/foreducators/index.html</a>)</li> <li>▪ Florida Virtual School (<a href="http://www.flvs.net/">http://www.flvs.net/</a>)</li> <li>▪ Smithsonian (<a href="http://www.si.edu/">http://www.si.edu/</a>)</li> </ul>
Learning Portals	<ul style="list-style-type: none"> <li>▪ MERLOT (<a href="http://www.merlot.org/merlot/index.htm">http://www.merlot.org/merlot/index.htm</a>)</li> </ul>
Shared Online Video	<ul style="list-style-type: none"> <li>▪ National Geographic Education (<a href="http://education.nationalgeographic.com/education/">http://education.nationalgeographic.com/education/</a>)</li> <li>▪ Academic Earth (<a href="http://academicearth.org/">http://academicearth.org/</a>)</li> <li>▪ Discovery News Video (<a href="http://news.discovery.com/videos/">http://news.discovery.com/videos/</a>)</li> <li>▪ Wonder How To Videos (<a href="http://www.wonderhowto.com/">http://www.wonderhowto.com/</a>)</li> <li>▪ Explo.tv (<a href="http://www.exploratorium.edu/tv/index.php">http://www.exploratorium.edu/tv/index.php</a>)</li> <li>▪ Link TV (<a href="http://www.linktv.org/">http://www.linktv.org/</a>)</li> </ul>

Table 3.  
*Top 25 Websites according to extreme learning criteria and category*

Criteria	Categories (Number of website)						Average (Top 25)
	Language Learning (4)	Outdoor / Adventure learning (4)	Social Change / Global (1)	Virtual Education (9)	Learning Portals (1)	Shared Online Video (6)	
1. Content Richness	3.94	3.63	4.50	4.22	5.00	4.17	4.11
2. Functionality of Technology	4.56	4.25	4.50	4.47	4.00	4.00	4.32
3. Extent of Technology Integration	4.19	3.94	4.25	4.03	4.00	3.79	3.99
4. Novelty of Technology	3.81	3.56	4.00	3.53	3.25	3.63	3.61
5. Uniqueness of Learning Environment / Learning	3.69	4.44	4.00	3.58	3.25	3.96	3.83
6. Potential for Learning	4.00	4.19	3.00	4.33	4.00	4.25	4.17
7. Potential for Life Changing	3.63	3.94	3.00	3.86	3.75	3.71	3.76
8. Scalability of Audience	4.13	3.56	3.50	4.36	4.25	3.92	4.05
Average	3.99	3.94	3.84	4.05	3.94	3.93	3.98

## Conclusions and Implications

Many interesting characteristics of extreme learning emerged from our analyses. In addition, our new eight-part coding scheme proved valuable in better understanding the learning potential of Web tools, materials, and resources that push toward the edges or extreme forms of human learning today. These criteria should prove helpful to others intending to conduct research in this field. As indicated, there are many variables that result in effective Websites for extreme learning. Such variables include content and technological richness as well as the scalability, novelty, and uniqueness of the technology and the learning activities taking place there. More specifically, it is important to offer ample bandwidth for shared online video in informal learning pursuits as well as in virtual education courses and programs. Such bandwidth as well as experimentation with emerging, novel, and “cool” learning technologies can also help in the development of authentic learning environments for outdoor and adventure learning as well as for the development and fine-tuning of virtual education and associated open educational resources. The incorporation of novel and emerging technologies also plays a role in the design and use of highly interactive resources from online language learning Websites as well as most any learning portal available today.

It is not too surprising that virtual education was the highest rated in terms of content richness, potential for learning, and scalability. That is what such services intend to do. Of course, as detailed in the press, there is much money being spent by for-profit as well as non-profit and government entities in this space today (Kaya, 2010). There is simply more demand for virtual forms of education today than ever before (Allen & Seaman, 2010; Project Tomorrow & Blackboard, 2011; Watson, Murin, Vashaw, Gemin, & Rapp, and colleagues at Evergreen Education Group, 2011). There is increasing recognition that both traditional (i.e., residential) and online education play important roles today (Milliron, 2010) and benefit learners with different backgrounds and circumstances.

