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Designing capacity-building in e-learning expertise: Challenges and strategies

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Designing capacity-building in e-learning expertise: challenges and strategies

Abstract

This research study looks at how organizations in developing countries perceive the challenge of building capacity in e-learning expertise. Data was collected on six such organizations, and a range of perceived rationales and constraints were identified. The paper hypothesizes a four-part framework to define the e-learning capacity gaps that these circumstances appear to represent: the "instructional design capacity gap", the "production capacity gap", the "tutorial capacity gap" and the "community building gap". The framework is used to re-examine the data to explore the ways in which the organizations' e-learning activities might constitute strategic responses to the hypothesized capacity gaps.

Keywords: ICT for development; distance education and telelearning; learning communities; pedagogical issues; adult learning; distributed learning

1. Introduction

Much has been written about introducing and improving e-learning in established organizations (e.g. Laurillard, 2002; Salmon, 2002; DeRouin, Fritzsche & Salas, 2005), some of which literature has addressed particular issues facing developing countries (e.g. Carr-Chellman, 2005; Van Der Merwe & Mouton, 2005). However, while there are numerous descriptive accounts of e-learning initiatives that aim for the development of e-learning expertise as a by-product, little research has been conducted into the conceptualization of the efforts of organizations engaged in the more specific challenge of building capacity in e-learning expertise. This paper describes some empirical and theoretical research in this area.

After introducing the background to this study, the paper outlines the methods used to collect data on perceptions by six non-governmental organizations (NGOs) of the nature of the challenge of building capacity in e-learning expertise. So, why are the NGOs motivated to facilitate and extend the use of e-learning by those in their respective countries of operation? What are the kinds of barriers and difficulties they face in attempting to do so? A range of perceived rationales and constraints are identified. The paper then attempts a tentative conceptualization of the nature of the capacity gaps that such circumstances appear to represent. A four-part framework to define the capacity gaps is offered. Following this, the data is re-examined to explore the ways in which the e-learning activities of the organizations might constitute strategic responses to the hypothesized capacity gaps. The paper concludes with suggestions for further research to test the hypothesized challenges and strategies.

2. Background

The key drivers towards online learning are becoming well understood. In established educational markets, increasing commercialization leads to fears of being overtaken by competitors, particularly with respect to enrolment, efficiency, and effectiveness (Oliver, 1999; World Bank, 2002; Clegg et al., 2003; Mason, 2003; WebCT, 2005). In relation to enrolment, Information and Communication Technologies (ICTs) are often claimed to be able to extend markets beyond traditional geographical boundaries (Middlehurst, 2003), widen participation through greater access and flexibility for learners (Breen et al., 2001), increase revenue from lifelong learning, widen the curriculum, and minimize the risk of being seen as behind the times. In relation to efficiency, the promise of lower costs – particularly those associated with buildings, travel, salaries, resource management, and the development of learning materials – has been "one of the most frequently cited advantages of e-learning in tertiary education and beyond" (OECD, 2005). Finally, in relation to effectiveness, there are expectations that ICTs open up possibilities for more active and social pedagogies (Mason, 2003), access to more resources, a wider diversity of cultures, greater flexibility in learning and thus enhanced engagement, the refinement of teaching materials through communities of educators and trainers, more scope for formative assessment, and various forms of online communication including peer-to-peer interactions.

To what extent it would be advisable for NGOs in developing countries to accept the rationales implicit in these drivers is a moot point. While there is no doubt that the potential of interactive software, electronic resources, and internet-based communication tools should be considered carefully in planning specific training and education initiatives (Peake et al., 2005), there are arguments on both sides in relation to enrolment (Middlehurst, 2003; Lewin, 2000); efficiency (World Bank, 2002; Grace & Kenny, 2003), and effectiveness (Mason, 2003; McGrath & King, 2004).

Moreover, as is well known, geographical, financial, technical, and other practical considerations can be problematic in relation to telecommunications and computer hardware in some developing countries (Human Development Report, 2001; bridges.org, 2003). Internet access in wealthier countries can be between 10 and 30 times higher than in poorer countries (ITU, 2003); and in most countries, Internet users are predominantly urban (Human Development Report, 2001).

