

Dynamic Web-based Learning: Co-Creating Development Solutions Across Geographies

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Abstract: The field of distance learning has existed for decades, and with the growth of the internet, new models of web-based distance learning can enable professionals across geographies to learn from one another and increase north-south and south-south idea exchange. Currently, web-based distance learning still requires further methodological theorization, both in terms of pedagogy and evaluation; in practice through, there are very few examples of high-quality online learning platforms that leverage the full social capacity of the internet for training international development professionals to use as case studies. This paper will use TechChange's online learning platform as a case study of interactive, social online learning targeted at the tech for development professional community. TechChange, a Washington, D.C.-based technology and development consulting group, designed a social, interactive online platform to provide training about relevant emerging technologies for professionals working in development, disaster response and governance. Drawing on theories of social learning and social network development, TechChange focused on making the training platform socially oriented and interactive, assuming that students would learn as much from each other as from the facilitators. To monitor and evaluate this assumption, the team took a two-fold approach; they created an internal system for assessing participation, called "Techpoints" to monitor ongoing participation, and provided students with a post-class qualitative survey to better understand whether the social model of learning was perceived as useful among participants. This paper will analyze the methodology and results of their monitoring and evaluation procedures to better understand the pros and cons of social online learning. We will explore three of their assumptions. The first is that online learning is a viable alternative to face-to-face training at a systemic level, which we will analyze using a basic cost comparison analysis of doing a comparable training in a classroom given TechChange's participants' geographic distribution. The second assumption is that through social exchange, North-South and South-South idea-exchange occurred; we will do

this by correlating Techpoints and the actual content participants contributed on the learning platform. The third assumption, that social learning is perceived by participants as valuable for exchanging ideas and learning, will be evaluated qualitatively by reviewing 30 randomized student evaluations of the courses. At each stage, we will provide critique of the monitoring and evaluation methods employed by TechChange, with the aim of exploring where they can improve their tools to enhance positive data-collection. Through a critical analysis of cost relative to geographic reach, the user-generated content within the TechChange's courses, and the evaluations of those courses, this paper aims to support the development of pedagogically sound, methodologically rigorous web-based training, which could have a significant impact on trans-geographic knowledge sharing in pursuit of reducing poverty and supporting development.

Introduction: Dynamic Web-Based Learning, Knowledge Co-Creation, and Development

In a world where internet and computing capacity is making information exchange easier and faster, online social learning can provide a technological answer to promoting innovative solutions to alleviating poverty and promoting sustainable development. Since the internet makes geography less of a factor, socially oriented distance learning can promote a North-South and South-South innovation process. With the increasing ubiquity of the Internet and web-based learning systems, university and capacity-building training is increasingly being moved into the online space. Companies like Blackboard and Moodle have been developing learning management systems (LMS) for universities and corporate training applications since the late-1990s, although these are more functional as spaces for organizing information, documents, and managing logistics like grades and course lists.

As LMS platforms have emerged to provide online logistic space for educators, social networking tools such as Skype and Facebook have become global platforms for connecting people based on friendship, interest, and professional background. Facebook in particular has become a powerful space not only for socializing but also be large scale political organizing and social movements. Tools that draw on the reach and cost-effectiveness of online learning blended with the highly interactive social ecologies of social networking tools could provide a high impact space for professionals to learn about emerging technological applications for development and poverty alleviation, while co-creating knowledge of best practices. Up to this

point there are few case studies of how to create this blended space specifically to train development professionals, and limited analysis of whether such a space would create an effective learning and information sharing space for professionals from multiple countries, cultures and linguistic backgrounds.

This paper will use TechChange Incorporated's custom-built dynamic online learning platform as a case study of what a social learning space focused on technology and innovation for development and poverty alleviation could look like. This analysis will add to the literature and theory of social learning and technical innovation in development, as well as the impact of web-enabled learning on South-South and North-South information sharing. We will start with a brief overview of the history of distance education, and what effects the Internet has had on the distance learning arena. From this we will look at the impact of social media networks on information sharing, particularly social meaning making within and between different communities of practice. Moving from these two sections we will look at how TechChange developed a socially-oriented online learning space, drawing on the literature of social online learning.

