The Impact of E-Learning in Workplace: Focus on Organizations and Healthcare Environments

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Abstract: *Although there has been much research on e-learning in the educational context, far less has been written about e-learning in the workplace. The purpose of this review is to draw together what research has been done on e-learning in the workplace to inform future researchers. E-learning is one answer to sweeping global changes, labor market and productivity issues. The review shows that e-learning is being spurred on in Canada by three drivers: the global economic context, the human capital context, and the information and communication technology context. The paper shows that the employers can integrate individual learning with organizational needs and provide employees with the knowledge and skills they need. Thus employee receives the modules of information and learning that fit their current need. Cost effectiveness was cited as one top reason to use e-learning, especially for organization that are already using ICTs in their work processes. Researchers posited that ICTs are increasingly playing an important role in organizations and society's ability to produce access, adopt and apply information. In addition there is cost saving in terms of time. As in all types of working environment, but especially more so in the medical and healthcare environment where being complacent, negligence and out of date with work related advances could make the difference between life and death outcome in patients. There is a constant need to rapidly train and retrain the workforce in new technologies, products, and services found within the work place setting. Finally the paper looked into its benefits and barriers to e-learning.*

Keywords: *E-learning, Workplace, Internet, Organizations, Employers, Online learning, Information and Communication Technologies.*

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1. Introduction

E-learning is among the most important explosion propelled by the internet transformation.

E-learning has the potential to transform how and when employees learn. Learning will become more integrated with work and will use shorter, more modular, just-in-time delivery systems. E-learning delivers content through electronic information and communications technologies (ICTs). According to [2], the use of these facilities, involves various method which includes systematized feedback system computer-based operation network, video conferencing and audio conferencing, internet worldwide websites and computer assisted instruction. This delivery method increases the possibilities for how, where and when employees can engage in lifelong learning. Employers are especially excited about the potential of e-learning for just-in-time learning delivery. By leveraging workplace technologies, e-learning is bridging the gap between learning and work. Workers can integrate learning into work more effectively because they use the same tools and technology for learning as they use for work. Employers are most interested in the potential of e-learning for just-in-time, modular learning. Both employers and employees recognize that e-learning will diminish the narrowing gap between work and home, and between work and learning. E-learning is an option to any organization looking to improve the skills and capacity of its employees. With the rapid change in all types of working environments, especially medical and healthcare environments, there is a constant need to rapidly train and retrain people in new technologies, products, and services found within the environment. There is also a constant and unrelenting need for appropriate management and leveraging of the knowledge base so that it is readily available and accessible to all stakeholders within the workplace. The community housing e-learning project which is funded by the Australian Flexible Learning Framework provides the vocational education and training (VET) system with the essential e-learning infrastructure and expertise needed to respond to the challenges of a modern economy and the training needs of Australian businesses and workers. The Industry Integration of E-learning business activity will support industry sectors to embed e-learning in industry –led workforce development. The goal of the Indstry Integration of E-learning business activity is to help industry sectors meet workforce needs through the use of e-learning. For further information about this project please contact Laurel Draffen (Community Housing Employer Guide Draft One V2 July 2009). [13]

In section 2 the definitions of e-learning were considered based on different terminologies used. Section 3 discusses why e-learning is accepted now.

In section 4, ICT in workplace was examined and the benefits it offers to organizations. Section 5 discussed what to expect when one embark on e-learning in workplace. In section 6 and 7 e-learning in hospital setting was considered and Malaysian medical Health care was cited as a case study. Section 8 discusses the benefit and barriers of e-learning. Finally section 9 draws the conclusion that e-learning has the potential to transform how and when employees learn.

2. Definition of E-Learning

E-learning is not only about training and instruction but also about learning that is tailored to individual. E-learning is said to be:"pedagogy empowered by digital technology" [17].