Nevertheless, the International Telecommunications Union recently created a website of e-learning success stories in a range of such countries, and stated that "Despite the many hurdles facing developing countries as they strive to modernize their educational systems… ICTs can be an effective vehicle for bridging educational divides and the wider global digital gap." (ITU, 2006).

The range of e-learning initiatives shows that the choice is rarely a simple dichotomy between online learning and face-to-face learning: there is a diversity of models that could be adopted, in which online learning, computer-based learning and learning using mobile devices can be blended in various ways with face-to-face teaching, printed texts, radio, and television.

The United Nations Development Programme has defined capacity as "the ability of individuals, organisations and societies to perform functions, solve problems, and set and achieve goals." (UNDP, 1994). Capacity building in e-learning was given official sanction by the 2005 World Summit on the Information Society, which gave strong encouragement to properly-resourced "national strategies for ICT integration in education" (WSIS, 2005).

In considering what is meant by capacity building in this paper, a distinction needs to be drawn between (i) education in how to use ICT in basic ways; (ii) improving physical access to educational technologies, through initiatives such as "One Laptop per Child" (Twist, 2005a), Nokia's use of mobiles to deliver education materials (Twist, 2005b), or the examples of internet connectivity described by the ITU (2006); and (iii) helping those involved in education to make best use of ICT *for* education (Larson, 2004; Bawa, 2004). It is this latter "e-learning expertise" that is the concern of this paper.

There are numerous accounts of how to foster the development of this expertise in organizations (e.g. Creanor & Littlejohn, 2000; Laurillard, 2002; DeRouin, Fritzsche & Salas, 2005); attempts to help educators and trainers understand e-learning choices in terms of pedagogical theories (e.g. Weller, 2002; Conole et al., 2004); reports of challenges faced by educators and trainers (e.g. Weaver, 2004; Van Der Merwe & Mouton, 2005); knowledge-sharing initiatives (McAndrew et al., 2004); and checklists, case studies, and sets of principles (Salmon, 2002; Carr-Chellman, 2005; elearningeurope.info, 2006). However, while an extraordinarily wide range of e-learning programs are rapidly becoming available from public and private organizations across the world, the factors that determine educational effectiveness are, as yet, not well understood; and it still proves difficult for organizations to learn from each other.

Moreover, McGrath & King (2004) suggest that knowledge-based development is not unproblematic. In particular, underlying rhetoric of knowledge management and learning organizations, there are typically tensions between, on the one hand, a technological approach that emphasizes the capturing and codifying of knowledge, and, on the other, a social approach that emphasizes connections between individuals engaged in sharing knowledge. McGrath & King also argue that *what* is shared, whose knowledge is shared, and what incentives are there for sharing are important questions.

The work described here complements this literature by asking the capacity-builders based in the countries concerned how they themselves perceive the challenge of building capacity in e-learning.

3. Data collection and analysis

A case study design was adopted involving six NGOs based in Africa, the Middle East and Asia. The six were chosen for opportunistic reasons: formal sampling was not feasible in view of the difficulty in identifying and gaining adequate access to suitable organizations. Moreover, it was intended to capture diversity rather than representativeness, so as to identify commonalities of experience.

All six organizations have diverse remits to strengthen the capacities of their countries of operation; and most also have a reach that incorporates several countries in their respective regions of the world. They also represent a mix of organizations – academic, commercial and developmental – in contrasting circumstances in relation to engagement in e-learning. NGO A, for example, acts as a broker of selected courses typically developed in North America; whereas NGO B, a university, has started adapting pre-existing e-learning materials and their associated assessment strategy; NGO C, built through development funds, helps universities identify academic needs and supplies them with appropriate content, delivery technology, and quality assurance systems; NGO D is a small R&D company interested in building high quality interactive tools; NGO E is a university research centre that also has a training

and education role; and NGO F is a large development organization currently fostering grassroots approaches using a "web + email" model and wanting to go further.

The focus of the data collection was on obtaining a view of each organization's perceptions not of the advantages and disadvantages of e-learning so much as of the nature of the challenge of capacity building in e-learning. This focus included the organization's perceptions of the needs in the particular context that e-learning is seen as helping to address, the opportunities to build capacity, the advantages and disadvantages of building capacity in e-learning (rather than engaging some other undertaking), and the barriers and hurdles they have anticipated and experienced.