We will examine the assumption that TechChange's social online learning platform adds value to development innovation, promotes North-South and South-South information exchange, and that social learning is perceived as valuable to the development professionals who participated in the trainings. To test these assumptions we will analyze the impact of TechChange's online learning platform in three stages. The first stage will be a cost analysis to assess the comparative value-added of TechChange's learning platform based on geographic distribution of participants, testing against the cost of doing the same training in person. For the second stage we will examine participant interactions in the "forum" sections of the website, where much of the social interaction takes place; the goal will be to analyze the percentage of interactions between participants that would be coded as "north-south" and "south-south", while taking account of the duration of those interactions; we will be looking for a correlation between these interactions and the number of "TechPoints" the participant earned. A final test will be to analyze TechChange's course evaluations to determine how many students cite the social element of the course as an important factor to their experience. This section will close with a critique of TechChange's

evaluation procedures, and recommendations for what could be done to improve data collection of impact based on the social aspects of learning, and the relationship between social learning and knowledge co-creation in the international development sector.

Distance Learning: A Brief Overview

Before discussing modern, web-based distance learning, we will briefly discuss the history of distance education. Distance education has been with us for centuries, starting out as correspondence courses in the mid-1700s, with universities setting up programs in the mid-1800s (Holmberg 2005). Universities in London began teaching distance courses in 1858, and universities in the United States and Australia began teaching distance courses in the late 1800s and early 1900s (ibid). In its modern iteration distance education was pioneered at the University of Wisconsin - Madison in 1964 using Charles Wedemeyer's model of distance learning, called the Articulated Instructional Media Project (AIM) that relied not only on written correspondence, but also integrated radio broadcast into distance learning. In 1969 the Open University in Great Britain used the AIM model to incorporate radio and television technology into distance learning; Canada set up an open university in 1970, followed by Germany in 1974. Both used a model that was independently developed, but drew on the lessons from the AIM model (Moore and Kearsley 2005).

With the growth of the Internet and increasing accessibility of smart phones, distance learning has expanded significantly. From an American perspective, Oblinger outlines the value that distance education adds to the learning space (2000). These include the expansion of access to students in remote locations, removal capacity constraints such as classroom space, and catalyzing institutional transformation in an increasingly technological environment (ibid). These perspectives are supported by the findings of Radford and Weko, who found that from 2000 to 2008 the number of American undergraduates enrolled in at least one online distance course increased from 8% to 20% (2011). While it is apparent that online distance learning is growing, in order to analyze the role that distance learning technology can enhance international development technology innovation and North-South/South-South information sharing and knowledge expansion, we will need to move into a discussion of social networking and social learning in the online environment.

Social Learning and Social Networks

While the above examples demonstrate the growth of Internet-enabled distance learning, to move the discussion toward development innovation and information sharing/knowledge development requires that we look deeper into the role that social networking and social learning play in germinating ideas. The distance learning methods that we see in U.S. universities are still very “top-down”, which does not encourage lateral conversation and learning between students. While the learning is done online, platforms such as Blackboard and Moodle are not optimized to create a social learning environment, and without the social aspect of online distance learning we assume that information sharing and knowledge co-development is less likely to happen. In order to understand what a social learning space looks like we will discuss trends in social media and briefly review the literature and practices for making online distance learning social.

When we think of knowledge creation and information sharing for development, the goal of learning in an online environment should be to create a social space. This kind of social space can be developed around making sure that students have a developed sense of self within the learning platform, and that this sense of self is developed by interacting with others during periods of both synchronous and asynchronous learning (McInnerney and Roberts 2004, Siemens 2004). By creating a space where students form a community the facilitator prevents students becoming isolated; this can be avoided by making sure that there are synchronous activities that all participants engage in at the same time, a warm up stage where students can explore the learning platform and become comfortable with the software, and guidelines for regular, predictable communication between students and the facilitators (ibid). With tools such as chat functions, streaming video, and voice over IP (e.g. Skype), building an online learning environment that encourages socialization and community building is relatively easy. The challenge is understanding how development professionals will use this space to share information and co-create knowledge, and then tailoring an online learning environment to encourage social learning and community development.