Different terminologies have been used to define learning that takes place online, a fact that makes it difficult to develop a generic definition. Authors agree that a single definition for e-learning has not yet been found. Terms that are commonly used to define online learning include e-learning, Internet learning, distributed learning, networked learning, tele-learning and telematics distributed learning [6], [1], virtual learning, computer-assisted learning, Web-based learning, and distance learning. E-learning covers a wide set of ICT technology-based applications and processes, including computer-based learning, Web-based learning, virtual classrooms, digital collaboration and networking. It includes the delivery of content via Internet, Intranet, and Extranet, satellite broadcast, audio-video tape, interactive TV and CD-ROM [14]. Nonetheless, the different terminologies point to a similarly conceived educational experience. All of these terms imply that the learner is at a distance from the tutor or instructor, that the learner uses some form of technology (usually a computer) to access the learning material, and that the learner uses technology to interact with the tutor or instructor and other learners, and that some form of support is provided to learners [1].

The term E-learning brings together different fields as highlighted in the following definition: “E-learning is the unifying term to describe the fields of online learning, web-based training, and technology-delivered instruction” [20]. The following definitions of e-learning highlight the use of computer and communications technology in this process. E-learning is an approach that facilitates and enhances learning through both computer and communications technology. Such devices can include personal computers, CD-ROMs, Digital Television, Personal digital assistants (also called PDAs) and Mobile Phones. Communications technology enables the use of the Internet, email, discussion forums, collaborative software and team learning systems. E-learning may also be used to support distance learning through the use of Wide area networks (or WANs), and may also be considered to be a form of flexible learning where just-in-time learning is possible. Courses can be tailored to specific needs as either synchronous (in real time) or asynchronous learning (stored for use later on). Where learning occurs exclusively online, this is called online education. When learning is distributed to mobile devices such as cell phones or PDAs, it is called m-learning [21].

3. Why E-Learning Now?

Despite a high standard of living, Canada is falling behind other countries because of its relatively poor innovation and productivity performance. E-learning is one answer to sweeping global changes, labor market and productivity issues. E-learning affords small and medium-sized enterprises (SMEs), as well as large organizations, an opportunity to provide workplace learning, and it gives Canada a chance to close its “digital divide” through the development of e-literacy. E-learning is being spurred on in Canada by three broad drivers: the global economic context; the human capital context; and the information and communications technology context.

E-learning can be viewed as a means of delivering three key outcomes: improved and consistent rates of lifelong learning, improved productivity and improved innovation and competitiveness. Another desired outcome is increased equity. The issue of equity raises questions that need to be addressed now. Do Canadians currently have access to these learning technologies, is access to e-learning equally distributed by income, age and educational levels, and are barriers to e-learning such as cost and lack of information, time and content being addressed? E-learning, like all learning, should yield outcomes that benefit society and the economy. The Statistics of Canada’s most recent Adult Education and Training Survey report notes:

It is not enough, though, to look only at economic factors—income, employability and firm productivity…. In assessing the appropriate level of adult learning in Canada, individual benefits extend beyond the market payoffs of higher wages or employment. It is now well documented that learning leads to better health and other favorable outcomes for family, community and country [11]. Knowledge is a key determinant of sustained economic growth because knowledge, unlike other factors of production, is not subject to diminishing returns [3].

4. ICT In The Workplace

There is a positive relationship among information and communications technologies, labor productivity and total factor productivity. 14 Studies have also demonstrated a relation between the prevalence of ICTs at work and the rate of workplace learning.

Statistics Canada's 1999 workplace and employee survey found a relationship between rates of computer technology adoption and higher levels of computer-related training. Knowledge and innovation are the keys to Canada's productivity, and e-learning is one of the most effective ways to share the knowledge developed through innovation. [19], Opined that a nation route to becoming a successful knowledge economy is its ability to also become a learning society. Given that Canada does not perform as well as its main economic partner, the United States, on productivity and workplace education, [18] e-learning is one way to give Canada a stronger global position.

In particular, e-learning offers small and medium-sized enterprises an unprecedented opportunity to improve their economic performance and is a potential solution to Canada's digital divide.