Methods of data collection included a variable mix of questionnaires, interviews, websites, conference presentations, research literature, and other texts in the public domain. Since the aim was to gain a rich, contextual understanding of each NGO's perception of the nature of the particular e-learning challenge faced, standardized instruments would not have been appropriate at this early stage of research. However, attempts were made at consistency of methods as far as possible.

The "challenge" associated with building capacity was intended to be the collective view of the organization, although it is inevitable with these kinds of data sources might not necessarily represent the majority view of members of the organization, nor in fact the definitive "official view" either. The volunteer respondents were closely involved in their organization's e-learning efforts and it would be realistic to assume that in most cases their evidence was biased towards a pioneer's perception (that is: enthusiasm tempered by reality) rather than a sceptic's perception or a marketing director's patter. Another source of bias is the familiar one that published documents tend to under-represent the internal problems of the organization. At the same time, some of the organizations have a clear vested interest in publicizing the sometimes profound technological problems faced by their countries. The case studies are not named here, for reasons of confidentiality.

Following the data collection, a discursive description of each of the case studies was developed, drawing out key themes relating to the focus of the study. This description was then returned to respondents seeking validation and comment. These descriptions were then subject to a process of comparison with each other, to highlight commonalities and exceptions.

4. Perceptions of Challenge

4.1 Why build capacity in e-learning?

There seems to be a widespread acceptance of the view that, as Hernes (2003) puts it, "A society's wealth and welfare are decided by its capacity to train and educate its people to share in making and applying knowledge in all spheres of life." (p. 8).

The case study NGOs are typically focused on the "training of trainers", so as to "cascade" knowledge and skills efficiently, and on the use of distance learning methodologies because of the logistical and financial difficulties associated with removing educators and trainers even temporarily from their day-to-day work.

The reasons for building capacity in e-learning centre on the same reasons as for using e-learning itself. A view was commonly expressed by the NGOs that they need to build infrastructure and expertise in new educational ICTs because developed countries are investing heavily in such technologies and this suggests firstly that these countries are convinced these technologies offer the best ways to train and educate

(and these NGOs are in the business of seeking the best means of training and educating); and secondly that unless developing countries bridge the "digital divide", rich countries might obtain a competitive advantage in training and education that, in the globalized knowledge economy, will exacerbate current inequalities in health, wealth and welfare. At the same time, there is attentiveness to the possibility that what might be "best" in one country or region might not be best in another, especially if there are distinct differences in social factors relating to inclusiveness, efficiency and effectiveness, such as the telecommunications infrastructure, ICT skills, and internet access costs (Mason, 2003).

A further, more pragmatic, point is that some development agencies and philanthropic organizations stress the importance of human capacity as at least as important as physical access to technology. A key consideration for several of the case study organizations, then, is that, regardless of whether the NGOs themselves judge capacity building in e-learning as their highest priority, while e-learning and capacity building are on the international development agenda there are likely to be funds available for such work.

Nevertheless, at the same time there is clearly much internal enthusiasm for this agenda for at least some of the NGOs, in that e-learning is seen as an exciting new way of achieving improvements in education and teacher education. NGO A, for example, noted that if a topic of vital importance to a particular country or region has only small numbers of experts with high-level knowledge of the topic, e-learning has the potential to extend dramatically the geographical "reach" of those experts. Thus building capacity in e-learning makes strategic sense.

However, more than this, if e-learning is to count as a success, it needs to have certain attributes. These success criteria are phrased by the NGOs in diverse, overlapping ways, but key ones seem to be:

- *inclusivity*: e-learning is useless if it is inaccessible to a large proportion of the group of individuals targeted by the NGOs' respective capacity-building efforts;
- *convenience*: e-learning that does not fit with the lifestyles of the target group (including financial cost and workload) will be unlikely to achieve much;
- *engagement*: e-learning that fails to engage the target group in a rich educational experience is unlikely to be seen as worth the effort compared with other means of learning;
- *effectiveness*: e-learning that fails to deliver the desired outcomes for the target group will be seen as ineffective;
- *trustworthiness*: e-learning that conflicts with cultural values, that makes private information or conversations public without permission, that undermines relationships, or that appears to be overpriced will be seen negatively;
- *sustainability*: e-learning that requires too much of tutors, or that does not pay its way, or that depends on faulty social or technological assumptions will be seen as failure.

