

TOWARDS A SUSTAINABLE OPEN AND DISTANCE LEARNING ENVIRONMENT

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ABSTRACT

Open and distance learning applications have evolved as a solution to circumstances where students rarely, or never, were able to have face-to-face or on-site access to educational facilities. Today, with the undeniable contribution of developing communication technologies, open and distance learning has become a unique system. A 'system' is a group of independent but interrelated elements comprising a unified whole to accomplish a predefined goal and the sustainability of this whole must not be neglected. Sustainable design can be summarized as the philosophy of designing the objects, environment and services to minimize, preferably totally overcome, the possible negative impacts of the system for both humans and the environment they live in. This paper aims to outline an input of sustainable design principles to the open and distance learning system.

The open and distance learning environments are designed virtual environments for real users. The users of these environments bring in their previously established learning and teaching habits. These habits may be gathered from both formal and informal experiences in virtual environments, or even only from the real world experiences. While designing the learning environments, these habits need to be understood, managed and thus, new ones would be built and presented. In situations where there is a coherence lack between built habits and the newly introduced functions in the environment a negative impact on user perception and performance may rise.

Sustainable design perspective, aiming to overcome negative impacts of the system for the environment and users, stands as an important reference in solving such problems.

INTRODUCTION

The concept of 'system' is a human creation; it is an attempt to understand the environment in which we live. Two important features of any system are; the possession of a subjective boundary and the continuity; boundaries are created to suit the purposes of analysis, discussion and understanding and continuity is a mark for the success of the created system. Hence, defining open and distance learning as a system helps understanding this environment, its boundaries and provisions for permanence.

The contribution of developing communication technologies together with the increasing demand due to changing living and working styles have enforced open and distance learning from being a supplementary solution to a unique system. It is a *system*; a group of independent but interrelated elements comprise a unified whole to accomplish a predefined goal. The *goal* is to deliver education to students who are not physically "on site" in a traditional classroom or campus by allowing self-determined, independent and interest-guided learning. It is *unique*, the learner is real and has *real* needs, the learning environment is *virtual*. This system could be successful if it becomes being continuous in space or time, hindering interruptions or disconnections. This is where sustainability becomes significant. The continuity of open and distance learning systems can not merely rely on advances in technology or the increasing 'consumer' demand; it has to be sustained for an indefinite period without damaging its own environment, without depleting resources and has to be renewable.

The Concept of Sustainability

This paper aims to draw attention to the sustainability of open and distance learning environments but before starting, it would be beneficial to refer to the meaning of the word 'sustain'. Visual Thesaurus, a web based interactive dictionary and thesaurus created by Thinkmap Inc. provides the following definition mapping for the word.

The same source lists the antonyms as; abstain, halt, discontinue and stop. As can be seen from the figure above, to 'sustain' is not only about keeping up, supporting or maintaining continuity but also is about nourishing, cultivation and acknowledgement.

The reflections of these definitions have formed the qualitative ground for explaining sustainability. Brundtland Report (1987) defined sustainability as

“meeting the needs of the present generation without compromising the ability of future generations to meet their needs” and Kim (1998) explains the concept as “the search for providing the best of all possible worlds for people and the environment both now and into the indefinite future” .



Figure 1: Synonyms for the word ‘sustain’ presented by Visual Thesaurus on the Web.

Maurice Strong, a Canadian businessman and one of the world’s leading supporters of the United Nations’ involvement in world affairs perceives sustainability as a business and within this perception, gives the definition as follows; “After all, sustainability means running the global environment - Earth Inc. - like a corporation: with depreciation, amortization and maintenance accounts. In other words, keeping the asset whole, rather than undermining your natural capital”.

Sustainability definitions have held the Earth - our planet and the Human - our lives as focal points for a long period of time. The concept itself has been a human concern from the earliest civilizations to the present, but has become popular at the post-World War II period when technology had become the determinant of economic growth and innovations like plastics, synthetic chemicals and nuclear energy were changing production and life styles. Popular books such as Silent Spring by Rachel Carson (1962) and The Population Bomb by Paul R. Ehrlich (1968) raised public awareness on the fact that there were environmental costs to be paid for obtaining material benefits and the quality of the environment was linked closely to economic development. Consumption of natural resources and the harm made by technology were major concerns.

The post modern society, unable to survive without technology, has altered the

periphery of the definition for sustainability; the Earth still is placed at the centre, moreover, contemporary concerns also envisage recognizing the impacts of every design and production choice on the natural and cultural resources of the local, regional, and global environments. The core of sustainability has now a broader boundary; paying attention to natural resources and changing values toward less consumptive lifestyles are important, and so are cultural resources and technology. Culture, society and human well being are also placed at the core, focusing on paying attention to knowledge sharing, global dimension recognition together with a commitment to local and/or cultural best practice. This new paradigm declares that every environment we live in has to be sustained; open and distance learning environments are no exception.