4.1. Just-In-Time Learning

Employers emphasized just-in-time training as one of the premium value-added features of e-learning. E-learning is flexible. Employers can integrate individual learning with organizational needs and provide employees with the knowledge and skills they need when they need them. Employees do not have to take entire courses; instead, they can receive the modules of information and learning that fit their current needs. E-learning is especially effective at linking learning with work. Employers can design training systems that use equipment and technologies that are already part of organizational processes. In addition, e-learning allows employers to build a learning component into their employees' work. Learning "in the work" is increasingly seen as an effective and valuable way of delivering just-in-time learning. "Employer-sponsored training [linked with work] has important advantages, including financial support, accommodation of time demands, and the productivity benefits of applying training in a real work situation" [7]. Content design and delivery can be customized to meet learning needs immediately [10]. With e-learning, customization may also be easier and faster, and the quality of the content and instruction may be improved, due to increased access to experts, multiple program choices and the availability of different learning delivery methods. In short, e-learning provides the opportunity for learning on the job of what is needed, when it is needed, through the information and communications technologies that are part of the work. While providing seamless just-in-time learning "in the work" may be challenging, employers indicate that this is the most valuable feature of e-learning.

4.2. Cost-Effectiveness

Cost-effectiveness was cited as another top reason to use e-learning, especially for organizations that are already using information and communications technologies in their work processes. Significant savings stem from reduced travel expenses. Traditional classroom and off-site training involves moving people to and from the training location, as well as providing time off work. The other aspect of cost-effectiveness is the value-added realized by using ICTs for both work and learning. Another major cost saving is in terms of time; some have noted that more focused content reduces learning time because employees are able to focus on the knowledge they really need, when they need it. Others noted the gains in terms of improved learning outcomes and productivity, and reduced safety and compliance and infringements.

4.3. Employee Control Over Learning

Today's workplace is increasingly defined by a new employer–employee relationship. The employer provides the tools, such as e-learning, to employees. Employees, on their part, manage and develop their skills and employability and ultimately are responsible for maintaining the value they add to the company. Employers expect that employees will be responsible for their own training if they are provided with the necessary tools, support and time. Some employers felt that e-learning can provide improved access to learning opportunities and a safe, non-judgmental learning environment.

E-learning, (asynchronous or synchronous) encourages information sharing, collaboration and interaction. Asynchronous activities use technologies such as blogs, wikis, and discussion boards. The idea here is that participants may engage in the exchange of ideas or information without the dependency of other participants' involvement at the same time. Synchronous activities occur with all participants joining in at once, as with an online chat session or a virtual classroom or meeting [10]. For example, employees can e-mail one another while participating in an on-line learning program, or listen to and see each other through live video and audio. Instructors, too, often find it easier to interact with employee-students when they are using e-learning. E-learning can also improve employees' retention of knowledge, which benefits job performance. Some employees find that they retain more, because e-learning particularly suits their personal learning style. Others retain more because the learning is built into the work itself and so is obviously relevant to job performance. For them, seamless and timely learning "in the work"— learning that is directly tied to job tasks and responsibilities—stimulates them to retain more than do traditional learning processes. E-learning can motivate employees to invest more time and energy in workplace learning. The key is that the alternative and flexible learning environments allowed by technology

can reduce psychological obstacles as well as the practical difficulties of scheduling learning activities around work periods. The result is more personal commitment to and control over learning.

5. E-Learning in The Workplace –What To Expect

A wide range of learning approaches exists already, for example e-learning, blended learning, and distance learning which utilize information and communication technology (ICT), [16].

Completing a training course using e-learning means that a participant may be involved in a range of activities. Traditionally we are used to staff attending a training session for a period of time – a full day, two days or half a day for example. Using e-learning, you may see staff participating in any of the following learning activities:

- Interactive sessions at their computer with other participants and an e-learning facilitator who are online, or communicating via the phone
- Completing activities at the computer that are available from a structured learning site, designed specifically for the course
- Downloading (and possibly printing) course material to read
- Researching information from other websites
- Listening to a podcast
- Viewing a YouTube video or similar
- Posting comments to an online chat forum, such as a wikis pace
- Completing an assessment task online
- Attending a face to face session facilitated by a trainer to further investigate course content and concepts
- Discussing content or seeking advice from colleagues in relation to the course material.