So a key part of the challenge of e-learning capacity building is for e-learning to satisfy these success criteria.

4.2 Perceptions of constraints

There appear to be a similar set of barriers and hurdles for capacity building in e-learning as for e-learning itself. All NGOs mention inadequacy of current ICT

infrastructure, the availability of equipment for users, and telecommunication costs. Several mention the lack of staff with appropriate ICT skills, and some discuss problems of motivation. According to respondents, these motivation problems seem to be more to do with not seeing the relevance or importance of ICT in day-to-day practice, or in engaging in any form of professional development, rather than objections that are sometimes made which are founded on criticisms of e-learning itself: that it is a lonely, unengaging experience made uncomfortable made by having to read a screen; that it lacks the emotional consequences that enable a progression to proficiency or experience (Dreyfus, 2001); that the evidence base for its effectiveness is weak (Beyth-Marom et al., 2003); that it might be unsuitable for those with poor study habits (Mason, 2003); or that it might be used to smuggle in a capitalist ideology under the guide of "learner-centred pedagogy" (Tabulawa, 2003). However, as mentioned previously, the respondent sample is likely to have a bias against those who might rate such arguments highly.

As mentioned above, the agendas of richer countries can sometimes act as a constraint. One respondent noted, for example, that while the glamour of the $100 laptop has attracted much media attention, the economics of the wind-up radio has not. Furthermore, while existing e-learning expertise in rich countries tends to be focused on late 20th-century text-based media, the oral traditions that are indigenous to the regions of some of the case studies have arguably greater congruence with the forthcoming mobile technologies (UNCTAD, 2003) that might enable the "leapfrogging" of the establishment of a fixed-line telecommunications infrastructure. Another example is that while the World Bank might be prepared to provide loans for a sophisticated digital video satellite transmission and receiver network in Africa (Amutabi & Oketch, 2003), NGO E noted more prosaically, and perhaps only partly in jest, that a lack of air-conditioning in its offices was a constraint on its capacity in the summer.

Several of the NGOs planned stable, user-friendly, upgradeable, 24/7 computer systems, with suitable user support. Even when such conditions are met, experience suggests that there are inevitably technical difficulties of varying degrees of severity. The experience of a few of the NGOs suggests also that it should not be assumed that learners and tutors are confident about text-based synchronous conferencing, especially in countries that do not have a history of online communication. Participants in online learning may need to upgrade their ICT skills before they start a course, to enable them to communicate effectively online.

It was also noted that although there are in principle a wide range of arts and humanities topics available, the topics chosen for e-learning in NGOs A, B and C are often related to information technology, business studies or English language study, for which online courses are readily available from developed countries. Whether e-learning extends so easily to more practical areas such as farming or HIV prevention is not clear.

4.3 Types of capacity gap

The e-learning capacity gaps expressed by the NGOs can be divided into four:
1. The "instructional design capacity gap" – how far the organizations wish to boost their capacity to design e-learning programs.
2. The "production capacity gap" – how far the organizations wish to boost their capacity to translate paper materials, scripts and ideas into e-learning materials.

3. The "tutorial capacity gap" – how far the organizations wish to boost their capacity to provide online tutoring to learners.
4. The "community building gap" – how far the organizations wish to boost their capacity to build communities using educational ICT.

For example, a clear priority for NGO F is the building of high quality interactive tools and of tailoring conventional texts to the affordances of the web. Tutorial activity and community interaction do not feature significantly. So the capacity gaps would be characterized as instructional design and production. In fact all the NGOs expressed a need to improve skills in designing e-learning, and in developing or revising materials so as to maximize effectiveness. However NGOs A, B, C and E also identified improving online tutoring as of importance. NGO D, meanwhile, was explicit about the desire to build communities that exploit the technologies and methods of e-learning (although it is arguably implicit in other organizations' aims too).

This classification is offered tentatively, and needs the further development of data collection instruments to test its robustness empirically. Nevertheless, the classification can be used to re-examine the current data to explore the ways in which capacity building activities of the organizations might constitute strategic responses to the hypothesized capacity gaps; so we now sketch out the nature of these gaps.