To expand into the question of how to create a social community experience around an online training platform, we have to look at two aspects of online learning; student attrition, and what

leads to a sense of community. Attrition rates for online courses can run up to 20% higher than those in traditional classroom settings (Angelino and Natvig 2009). To address this we can look initially at Lamport and Bartolo's study of student perceptions of what makes online learning social and community enhancing (2012). Students cited asynchronous aspects such as space for personal introductions, discussion boards and teacher feedback as the most important factors in feeling like they were in a community (ibid). Synchronous learning can be catalytic in developing relationships between participants and encouraging information and idea sharing in a communal environment (Haythornthwaite 2001). While asynchronous aspects of learning were cited by Lamport and Bartolo, the challenge faced when working with development professionals is that face-to-face synchronous learning is not necessarily practical given the geographic distribution of participants. To remedy this challenge online learning platforms can integrate tools like direct chat windows, chat "rooms" for multiple participants, and live video streaming between participants and guest speakers.

Since our analytic goal is to understand whether online social learning enhances knowledge co-creation, information sharing and trans-geographic innovation, we will need to take a step beyond analyzing online learning and explore the development of professional social networks in the digital space. Since learners are coming from a variety cultural, geographic and organizational backgrounds, developing an online learning platform that provides a variety of learners with a "big picture" of the topic will allow them to determine where they fit into the social ecology of the learning environment in terms of their skills and knowledge (Morrison 2002). Once participants have found the space where their talent or skill set fits into the larger course, they can actively engage with other participants who have different skills sets to collaboratively find solutions to complex problems (Cross et al 2002). Expanding this to the level of analyzing the impact of social networks in creativity, we can look to Perry-Smith and Shalley's explanation of how creative solutions are developed in a social network (2003). Actors come into a social network as new members, bringing with them strong bonds to their other networks but loose connections to their new network; as they feed their ideas into their new network those ideas mix with the ideas of their new counterparts in the network forming new, creative ideas (ibid). As these ideas are refined and enhanced in the social network, the actors

develop stronger social bonds with each other leading to the production of robust, creative problem solving strategies (ibid).

What we see from the integration of distance learning and social network theory is a space where an online distance learning platform that is optimized for social networking could be a catalyst for enhancing information sharing, knowledge co-creation and learning across north-south and south-south organizations and actors. The problem we look to explore is what this kind of social learning space looks like in practice. Many organizations including the U.S. Institute of Peace, the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), and the Foreign Service Institute use online learning platforms such as Blackboard and Moodle but these platforms are not optimized for social interaction. They act more as content management systems, where materials are stored and intra-class communication can be managed. They are also vertically integrated, where the pedagogical model relies on having an instructor be the leader and provide the knowledge to the students, as opposed to encouraging the students to learn from one another as much as the instructor. The model that Blackboard and Moodle are built on is unlikely to be optimal to produce co-created knowledge or innovative changes to the already accepted models of poverty reduction and development. What we will look at is a case study of what a social, laterally integrated learning space looks like, and analyze whether it actually creates a space where idea co-creation and innovation happen.

The TechChange Social Learning Platform

The case study we will explore as an example of online social learning spurring idea co-creation and innovation in the development space is TechChange Incorporated's web-based social learning platform. TechChange, a social-responsibility oriented consulting firm in Washington, D.C. "...trains leaders leverage relevant technologies for sustainable social change." The company focuses on technology training in the development and conflict management, and peace building spaces, with clients including United Nations staff, professional staff members from a variety of governments, leaders from the NGO space, and academic practitioners. TechChange's content is applicable to the challenge of poverty alleviation since they are training professionals working in fields such as public health, economic development and conflict management; these sectors all play critical roles in the mitigation of poverty. While TechChange has capacity to

facilitate in-person trainings and provide analytic consulting services, their core product is a custom-built online learning platform. Their goal is to make distance learning as close in nature to classroom training as possible, by making it social and encouraging lateral interaction between the students moderated by content experts.