6. E-Learning In Hospital Setting

During the last century, we have moved from the Industrial Age through the Information Age and now, to the Knowledge Age. The ability to obtain, assimilates, and applies the right knowledge effectively will become a key skill in the next century. Learning is the key to achieving our full potential. In fact, our survival in the 21st century as individuals, organizations, and nations will depend upon our capacity to learn and the application of what we have learned to our daily lives. Learning at the workplace is essential for an individual, an organization, or even a nation, to thrive in the 21st century. Learning at the workplace, specifically in the context of healthcare setting, may include simple steps such as observing and learning from peers or superiors, on-the-job training, applying healthcare guidelines to everyday work, and including the complex steps involving formal learning resulting in certificate qualifications.

In a survey performed in the UK, it was found that the majority of e-Learning occurs at the workplace, although nearly a third of e-learners do most of their e-Learning in the comforts of their homes. The Web is the means reported as the most preferred for people to do their e-Learning; however, directed learning methods such as packaged courses in CD-ROMs are also favored by a significant number of the participants of the survey, especially among those working in the private sector. It was also revealed that involvement with e-Learning tended to be work-related and on those required by employers, although personal interests outside of their work scopes are also a significant motivator. The survey also found that facilities were in place for e-Learning in most organizations. Almost all have some computing facility for employees to access e-Learning materials, although this tended to be limited. The majority of e-learners have positive associations with e-Learning, although there were mixed views on this issue, and the less educated tended to be less positive. E-Learning was thought to be more convenient, allowing people to work at their pace and to gain fast access to information [5].

7. Learning And Training In The Medical And Healthcare Setting In Malaysia

Education and training in healthcare is an essential and continuous activity for healthcare providers. In 1996, the Ministry of Health of Malaysia spent approximately RM 91.9 million or 4.5% of its total operational budget for both basic and post basic/postgraduate training. Continuing Medical Education (CME) or what is currently termed ‘‘Continuing Professional Development (CPD)’’ is deemed compulsory for all healthcare professionals, to ensure that knowledge, skills, and competencies are not only maintained but also regularly updated and upgraded. The current CME system has many unresolved problems and issues such as the high cost of establishing and maintaining physical training facilities, difficulty in meeting changing demands consequent to demographic, disease trends and knowledge economy changes as well as staff shortages in the deployment of knowledge workers, all these arising from the relatively long duration in training and unattractiveness of rural settings. It was with this scenario in mind that the Ministry of Health came up with the CME application nested within the national TeleHealth Project. With the CME application, delivery of CME will be facilitated by online delivery, in other words, transforming traditional CME delivery into e- Learning [8] (Concept Request for Proposal, Ministry of Health, 1997). As in all types of working environment, but

especially more so in the medical and healthcare environment where being complacent, negligent, and out-of-date with work related advances could make the difference between life or death outcomes in patients, there is a constant need to rapidly train and retrain the workforce in new technologies, products, and services found within the workplace setting. There is also a constant and unrelenting need for appropriate management and leveraging of the knowledge base so that it is readily available and made accessible to all members of the workforce within the workplace environment. In addition, within the medical and healthcare setting, certain other factors reinforce this need for constant refreshing, training, and retraining of its workforce [11].

8. Benefits of E-Learning

Research suggests that there is no significant difference in educational outcome between e-learning and traditional classroom training, which means that your training goal can be reached irrespective of the training methodology. However, e-learning offers significant economic and social advantages over traditional classroom training. These benefits are listed below.

8.1. Anytime, Anywhere, Any Place.

Using CD-ROM or Internet technologies, e-learning can be delivered on-demand, when and where it is needed, both on-site and off-site. Companies retain valuable employees longer, because they can be trained on the job.