5. Conceptualization of the capacity gaps

5.1 Instructional design capacity gap: pedagogic decisions

Trends in pedagogic practices (Mason, 2003) are towards more active learning, particularly involving discussion and collaboration; faster, more flexible learning, particularly in work settings; and an emphasis on skills in locating, evaluating, analyzing, synthesizing and applying knowledge, rather than rote learning. Rather than all courses becoming inevitably wholly online, contemporary views suggest that separate from administration components such as enrolment, news and record management, effective support for such modern pedagogic practices requires a pragmatic mix of teaching components, including presentation components such as texts, video clips and databases; feedback components such as formative assessment tools and simulations; and communication components such as asynchronous text-based conferences, video-conferencing and instant messaging. Different components require kinds of different judgments by educators and trainers.

Presentation components: Some organizations have found (e.g. Peake et al., 2005) that putting teaching materials online can increase accessibility and flexibility, and make the materials easier to update, personalize, and reversion. However, when it comes to reading text, students still tend to prefer paper to screen. At the same time, database subscriptions can keep course content fresh and relevant. Educators and trainers, then, have decisions to make such as how much to put online, when to use audio and video rather than text, and which databases are worth subscriptions.

Feedback components: Enabling learners to test their own understanding has been found to build confidence, however such components are typically expensive to develop and can be ineffective if the feedback is inappropriate. Educators and trainers, then, have to decide where investment in interactive software development or purchasing is best directed.

Communication components: Online communication has been found to provide learners with new opportunities to interact with each other and with their tutors, and

text-based tutoring offers the potential of increased attention to the written word. However, a number of factors make it a rather different experience to traditional face-to-face tutoring, particularly the slower pace, the need for increased reading and increased selectivity in what to read, and the lack of body language, tone of voice and (arguably) emotional weight. Furthermore, students have been known to disengage from learning if computer conferencing is seen as "bolt-on extra" (Humphreys, 2002). Synchronous voice-based conferencing is becoming increasingly used, especially for language learning, and such software often includes multiple rooms, a collaborative whiteboard, voting, and document annotation. Another example of communication components is the joint construction of online databases (such as through a wiki or survey); because learners have collected the data themselves, they not only have a sense of ownership over the data and experience of working with others towards a common goal but they also have first-hand experience of the factors that limit the reliability of data collection. Educators and trainers, then, have decision to make about what activities learners should undertake, and the role of any tutors.

This pragmatic mix often leads to a flexible combination of DVDs/CD-ROMs (for video clips, audio clips, high resolution images and applications), the web (for text that needs regular updating, and for online databases), asynchronous conferencing (for some support and peer-to-peer interactions), textbooks or print materials (for lengthy reading) and face-to-face tutoring. Educators and trainers also then need to decide on the balance of components for particular aims and target learners. An overall design philosophy might also inform such decisions. For example, a social constructivist problem-based approach might be chosen, in which a group of learners identifies for itself the gaps in its collective scientific knowledge; divides into smaller groups that each explores the whole range of available resources with respective to a different topic; and then prepares seminars to teach their peers. The role of the tutor is then to help the group of learners as a whole to identify these gaps; to seek out resources that the sub-groups may find valuable; and then to correct any theoretical misunderstandings that arise. Alternatively, a stepped presentational approach might be chosen, in which teaching materials would be carefully constructed to build up knowledge gradually, with frequent formative assessment. Or simulations might be central, exploiting, say, video-conferencing or custom simulation software, in which the tutor plays a facilitation role encouraging private and collaborative participation and reflection. Surveys of learner experience play a role in evaluating the success of these kinds of decisions.

Nevertheless, pedagogy and logistics are not the only considerations: educators and trainers need also to be able to reflect on the suitability of their chosen aims, with awareness of relevant trends. Furthermore, sustainability demands a good grasp of the economics associated with e-learning. D'Antoni (2003), in a UNESCO collection of eight case studies of universities depending heavily on ICT, identifies a number of models that fail to take proper account of student demand, rapid technological change, student access to the technology, or the economics of production and presentation. For example, some estimates suggest that if 20% of a course is moved to ICT, with software developed from scratch, academic staff time can increase by 40%, production staff time can increase by 140% and tutorial staff time can increase by 20% (Peake, Aczel & Hardy, 2005). The "UK e-University" enterprise, meanwhile, is a recent example of a notable failure that may have its roots in false expectations about student demand (Select Committee on Education and Skills, 2005).