Their online learning platform is built on the WordPress architecture, but has been highly customized and integrates a variety of social tools including translation features, embedded video conferencing, a chat tool, and a space for hosting group chats. The course also features discussion forums for all the materials, spaces for live presentations from experts, and opportunities to participate in live question and answer sessions with those experts. The space is designed around the theories of social learning and social networking, based on the assumption that by bringing professionals together from across different professional networks and allowing them to develop their initially loose social bonds into strong bonds will lead to innovative solutions to development challenges (Perry-Smith and Shalley 2003).

The structure of the training platform that TechChange built starts with the learner as the primary actor. There is a space to build a detailed personal profile and attach a photo; the goal is to make the profile as “live” as possible so that people see one another when they interact across the site. The next level of the architecture is moderated learning groups. Course participants choose groups to join based on interest; in the TechChange course focusing on emergency management students can join groups that focus on social media, logistics, mapping, and mobile telephony, among others. From groups, we move up to the materials level, where a set of foundational materials frame the scope of the course for all the participants. There is a discussion space for all these materials where participants can analyze and co-create knowledge around the reading and multi-media materials. While these discussions happen asynchronously, there are also scheduled live events such as simulations and expert video chats where all participants come together to cooperatively solve a problem or interact with the guest expert. When the course is completed, all participants are then invited to join an alumni group where they are encouraged to stay in contact with one another; they are also given access to the course site for three months after the completion of the course to revisit materials, videos and discussions.

This site structure meets the theoretical framework discussed earlier for social learning across different professional and geographic networks. Participants enter the course with loose social bonds, and come from professional environments where they have strong social bonds. They are given an open structure in the materials section to find the place that their knowledge fits within the social learning environment. Participating in the discussions around the materials allows participants to create stronger social bonds, and as they get to know each other the secondary communication tools like video chats allow them to deepen their relationships. By then joining moderated groups focusing on particular topics, where we expect them to move toward the center of a social ecology where they co-create knowledge and innovative solutions to challenges they face in their professional work in the field of development. The challenge is assessing whether the platform, which covers the theoretical bases of online social learning, does so in practice. Since September 2011 TechChange has managed 7 trainings on their platform for over 200 participants from around the world, including two custom courses for participants in Sudan and Pakistan. We will use data collected by TechChange to assess the impact of their courses and test whether their platform is appropriate technology for the co-creation of knowledge and innovation across north-south and south-south professional circles.

Does Social Learning Lead to Knowledge Co-Creation?

While the technology that TechChange uses for its distance learning platform covers the theoretical aspects of social network learning in theory, our goal is to evaluate how practical the platform is and whether it produces the expected benefits of north-south and south-south information sharing and knowledge co-creation. We will look at the practical aspect of using this technology from a cost-benefit analysis. This will be a very basic analysis comparing the cost of re-creating the TechChange learning environment in Washington, D.C. for the same distribution of participants. This helps us understand whether this is appropriate technology for the development community to adopt in pursuit of developing sustainable solutions to enhancing development and alleviating poverty. The second level of evaluation is whether or not course participation, measured using “TechPoints”, correlates with north-south and south-south interaction. TechPoints are an automatic numeric indicator assigned to participants; they earn them by adding comments, participating in live chats and posting the course blog. TechChange moderators use these to track participation and respond to participant needs; we aim to

understand whether these points also indicate the likelihood of co-learning across geographies. The third evaluation will focus on the participant evaluations. Do participants share the same assumption about co-learning and knowledge development? We will do an analysis of thirty random course evaluations to see whether or not students cited inter-activity, social factors or networking as critical to their learning. To close the section we will look at two brief case studies of participants co-creating social learning groups locally once the online training was complete, as well as provide critique of the evaluation methods employed by TechChange.