8.1.1. Time Reduction.

Because of the nature of e-learning with its visual and auditory reinforcement of information, and individualized feedback mechanisms, the time taken to learn the information is significantly reduced. Research indicates time reduction of the order of 30–50% is common. Because employees spend less time training, companies pay less for lost productivity. E-learning also can be delivered as 'just in time' training, reducing the period between the learning and application of the knowledge or skills, which enhances the learning process. In some cases the e-learning course can be delivered while the learner is on the job.

8.1.2. Increased Payback.

E-learning is an investment that increases its payback during its lifetime, as its primary costs are incurred during development. Delivery and maintenance costs are relatively low. Therefore, unlike instructor-led learning or paper-based communication, the per user costs for e-learning decrease. Most research indicates an average cost saving on training is in the range of 25–65%. Companies can save their training budgets when instituting e-learning courses within the firms.

8.1.3. Flexible Access.

One of the biggest challenges in implementing training within organizations is the scheduling of training. E-learning accommodates individual styles of working and learning, and allows learners to access and review the lessons they need at times convenient to them. This self-directed approach puts people in control of their learning. This equality of access by all involved in the training is one of the important and appealing aspects of e-learning. And unlike face-to-face training, e-learning can be revisited by the learner as often as they desire.

8.1.4. Reinforcement.

Research indicates that 20% of information is retained after six weeks in a traditional classroom setting, but up to 70% is retained, because e-learning approaches allow learners to 'see, hear and do'. E-learning can result in a deeper understanding and positive attitudes towards the subject area. Learners participate where they live and work, retaining an orientation to their surroundings. They are typically more comfortable in expressing their

Opinions, leading to more frequent, yet higher quality discussions when compared to traditional settings.

8.1.5. Motivation.

Interactive lessons are advantageous for skill building because the computer has the ability to provide immediate feedback to the learner's questions or responses, and take the learner through the steps to find the right answer. Media elements, such as video, animation and sound, get the learners involved more quickly and keep them motivated to continue.

Experience indicates learners who feel shy or intimidated in a traditional classroom setting or (Community Housing Employer Guide Draft One V2 July 2009) [13] who may be resentful of their trainer, are more likely to participate in a virtual setting. There are similar benefits for minority groups.

8.1.6. Community Building.

Virtual learning communities can share vast knowledge and experiences that exist within their company or a field, as well as motivate each other. Within an organization, an e-learning program can be used to reinforce the culture and values of that organization.

8.1.7. Monitoring of the Learning Process.

Most e-learning allows instant and easy monitoring of the progress of learners, particularly when it is

combined with a learning management system. Such monitoring may be critical for areas where there may be legal implications, such as induction training and occupational health and safety training.

8.2. Barriers

A major barrier to e-learning is the challenge of changing mind sets that are still locked into the traditional models of training delivery. The main barriers to a successful e-learning program are the lack of a learning culture in the organization, a lack of knowledge about e-learning, a lack of expertise in this area, a perception that e-learning will not add value to the organization, and simple reluctance to change. There are two main groups whose cooperation and support are critical for the development and implementation of e-learning: the management of the organization, and the learners themselves. Taking the time to work with the learners to get their support and ownership will ensure success when the course is launched.

8.2.1. Difficulty With IT

One of the biggest frustrations can be when IT systems do not work. There may be a period of time when new users experience difficulty in accessing the e-learning environment - good IT

Support in the early stages of technical problems is important. Be prepared to endure a certain level of frustration with IT in the early stages. Some staff may not be confident with new technologies or be prepared to spend the time required to ensure everything is working well. When technology is working well we can appreciate all it enables us to do. When it does not work smoothly we are tempted to get frustrated and dismiss the experience too readily. Remember this is a change process, so you need to support a period of transition.