A key challenge therefore for the capacity builders is how to help educators and trainers gain experience of these kinds of instructional design decisions so that e-

learning developed by educators and trainers satisfies the success criteria identified earlier. This challenge was articulated by most of the case study NGOs.

5.2 Production capacity gap: developing tools & materials

What resources, skills and processes are needed for the development of tools and materials of the highest quality? The case study NGOs mostly do not identify skills of drafting, reviewing, revising or editing materials as lacking in their own e-learning developments, nor skills of leadership, project management or administration; but rather skills of developing products such as webpages, diagrams, podcasts or software. Yet these products are typically seen as crucial to enabling effective cascading of knowledge: NGO F, for example, emphasized a view that well-designed tools and materials can play a role in making up for tutors with a limited view of teaching as transmission of information from teacher to student.

The creation of extremely high quality learning materials can take substantial person-years of academic and specialist production effort. NGO E, for example, emphasized that the workload is high in the production phase of the course, as the course developers grapple with the demands of producing e-learning materials. However, there are increasing opportunities for some reuse of existing materials, provided by "open content" initiatives such as MIT's (MIT OpenCourseWare, 2005), which makes many learning materials freely available to self-learners across the world, or by community websites such as Wikipedia. Web-based community tools for teachers hold out the promise of the pooling and improvement of both teaching materials and professional skills.

A key challenge, then, for capacity builders is how to enable educators and trainers to develop these skills, or how to import them into the organization.

5.3 Tutorial capacity gap: facilitating and moderating

A distinction is sometimes made between those who create online courses ("course designers") and those who facilitate discussion and mark assessments ("tutors"). The course designers usually select the technologies to be used, write or commission the course materials, provide a structure of activities for the course, and set the assignments. The tutors, meanwhile, have contact with students. Of course the course designers and tutors might in practice be the same people. Either way, these roles are crucial to the success of e-learning. At one extreme, the tutors in NGO B are typically face-to-face and have a small online role; at the other, the tutors at NGO C are entirely remote from the students. NGO A has a mixed model of both online and face-to-face tutors. By contrast, NGOs D and F prefer to see the burden of teaching being borne by the materials rather than tutors.

Even with high quality materials, there is more to online tutoring than simply having knowledge and skills in the subject area and in technical matters (Salmon, 2004), although this in itself might be a challenge (Ondari-Okemwa, 2002). For example, text-based electronic discussions tend to be more extended over time and wordier than traditional face-to-face teaching; and more continuous than traditional distance teaching. This means that tutors run the risk of a substantially increased workload. Online tutoring is often perceived as more time consuming and online learners are perceived as more demanding than those on traditionally tutored courses. Tutors might need group management skills to promote effective online interaction that keeps their workload manageable (Humphreys, 2002). Tutors may feel the pressure of unknown expectations about their role: is it reasonable to respond to every

message? How many times a week can they be expected to log in? Are tutors responsible for answering technical problems? What to do about learners who prefer learning by rote to learning through discussion or by a critical attitude?

5.4 Community building capacity gap: exploiting knowledge management

Knowledge management promotes practices and technologies that facilitate the efficient creation and exchange of knowledge within communities of practice. Earlier, the distinction was discussed between a technological approach emphasizing knowledge codification, and a social approach emphasizing knowledge sharing. While development agencies have traditionally attempted to exploit the value of knowledge codification, exemplified by repositories of case studies and reports on best practice, there are also now many attempts to emulate the success of community websites such as *Wikipedia*, *Friends Reunited*, *Slashdot*, and *MySpace*, and the various consumer reviews websites such as *Amazon*. The hope, expressed by several of the NGOs, is to capitalize on the strengths of such virtual communities (Preece, 2000) for situated learning outside formal settings (Thorpe, 2002), while recognizing (with McGrath & King, 2004) that mutual engagement and joint enterprise (Wenger, 1999) can be difficult to engineer artificially.