Principles of Sustainability

Sustainability does not mean a loss in the quality of life, but does force change in the way we think and our values. Many principles are presented and enforced by activists, legal institutions and NGO's. Sustainability is no longer limited to efficient use of natural resources or renewable energy; it is the whole concern on preservation and respect to the Planet, the Culture, the Society and the Human well being. Following are citations from reports which have shaped contemporary principles:

The 1987 Brundtland Report highlighted cultural, technological and human well being concerns by the following statements:

- Perceived needs are socially and culturally determined, and sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire.
- Sustainable development requires that societies meet human needs both by increasing productive potential and by ensuring equitable opportunities for all.
- A society may in many ways compromise its ability to meet the essential needs of its people in the future - by overexploiting resources, for example. The direction of technological developments may solve some immediate problems but lead to even greater ones.
- In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development; and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations.

In year 2000, sustainable design principles was presented named *Hannover Principles*. The City of Hannover had been designated as the site of the world exposition that year and the theme chosen was "Humanity, Nature, and Technology"

in order to address the issue of imagining and encouraging a sustainable future. The Principles were aimed to be considered by designers, planners, government officials and all involved in setting priorities for the built environment. The principles listed were as follows:

- Insist on the right of humanity and nature to co-exist in a healthy, supportive, diverse, and sustainable condition.
- Recognize Interdependence. The elements of human design interact with and depend on the natural world, with broad and diverse implications at every scale. Expand design considerations to recognizing even distant effects.
- Respect relationships between spirit and matter. Consider all aspects of human settlement in terms of existing and evolving connections between spiritual and material consciousness.
- Accept responsibility for the consequences of design decisions upon human well-being, the viability of natural systems, and their right to co-exist.
- Create safe objects to long-term value. Do not burden future generations with requirements for maintenance or vigilant administration of potential danger due to the careless creations of products, processes, or standards.
- Understand the limitations of design. No human creation lasts forever and design does not solve all problems. Those who create and plan should practice humility in the face of nature. Treat nature as a model and mentor, not an inconvenience to be evaded or controlled.
- Seek constant improvements by sharing knowledge. Encourage direct and open communication between colleagues, patrons, manufacturers, and users to link long-term sustainable considerations with ethical responsibility, and reestablish the integral relationship between natural processes and human activity.

Hargroves and Smith (2005) have sorted the common sustainability principles from the work and publications by different authorities as the following:

- dealing cautiously with risk, uncertainty and irreversibility;
- ensuring appropriate valuation, appreciation and restoration of nature;
- integration of environmental, social and economic goals in policies and activities;
- equal opportunity and community participation;
- conservation of biodiversity and ecological integrity;
- ensuring inter-generational equity;
- recognizing the global dimension;

- a commitment to best practice;
- no net loss of human or natural capital;
- the principle of continuous improvement; and
- need for good governance.

Projecting these principles to open and distance learning system outline the sustainability issues to be taken into consideration while planning, implementing, evaluating and using this system.

Principles and Guidelines for Distance Learning

There is no doubt that 'one size fits all' is not valid for open and distance learning. Case studies present many findings and discussions for best practice, theories provide guidelines and explanations but each project remains unique regarding its content, participants and objectives. As Anderson (2008) states, "distance learning will be increasingly diverse in response to different learning cultures, styles, and motivations". Participants with diverse backgrounds, various expectations and different teaching/learning styles either individually or within communities are attracted by the benefits of distance learning presented by the 'any time and any place' motto.

Research aiming to create effective learning highlights important issues to be taken into consideration throughout the design of open and distance learning environments. Bransford, Brown and Cocking (1999), mention that community, knowledge, learner, and assessment centered methods would lead to effective learning experiences. Anderson (2008) recommends the term 'learning-centered' rather than 'learner-centered', explaining that "A learning centered context must meet the needs of the teacher, institution, and the larger society that provides support for the student...as well as for the particular needs of individual learners".

Wilson (1997) states that the distance learners seek for a sense of belonging and need to trust the process they are in and have diverse expectations when learning is concerned. The institution cannot remain regardless to these demands and has to contribute. This leads to a change in the institutional and organizational structure of education as Howell (2003) underlines, giving administrators the responsibility of resolving concerns, ensuring adequate support, and developing the necessary course management systems and teaching strategies.

As in sustainability, there are principles and guidelines for distance learning resulting from extensive research and practice. These principles are given in the following section and are further tabulated with principles of sustainability to highlight areas of intersection.