9. Conclusion

Embracing e-learning by organizations is not just a good idea, but it is necessary. E-learning has the potential to transform how and when employees learn. E-learning delivers contents through electronic information and communication technologies (ICTs). Workers can integrate learning into work more effectively because they use the tools and technology for learning as well as for work. Knowledge and innovation are the keys to Canada's productivity, and e-learning is one of the most effective ways to share the knowledge developed through innovation. Learning at the workplace, is essential for an individual, an organization, or even a nation, to thrive in the 21st century. The national healthcare in Malaysia is not exempted from e-learning in the workplace. Maximizing e-learning will provide the support it needs to attract and retain the very best healthcare professionals. Successful organizations have always invested in their people. The greater the amount of learning and training that goes on within an organization, the better the performance and the competitive edge.

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References

[1] Ally, M. (2004). Foundations of Educational Theory for Online Learning. In T. Anderson & F. Elloumi (Eds.), *Theory and Practice of Online Learning* (pp. 3-31): Athabasca University & Creative Commons.

[2] Ajayi, I.A. (2008). Towards effective use of information and Communication technology for teaching in Nigerian colleges' of education. Asian J. Inf. Technol. 7(5): 210 – 214.

[3] Applied Research Branch, Strategic Policy, Human Resources Development Canada, *Technological and Organizational Change and Labour Demand: The Canadian Situation*, R-97-1E (Ottawa, October 1996).

[4] Aribisala, J.O. (2006). Role of information and communication Technology in globalization. In Agagu AA (ed). Information and Community Technology and computer applications. Abuja: Panof Press pp. 68 – 76.

[5] Attitudes to e-Learning: a national survey. Campaign for learning, KPMG, Ufi and Peter Honey learning. Malaysia: Southgate Publishers, 2000.

[6] Bates, A. W. (2005). Distance Education in a Dual Mode Higher Education Institution: A Canadian Case Study [Electronic Version]. *Centre for Distance Education, Korean National Open University*. Retrieved Nov. 13, 2005 from http://www.tonybates.ca/papers/KNOUpaper.htm.

[7] Betcherman et al., *Barriers*, p. 60.

[8] Concept request for proposal. Telemedicine flagship application. Continuing medical education. Malaysia: Ministry of Health, 1997.

[9] Chen, X. (2009).E-learning application and challenges. Second International Conference on Future Information Technology and Management Engineering. 978-0-7695-3880-8/09, 2009,IEEE.

[10] Donna Abernathy, "A Start-up Guide to Distance Learning," *T+D Magazine*, December 1997, pp. 39–47.

[11] Gilles Bérubé, Wendy Salmon and Albert Tuijnman, *A Report on Adult Education and Training in Canada: Learning a Living*, 81-586-XIE (Ottawa: Statistics Canada and Human Resources Development Canada, 2001), p. 5.
[12] Harun, M.H.(2002). Internetand higher education 4(2002) 301-310.
[13] Community Housing Employer Guide Draft One V2 July 2009.
[14] Kaplan-Leierson, E. E-learning glossary. Retrieved on January 10, 2006 from http://www.learningcircuits.org/glossary.html.
[15] Macpherson, A.; Elliot, M. ; Harris, I. and Homan, G. (2003). *Reflections on E-learning: Pedagogy and Practice in the Corporate Sector*, Working Paper (WP03/01), Manchester: Manchester Metropolitan University Business School Working Paper Series
[16] Maier, R. (2007): Knowledge management systems. 3rd Edition, Springer, Berlin.
[17] Nichols, M. (2008). E-Learning in context. http://akoaotearoa.ac.nz/sites/default/files/ng/group-661/n877-1---elearning-in-context.pdf
[18] Performance *and Potential (2000).* The Conference Board of Canada.
[19] Sharma, R., Ekundayo, M. S., & Ng, E. (2009). Beyond the digital divide: policy analysis for knowledge societies. *Journal of Knowledge Management, 13*(5), 373-386.
[20] http://agelesslearners.com/intros/elearning.html. Retrieved on November 15, 2005.
[21] http://en.wikipedia.org/wiki/e-learning retrieved on November 15, 2005.

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