As Thorpe (2002) puts it, the dream is that "Practitioners can have access to each other through online communities, not simply to 'repositories' of information, which promise much but have yet to deliver a great deal. In the fragmentation and pressure affecting many people's lives, asynchronous combined with synchronous modes of communication still offer advantages over face-to-face meetings at specific times and places."

For several of the NGOs, a vision of the future would be of the learning organization (Senge, 1990) using e-learning to share experiences, case studies and resources inside and outside itself, and buoyed by a steady income of revenue from education, training and consultancy. Yet although each NGO has unique sources of competitive advantage, it also operates in a context where there is a degree of competition for scarce resources. An alternative scenario is that while enthusiasm remains for the ideals of communities of practice, competition and technological, administrative or logistical difficulties keep the NGOs from this vision. Knowledge is not effectively pooled, except by word-of-mouth. There remain small numbers of expert trainers, drawing largely on printed text and lectures broadcast by satellite to ICT centres in major cities.

The technical requirements to support such communities are not a challenge in countries with good internet access – e.g. homepage, discussion area, repository, search engine, membership directory (Wenger, McDermott and Snyder, 2002) – although internet access is typically poor in the countries of the NGO case studies. Even if internet access were to dramatically improve, the profound challenge for the capacity builders is to discover what, if anything, might motivate self-directed learners to participate in knowledge sharing through such communities (McAndrew et al., 2004).

6. Strategies for addressing the capacity gaps

This study has hypothesized that there are four kinds of e-learning capacity gaps. We briefly consider the ways in which capacity building activities of the organizations might constitute strategic responses to these suggested gaps. We start with NGO B as an example.

In NGO B, early courses were customized versions of those at a leading European e-learning provider: the customization and the subsequent partnership were seen as means to develop the central e-learning capacity of the organization to produce e-learning courses that achieve the success criteria outlined above. This collaborative customization can be seen as constituting a strategy for individuals in the NGO to gain experience of instructional design decisions, and of processes to revise tools and materials.

In addition, NGO B is striking out for itself: it has developed a couple of programs ab initio, and is creating its own Virtual Learning Environment.

A third mechanism for capacity building at NGO B is through the induction of new course tutors, particularly through the use of mentors, a strategy that can be seen as helping to address the tutorial capacity gap.

NGO B also has branches in several countries, where both course tutors and faculty are based, so these staff add to the capacity of their respective countries. A fourth mechanism, then, is through these staff, when new courses at the NGO can cross-fertilize with national e-learning initiatives. The use of ICT to facilitate sharing of knowledge can be seen as representing a strategy for addressing the community building capacity gap.

A quite different approach was taken by NGO C, which described explicitly the choice it faced between waiting for the organic development of e-learning expertise within the country, and localizing existing online programs from abroad. The latter was chosen, in the hope that the NGO could act as a mediator for other organizations in the country in adopting the latest educational technologies.

NGO D, by contrast, wished to create its own materials from the start, with successive draft material to be reviewed by others engaged in capacity building and by e-learning experts, while NGO E expressed a keen desire to be directly involved in projects that translated small modules into e-learning components, and for there to be opportunities for detailed feedback. These activities can be seen as constituting strategies for building production capacity, with the possibility of helping to address the instructional design capacity gap too.

7. Concluding remarks

This study has looked at the perceptions that six NGOs have of the challenge of building capacity in e-learning expertise. They are primarily motivated to build capacity because (a) e-learning is seen as an effective means to train and educate, particularly to extend the geographical reach of experts in particular subject areas; (b) development funds are available to support capacity building in e-learning; and (c) the quality of e-learning is believed to be capable of improvement in terms of inclusivity, convenience, engagement, effectiveness, trustworthiness, and sustainability. The challenge of building capacity in e-learning expertise includes coping with an inadequate ICT infrastructure, lack of suitably skilled professionals, and internet access costs. There is hope that these barriers can be overcome, leading to greater independence from the dominance of richer countries. Criticisms of e-learning itself were not widespread amongst these pioneers.

Four kinds of capacity gaps were hypothesized – instructional design, production, tutorial, and community building – and illustrated using the data. In some ways, some activities of the NGOs can be seen as strategic responses to these hypothesized gaps, but further research is needed to test this.

We finish by offering some reflections on potential alternative strategies for targeting these gaps.