Pedagogical imperatives are introduced by several bodies, focusing on instructional

design and satisfaction issues. The Sloan Consortium (Sloan-C) introduced “The Elements of Quality Online Education”, naming the elements as; learning effectiveness, cost effectiveness, access, faculty satisfaction and student satisfaction. Best Practices for Electronically Offered Degree and Certificate Programs published by The Higher Learning Commission (HLC) are divided into five separate components such as:

- Institutional Context and Commitment; covering the consistency of the program with the institution’s role and mission, requiring its commitment in case of budget and policy.
- Curriculum and Instruction; focusing on learning outcomes rather than modes of delivery and providing staff with appropriate academic qualifications
- Faculty Support; by providing ongoing program of appropriate technical, design, and production support for participating faculty members
- Student Support: providing equality among on campus students and building online communities is emphasized
- Evaluation and Assessment: highlighting the importance of documented assessment of student achievement to be conducted in each course, firm student identification, protection of security of personal information and determining overall program effectiveness together with the institution’s ongoing self-evaluation process.

The American Distance Education Consortium addresses the key principles for distance learning as follows:

- ‘Design for active and effective learning’, stating that the design process should consider context, learner needs, goals, characteristics and the local learning environment.
- ‘Support the needs of learners’, stating that both technical support and library and information services together with problem-solving assistance in all fields including use of technologies for learning must be provided.
- ‘Develop and maintain the technological and human infrastructure’, stating that the distance learning provider has both a technology plan and a human infrastructure to ensure that appropriate technical requirements are established and learners and learning facilitators are supported in their use of these technologies.
- ‘Sustain administrative and organizational commitment’ stating that distance education initiatives are integrated into the mission, budget, marketing and human resources bodies of the organization.

Referring back to Kim (1998), for “... providing the best of all possible worlds for people and the environment both now and into the indefinite future” sustainability

Table 1: Principles of sustainability combined with the standards and pedagogical principles of distance learning

Principles of Sustainability			
Attention to the Planet	Social & cultural needs - Human well being	Continuous improvement	Good governance
Instructor/Student	Recognizing the global dimension	Sharing knowledge between all parties	No net loss of human or natural capital
Institution	Different teaching and learning cultures, styles, and motivations		Firm student identification, protection of security of personal information
Content/Design	Integration of environmental goals in policies and activities	A commitment to best practice	Dealing cautiously with risk, uncertainty and irreversibility
Technology	Institutional Context and Commitment in case of budget and policy	Determining overall program effectiveness together with the institution's ongoing self-evaluation process	Having a technology plan and a human infrastructure to ensure establishment of appropriate technical requests
	Allowing interaction with and dependence on the natural world	Awareness of consequences of design decisions upon human well-being	Accepting responsibility for the consequences of design decisions
	Community, knowledge, learner, and assessment centered methods	Focusing on learning outcomes rather than modes of delivery	
	Setting standards that are within the bounds of the ecologically possible	Treating nature as a model and mentor, creating safe objects to long-term value	Avoiding requirements for maintenance or alert administration of potential danger
	Learning Management Systems, Sharable content objects		

principles are combined with the standards and pedagogical guidance of distance learning in Table 1 with their intersecting comments. Intersections are further discussed in order to point out areas of research.

Sustainability Provisions for Open and Distance Learning

Analyzing the intersections of principles of sustainability with the standards and pedagogical principles of distance learning in Table 1, it can be stated that open and distance learning systems have adopted some sustainability principles, some are underestimated, or, so to say, need a deeper concern and some are left aside. Principles of sustainability find reflections in the standards and pedagogical principles of distance learning in the following areas;

- Recognizing the global dimension
- Allowing interaction with and dependence on the natural world
- Setting standards that are within the bounds of the ecologically possible
- Equal opportunity and community participation
- A commitment to best practice
- Awareness of consequences of design decisions upon human well-being
- Dealing cautiously with risk, uncertainty and irreversibility

The principles which need deeper understanding and concern are as follows:

- Integration of environmental goals in policies and activities
- No net loss of human or natural capital
- Understanding the local environment and increasing productive potential

Finally, the sustainability principles which do not have robust reflections in distance learning can be listed follows:

- Integration of social and economic goals in policies and activities
- Respecting relationships between spirit and matter by considering all aspects of human settlement
- Sharing knowledge between all parties to maintain continuous development
- Institutions accepting responsibility for the consequences of design decisions
- Avoiding requirements for maintenance or alert administration of potential danger
- Treating nature as a model and mentor, creating safe objects to long-term value.

As mentioned earlier in this paper, open and distance learning is a system with its own unique environment. This environment has its own unique inhabitants, tools,

life and production cycles. This environment was designed by human beings and the ultimate goal was stated as to deliver education to students who are not physically “on site” in a traditional classroom or campus by allowing self-determined, independent and interest-guided learning. In order to realise a continuous system in space or time, interruptions or disconnections must be hindered. The system has to be sustained for an indefinite period without damaging its own environment, without depleting resources and has to be renewable. Thus, among the principles listed above, the ones which need deeper understanding and concern, together with the sustainability principles which have not yet found robust reflections in distance learning are important.