Evaluation of Impact: Cost, Correlation and Perception

Our first level of evaluation is related to cost-effectiveness. In the process of developing a tool for capacity building and training that can help development organizations innovatively solve the problems related to poverty, the tool (in this case an online learning platform) must be financially accessible to actors from both the North and South. We will use a sample of students from the TechChange course on social organizing as our test group to build a cost comparison. We are interested in the diversity of geographic locations they represent, since logistics is what will add the most in terms of cost. Since even the best online learning platform cannot replace face to face social interaction, we expect that the cost of running a social, dynamic online training should allow for multiple iterations of trainings. First we will break down the geographic distribution of the participants from the TechChange course entitled “Global Innovations for Digital Organizing”:

Table 1.1 Participant Geographic Distribution, “Global Innovations for Digital Organizing”

N. America	Europe	Africa	MENA	Asia	Caribbean / Latin America
17	9	5	4	5	6

Given this break down, TechChange was able to run this particular three week training course for the entire group at a cost of USD \$17,775.00. To gauge cost-effectiveness we expect that a course of this length and geographic distribution should be able to be run four times for the cost of running it once in Washington, D.C. for one intensive week. Below is a table of comparative costs for a one-week intensive course with the same group of students; this includes estimates of airfare (for non-North American participants, based on an aggregation of results from kayak.com

using nearest international airport to participant’s residence), hotel (five nights for fifty people at approximately USD \$200.00 per night), and the cost of the course itself. It does not include meals, sundries and transportation which are too varied by participant to estimate:

Table 1.2 Comparative Costs, One Week In-Person Training Versus Online Platform

Airfare	Hotel (5 nights)	Course Cost	Total	Online Iteration Equivalent
USD \$ 33,000	USD \$ 50,000	USD \$ 17,775	USD \$ 100,775	5 online courses (Total/ \$ 17,775)

What this comparison makes clear is that there is a distinct value-added to being able to do training and capacity building online, particularly when the goal the capacity building is to encourage North-South and South-South communication and idea co-generation. Indeed, 20 out of the 46 participants were from the South, so opportunities for North-South and South-South interaction were high. Since its apparent that using a social online learning platform for capacity building and knowledge co-creation is cost-effective, the next level of analysis is to explore whether or not the expected interactions are happening on the platform. Given the social orientation of the space, we expect that participants are going to share knowledge but to test this further we will look at a sample of participants who earned the most “TechPoints”, TechChange’s system for monitoring participation, and correlate the number of TechPoints with the number of direct interactions that can be coded North-South. The way we code direct interactions is to analyze the content of the course discussion boards and look for direct references to other participants; based on where the participants are from these interactions could be North-North, North-South, or South-South. Unfortunately there was a paucity of data that could be coded South-South using this method, and this will be addressed later in the paper. In the regression analysis North-South interactions were the dependent variable, and TechPoints was the independent variable, we used a sample size of 30 observations. The correlation demonstrated little explanatory power, lacking statistical significance and effectively no linear relationship.

Unfortunately this methodology does not account for all participant interaction; a participant could have provided far more commentary on the discussion board without exclusively directing their comment toward another participant. What we are attempting to measure is a very particular snapshot of how TechPoints correlate with a specifically defined participant

interaction; further analysis can be done on the value of the test and alternatives for exploring North-South and South-South interactions later in the paper.

The third level of analysis is the perception side among the participants. What we are most interested in is whether the participants found the social component of the training platform important to their experience. This is important since the theory of social connective learning leading to innovation hinges on the assumption that people will connect socially. If there is a lack of perception that socialization was important when using the platform this could point to something as mundane as the space being so seamless that the social aspect of the platform is not mentioned due to its own self-evidence, or possibly a survey methodology problem within TechChange’s course evaluations. The analysis below is based on a review of 30 randomly selected post-course surveys and codes the results as either yes or no regarding socialization being an important part of the course.

Table 2.1 Comments on Social Importance in the Platform

N (number of surveys)	Yes	No	Percent Yes
30	18	12	60 %

What is interesting about this data is that the positive responses break down into three general themes. These could be described as co-learning, idea fusion, and professional networking. In the co-learning theme, students noted that they were learning about new technical tools, development approaches and institutional capacities from each other. The second theme, idea fusion, was when students described working with someone from a different geographic or institutional background to create a new approach to or understanding of a development question or challenge. In the survey data there were a number of students who wanted more social interaction. The third theme focused on the networking aspect of the platform, where practitioners met one another and then took their professional relationships off-line after the course. In some cases these off-line relationships led to the kind of North-South and South-South information sharing that we are seeking to identify; we will look at two of these cases both to better understand how these relationships emerged while addressing the statistical problems we saw in the statistical analysis of TechPoints and participant interactions.