In addition to our virtual education findings, most of our other findings seem logical. For instance, it makes sense that language learning sites incorporated the widest range of technology tools given that many of them offer premium accounts to members which cost money. While there are ongoing concerns about many of the instructional approaches (Clark & Gruba, 2010), we found many of these sites relatively easy to navigate, understand, and use. At the same time, the most unique ways in which technology was employed was found in adventure learning as well as in social change and global learning sites. Such findings would intuitively be expected from such sites given their motivational and emotional pull as well as the currency of activities and events found there. If you want to change your life or simply learn something but do not wish to pursue a degree, you might explore as well as participate in outdoor and adventure learning sites. Those hoping for a new career might explore virtual education as a potential life-changing event. Virtual education sites also offer the most in terms of human learning.

This is just a start. We will continue investigating additional Websites during the coming years. In addition, we will be interviewing participants in many of these sites about their learning gains and life changing experiences. Based on those results, focus groups will be

structured to clarify themes resulting from those interviews. We firmly believe that there is much that can be learned about those experiencing life and learning at the extremes.

The results of this research will help expose teachers, students, instructional designers, administrators, and other educational stakeholders to a wealth of learning resources and tools for both formal and informal education. The open educational world is expanding in many directions to offer unique learning paths and opportunities—from shared online videos of math and chemistry problems (Bonk, 2011; Khan, 2010) to high production news broadcasts. As we have seen, there are also highly engaging learning adventures from Antarctica to the Arctic North (Associate Press, 2011; Carter, 2010) and learning portals of every significant scientist, writer, politician, musician, etc., throughout recorded history as well as every discovered species on this planet (Managhan, 2011). Those developing such sites need to better grasp the key factors that can maximize the learning of users. And each year new technologies will continue to appear that can push the learning potential to even higher levels.

Those using these extreme learning tools and resources need to better grasp the learning potential. The stories we will be collecting during the coming years will serve as models or examples of the types of learning that are now possible in the twenty-first century. During this project, we intend to inspire others to learn in casual informal as well as more extreme forms of learning. This was just the first pass through these hundreds of learning resources. It is one marker or indicator of learning now possible. Our next passes will push and probe much deeper into the motivational and human development possibilities that now lie within our grasp. Stay tuned.

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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 some learning activities or learning opportunities for target audience to achieve some intended learning goals. There might be some 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 somewhat unique. There may also be some 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 somewhat influences or improves the quality of life and the perspective of the world for intended audience. People are somewhat 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 some ways that they might not have felt or experienced previously.	-	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.
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).

## Appendix B. Description of Extreme Learning Categories

- 1. Virtual Education** refers to learning environments where teacher and student are separated by time or space, or both. Course delivery can be through course management applications as well as various multimedia and Web 2.0 tools. Virtual education may be managed by organizations and institutions that have been created through alliances and partnerships to facilitate teaching and learning. Some virtual education websites provide learner services such as advising, learning assessment, and program planning (see Farrell & the Commonwealth of Learning, 2001).
- 2. Adventure Learning** is a hybrid online educational environment that provides students with opportunities to explore real-world issues through authentic learning experiences within collaborative online learning environments. Inquiry-based learning including teamwork, authentic data analysis, and project-based learning is encouraged (see Doering, 2006).
- 3. Language Learning** uses technology-aided language learning with an integration of sound, voice interaction, text, video, and animation. It empowers self-paced interactive learning environments that enable learners to achieve learning outcomes without being restricted to place or time. Often, such environments involve numerous opportunities for participation users and multiple methods for motivating their success. Online language learning often entails high levels of self-directed and reciprocal learning or supporting peer learning (see Ehsani, & Knodt, 1998).
- 4. Social Change/Global** seeks to educate and inform people about issues and needs relating to social change, including poverty, hunger, AIDS, civics etc. Technology is often used to create innovative ways to spread social good and access to learning worldwide. It is also used to empower and inspire people for the right cause.
- 5. Learning Portals** are centralized learning centers or repositories that contain an aggregation of educational information on a topic, often current or continually updated. Learners explore according to their own interest, time, and space. Learning portals support user and context learning, and are less centered on administration of that content and the results of the learning. .
- 6. Shared Online Videos** are any educational video (YouTube or other web streamed videos) that can be watched or shared. Some such sites offer syndicated programming and professional documentaries or filmmaking, whereas others are supporting by lay people. These sites often allow for interaction via comments and annotation. They often allow for downloading of content.