Contemporary sustainability approaches pay attention to natural resources and changing values toward less consumptive lifestyles, together with cultural resources and technology. Culture, society and human well being are addressed, focusing on knowledge sharing, global dimension recognition together with a commitment to local and/or cultural best practice. Each and every participant; learners, instructors, institutions and suppliers should be able to reflect their own experiences equally and freely and trust that these reflections are taken into consideration. Carrying mutual responsibilities and constructing a common set of principles for diverse learning expectations is important in achieving satisfactory results. Moreover, the institutional commitment on providing both staff and students with appropriate intellectual qualifications, formation of secure and objective evaluation and assessment procedures and an ongoing self-evaluation process within the institution is remarkably important.

Institutions must consider integrating environmental goals in policies and activities in their distance education implementations, not content wise but in the way of thinking and performance. Institutions seem to have understood the global power of distance education, but ‘one size fits all’ is not valid for this environment; on the contrary, it is worth understanding the local environment of both the learners and facilitators, conducting on site projects with them aiming to increase their productive potential.

Science and technology certainly are important for healthy, safe and sound practices, yet have to be combined with experiences tested over time. With the expansion of technology usage and increasing demand for ‘any time any place’ education format, prior experiences certainly would nourish the progress but the experiences gained from traditional learning processes should not be left aside. Open and distance learning neither should aim to replace traditional settings, nor would remain as a digitalized version of them. Local production methods, needs, best practices and experiences can provide valuable input. In cases where cultural backgrounds of participants do not vary remarkably, concentrating on local and cultural issues and remodeling traditional practices may help avoiding unforeseeable risks. In cases where diverse cultural backgrounds are remarkably high, benefiting from various local

experiences and culture may even bring a colorful approach to the learning process.

In sustainable distance learning environments, the availability of technology and its products for all participants must be assured and also future trends for the upcoming generations must be envisioned. This can be maintained by structuring reusable learning objects, planning for affordable and sustainable technology products and through effective waste control. If ecological balances are not respected, there is the risk for future generations to encounter a polluted and unstable environment which is no longer a system but chaos. Treating nature as a model and mentor and creating safe objects for long-term value would certainly avoid requirements for maintenance or alert administration of potential danger. By this way, not only the contemporary environment would be kept safe, but provisions for permanence of the future generations would also be highlighted.

CONCLUSION

Every environment we live in has to be sustained; open and distance learning environments are no exception. The open and distance learning environments are designed virtual environments for real users. Sustaining their presence is vital for today's learner. Not to burden future generations with requirements for maintenance or vigilant administration of potential danger due to the careless creations of products, processes, or standards is, on the other hand, more important. Steps towards sustainable open and distance learning environments should be taken having this threat in mind.

REFERENCES

- Anderson, T. (2008). *The Theory and Practice of Online Learning*. Edmonton, AB: Athabasca University Press.
- Bransford, J., Brown, A., & Cocking, R. (1999). *How people learn: Brain, mind experience and school*. Washington, DC: National Research Council.
- Hargroves, K.C. & Smith, M.H. (Eds.) (2005) *The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century*. London: Earthscan.
- Kanendran, T. A., Savarimuthu, J & Durga Kumar, B.V. (2005). Issues in e-learning standards. *Sunway Academic Journal* 2, 55-65.
- Kim J. and Rigdon B. (1998) *Introduction to Sustainable Design*. National Pollution Prevention Center for Higher Education, Ann Arbor.
- McDonough, W. (2000) *Hannover Principles: Design for Sustainability*. Retrieved August 25, 2010
from http://www.mcdonough.com/writings/from_principles.htm
- The American Distance Education Consortium, (2002). *Guiding Principles for Distance Learning*. Retrieved from http://www.adec.edu/admin/papers/distance-learning_principles.html on August 2010.
- The Brundtland Commission. (1987). *Our Common Future, Report of the World Commission on Environment and Development*. United Nations,. Published as Annex to General Assembly document A/42/427
- The Higher Learning Commission (HLC). (2007) *Best Practices For Electronically Offered Degree and Certificate Programs*.
Retrieved from http://www.ncahlc.org/download/Best_Pract_DEd.pdf on August 2010.
- The Sloan Consortium (Sloan-C). (2002). *Elements of Quality Online Education: Practice and Direction*.
Retrieved from <http://www.sloanconsortium.org/node/1090> on August 2010.
- Wilson, B. (1997). Thoughts on theory in educational technology. *Educational Tech-*