> "Technical cooperation programmes have often been effective in providing direct operational support – and can help getting the job done. The record is poor, however, when it comes to the training and transfer of know-how and to building sustainable capacity for managing development." (UNDP, 1994)

By analogy with this observation of the UNDP, a strategy of the organization emailing to e-learning experts the texts and presentations used for traditional forms of education and training, and receiving back a few months later materials suitable for e-learning would be unlikely to greatly help the organization develop its in-house e-learning capacities, except what can be gleaned from the comparison between before and after.

Another strategy is if an experienced e-learning developer worked on the transformations at each organization, or if the organization were to send staff to work with a developer. Staff from the organization could "watch over the shoulder" to see how the process works, and through such means aim to acquire the necessary knowledge and skills. However, how much could we expect would be learned in such a scenario? To gain a working understanding of the full cycle of course production might take around two years at a minimum. Add in the first year of presentation and another for orientation and the figure now looks like four years. So this is not a quick strategy.

We suggest that the notion of the "Critical Reader" might offer a well-defined way of providing targeted assistance. The idea of a Critical Reader is of a friendly reviewer, who by commenting on draft materials at various stages in the production cycle is able to help course developers improve their materials. In traditional distance learning, after many months of intensive effort, course creators can become too close to the material to notice some of the flaws, so Critical Reader feedback on course materials plays an important role, particularly on the level of the course, student workload, and educational effectiveness. To be of maximum benefit to an organization, Critical Readers should be experienced in the development of courses that make extensive use of ICT, and also familiar with the subject matter. In addition to enabling the quality and educational effectiveness of the particular instructional design and materials to be improved, the Critical Reader role would also target the instructional design and production capacity gaps: by studying the comments of Critical Readers, NGO can improve their skills in designing and producing effective education and training, following the cognitive apprenticeship model (Collins, Brown & Newman, 1989). NGO F alludes to the problems of integrating new human resources into an existing operation, and we suggest that this role represents a "short cut" to integration.

Another aspect of the production capacity gap relates to more technical matters: how to develop software, websites, and audio-visual components. Another strategy, then, centres on the idea of a "Media Developer" role, which, as with the Critical Reader role, offers a well-defined way of providing targeted assistance. Several of the NGOs have referred at various times to custom software development as being a desirable part of the resources they want to develop. For anything other than simple spreadsheet-based applications, Media Developers would be essential, to develop new software or advise on the availability of appropriate commercial software. It is not easy to develop in-house expertise in media development without recruitment. In the UK, junior Media Developers usually have a minimum of a computer science degree, with industry certification in one or more programming languages or other technical specialist areas. More senior Media Developers have several years of experience, and

might also typically have postgraduate qualifications. However, like Critical Readers, Media Developers can usually be based anywhere in the world that has a fast, reliable internet connection.

A further strategy to help address the hypothesized capacity gaps centres on the numerous attempts at developing international online communities for educators that hold out the promise of the pooling and improvement of both teaching materials and professional skills. Ultimately, these teaching materials would be stored in learning object repositories in a form that would facilitate ease of reuse.

However, a more radical "Web 2.0" approach might be possible, if the current default model for developing e-learning expertise is reconsidered. The model appears to start with the NGO and its particular mission; the instructional design capacity gap needs to be addressed first, followed by the production gap, then the tutorial gap, and finally – if the motivation is sufficient – limited attention might be given to community building. Is there an alternative model that might offer a more open, lively, holistic, and community-focused way of building capacity in e-learning expertise?

In these days of Web 2.0 thinking, it might be possible to start not with the NGO, but with some sort of community, broadly defined, even perhaps one day a world community. Groups with similar interests or ideals then form themselves out of this community, not necessarily constrained by geography or dominant socio-political movements. Then, independent groups form multiple initiatives to design, produce and tutor. These initiatives are all freely accessible, but members of the wider community would not just access the products; they could also contribute, and so refine the design, production and tutoring. By sharing expertise in this way, the capacity gaps can be bridged not just once, but continuously and sustainably.

Finally, we note that despite the immense challenge of building capacity in e-learning described by the NGOs in this study, great optimism was generally expressed about tackling the challenge and about the potential of e-learning itself to transform societies. Whether such optimism is justified is likely to become apparent within the next few years.

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