Analysis and Lessons Learned

The most obvious question we started with was whether this was appropriate technology given the goal of promoting North-South and South-South information exchange and innovation, particularly when looking at the financial sustainability aspect. In this regard, while the TechChange social learning website is not a replacement for face to face training, it is a cost-effective alternative for creating a social learning space for people from a variety of geographic locations. The sample of the survey data from the third analysis also confirms that the social component of the site is important and was successfully implemented. Cross et al provide a method for surveying student relationships within an online social learning environment that could prove useful when evaluating the TechChange platform (2002). Where we need to do some deeper analysis is in regard to the second statistical test; while this provided little explanatory power for whether North-South and South-South interactions and information sharing took place, there are two cases of students in Haiti and Ghana developing bonds using the TechChange learning space and then taking these interactions beyond the platform to create communities of practice in-country. These provide non-statistical examples of South-South innovation that comes as a result of the TechChange learning platform.

The first example of online social learning leading to sustainable North-South and South-South innovation is a group of professionals working in Haiti who all took the TechChange course “Mobiles for International Development” in November 2011. These individuals were all working in Haiti, but did not know each other until they met virtually in the TechChange course (Marentette 2011a). As they interacted virtually, they started sharing ideas and information that was valuable to their work in Haiti; when the course ended they stayed in touch and formed a group that continued to focus on innovative uses of mobile technology for development and poverty alleviation in Haiti (Marentette 2011b). The group benefits from local knowledge and information sharing across organizations. This group is a tangible example of how a social learning space can provide a cost-effective space for people to meet, share information and develop relationships that will lead to further collaboration and innovation in the field.

The second example of the social learning platform leading to idea co-generation between South-South actors also came from the “Mobiles for International Development” course in November 2011. A group of five participants from Ghana all independently joined the course, and were highly active in the discussion sections, participated in the group chats and live video streams, and met through the platform. They developed relationships through the platform that carried over into their work offline after the course. This is another demonstration of how online social learning can enhance and support South-South information sharing and idea co-generation.

While these examples do not constitute a sample in any predictive fashion, they do demonstrate that social learning on an online platform can lead to the development of the kinds of social networks that spur innovation in development practices. By bringing together practitioners from different professional and geographic backgrounds the opportunities for finding unique synergies between the sectors of development practice and poverty alleviation increases. Knowing this, it is also important to provide critique and recommendations for the monitoring and evaluation of particular interactions on the TechChange platform. As we saw in the second analysis, there was little statistical relationship between participation and easily recognized interaction between professionals from North-South and South-South backgrounds. TechChange modified the platform since the start of this paper to include a tagging system when participants commented or added content to the site; when someone adds a comment it is stored in their “activity” section for others to look at. Participants can also direct their comments or questions to directly to each other by adding an “@” character in front of another participant’s name. When this happens the name becomes a hyperlink and can be clicked on and searched in a similar way to hash tagging on Twitter. When they do this the participant is alerted that they have had a comment directed to them, and the course instructors can also search conversations by clicking on the hyperlinked name. This makes it easier to see who is talking with whom, and allows participants to form connections around topics more efficiently. From an evaluation perspective, this also makes organizing participant-added content after the course easier when trying to analyze how people were interacting. This modification deserves to be revisited once there have been further iterations of TechChange trainings to see if “@” marking makes it easier to statistically relate participation and North-South/South-South interactions. Raffay and Chanier provide a more in-

depth network analysis methodology that could be used to more effectively analyze this kind of interaction data (2002).

Conclusion

While the case study of the TechChange online learning platform only covers a time span of six months, we already see that social online learning can have a positive effect on information sharing, idea co-generation and innovative solutions to poverty alleviation and development. As internet and mobile telephonic access expands globally, this kind of internet-enhanced learning could provide cost-effective, open spaces where practitioners can build connections across geographies and operational sectors that can lead to innovative new approaches to poverty alleviation and sustainable development.

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