

IMPROVING BUSINESS PERFORMANCE WITH WEB 2.0 TECHNOLOGIES

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Received: April 09, 2011; Accepted: April 17, 2011

Abstract- This paper explores the role of emerging Web 2.0 technologies in the workplace in terms of current trends, e-learning, and the value these new e-learning technologies can potentially provide organizations. This research first reviews the literature in terms of current practices, benefits, and challenges, and defines several applications of Web 2.0 technologies used in the workplace. The study then reports on the results of a survey of Maine businesses that was conducted to assess what Web 2.0 technologies they'd like to use in their organizations, their perceptions of these different technologies, and the potential benefits to their organizations. Results indicate that while most business respondents are aware of the time and cost savings benefits of technologies in the workplace, most were not aware of the emerging technologies such as Wikis, blogs, free open-source apps, or the benefits they could provide for knowledge sharing. We conclude that there is great potential for businesses to adopt a variety of e-learning technologies to facilitate training initiatives, resulting ultimately in performance improvements and enhanced competitive advantage.

Key words - e-learning, workplace, web 2.0 technologies, telepresence, asynchronous learning, synchronous learning, online virtual environments, gaming, simulations

Introduction

According to a survey by the American Society for Training and Development (ASTD), firms that invest more in employee training experience about 24 percent higher gross profit margins than those who invest less. Another example of the value of learning was IBM's global study on competitive advantage (O'Driscoll et al, 2005). The bottom line from this research was that sustainable competitive advantage resulted from continual innovation, increased productivity and transformation, enabled by employee learning. Another survey by Aberdeen Research (Martin, 2008) confirmed this assertion, surveying 535 Human Resource Managers on the value of learning to improved process improvement and competitive advantage. Table 1 show his categorization based on development of industry average baselines. Results of these surveys demonstrate a strong correlation between learning and best-in-class status where 73% of the best-in-class companies integrated learning strategies with overall organizational strategies. They devoted significant resources to learning, resulting in improved skills and competencies. In addition, they developed processes to manage the human capital via knowledge management to promote knowledge sharing and effective knowledge use.

Organizations are also recognizing the value of distance education and training. In a knowledge-based economy, success and competitive advantage comes from continual learning. A portfolio of learning modules suited to the

needs of the organization as well as the tools and technologies to make them readily and easily available would provide this learning potential. Hyland (2009) also reported some quantifiable benefits of e-learning.

Table 1- Martin's Competitive Framework Definitions

| | |
|------------------------|--|
| "Best in Class – 20% | Practices that are the best currently being employed and are significantly superior to the industry average. |
| Industry Average – 50% | Practices that represent the average or norm in an industry |
| Laggards – 30% | Practices that are significantly behind the industry average." |

The benefits from training included increased customer satisfaction as reported by 96% of respondents, increased profits (88%) and increased productivity (83%). This study also reported that e-learning resulted in more cost reductions, higher levels of learner engagement, and better training for people when and where it was convenient for them. This author also recognized the huge potential for improved and increased e-learning from new, emerging technologies such as podcasts, video-in-demand, and computer simulation games among others.

This paper offers an overview of the potential for improved e-learning via new and emerging Web 2.0 technologies and presents recommendations for managers. We suggest

that by exploring different technologies based on different situations and learning styles, organizations can improve their knowledge base and expertise of employees, thus providing the requisite source of sustainable competitive advantage in difficult economic times.

Literature Review

1.0 The value of e-learning to the corporate world

The 2005 study by IBM referenced earlier on the value of learning in the organization revealed that the continual development of employee knowledge and skills is needed to create a competitive advantage, increase efficiencies and productivity (O'Driscoll et al, 2005). Newer research is finding that traditional learning methods are not proving effective in helping employees learn the crucial skills and knowledge to achieve organizational goals. Rather, there is a shift to different forms of learning. O'Driscoll et al, (2005) found that there has been a significant shift to e-learning. In addition, learning is trending towards smaller chunks or modules on specific topics. The idea is that e-learning focuses on defining problems and matching solutions to specific company needs. In addition, these e-learning solutions can be 40% less expensive than traditional courses while providing greater efficacy and measurable results; e.g. how a specific problem or issue is addressed.

Workplace learning is also linked to higher customer satisfaction, employee satisfaction, increased sales, profits and productivity (Hyland, 2009). It should be noted that a "build it and they will come" approach will not work. Workplace learning must be relevant, interesting, and meet the needs, work and time demands of employees. Those requirements correlate with the dramatic increase in e-learning trends across the globe.

Another interesting benefit of e-learning in the workplace relates to the increasing globalization of the business world. This applies to educating employees about the company itself; its core values, mission and goals as well as the products and operations of the company. In addition, companies have found that if they neglect the cultural dimension of learning, they suffer often dramatic failures. This results from not teaching managers going into new cultural environments the norms, values and artifacts that are critically important to effective communication not only with employees, but with customers as well. A study by ASTD (Edmundson, 2009) found that only 35% of multinational companies taught their employees the basic skills in international operations, industry knowledge or international orientations. In addition, only 25 % taught cultural training sessions for managers or employees. It is not surprising then that only 28% of manager's surveys thought that their global operations were successful.

Therefore, it becomes clear that training in the workplace is crucial for knowledge and skill development as well as internal operations, cultural awareness, effective communication among many other functions for continual improvement and competitive advantage. It also becomes

clear that e-learning is the face of the future with lower costs, more effective and efficient delivery mechanisms, and flexibility in responding to the dynamic, changing needs of the market, the company and the employees. A business survey by Brightwave (Anonymous, 2009) showed that spending on traditional employee education will be greatly reduced while spending on e-learning will increase correspondingly. Furthermore, another study of 300 organizations found that 50% of them expected to increase their budgets for e-learning technologies with the expected results in developing a better qualified workforce (Overton, 2009).

2.0 Current trends & emerging technologies in workplace e-learning

Echols (2009) asserts that in today's society, learners need more flexibility in their educational delivery methods. As downsizing continues, workers are becoming more and more time-starved in their jobs, making it increasingly difficult to devote time to learning. A new, non-traditional cyber-learning model is emerging that supports user-friendly software that supports competencies and capabilities that are geared toward the working adult learners needs. It also supports networks of integrated platforms that cross link subject expertise that would be relevant to business needs and goals.

A study by Hall (2009) identified five major trends expected in workplace e-learning as shown in Table 2.

Table 2- Developments in Workplace E-Learning (Hall, 2009)

"1. Mobile learning: has advanced considerably and now is on the edge of widespread use in the corporate environment. Microsoft for example uses its Academy Mobile product internally to reduce costs associated with traditional content development and delivery. For example, the company's podcast series — a monthly on-demand, on-the-go audio briefing — features interviews with product experts and top salespeople to help the sales staff effectively sell Microsoft products to enterprise customers."

"2. Do-it-yourself (DIY) learning: Learning in the workplace increasingly provides more choices for learning. This means that to get the best material and the right expert, employees must be contributors, as well as consumers, of the learning material in DIY learning systems.

"3. Flexible learning environments: Driven by Web 2.0 tools such as social networks and the expectations of Millennial workers there will be transitioning from 1.0 to 2.0 platforms. Sun Microsystems' new environment for Web 2.0 learning provides more collaborative, modern mash-up features that combine search, formal and informal learning assets, training plans, comments, tagging and ratings."

"4. Virtual worlds: Are gaining popularity. Organizations have started conducting feasibility testing on the use of virtual worlds for workplace learning. An example of this is

IBM's Green Data Center in Second Life. It demonstrates how technology can reduce the energy consumption of a corporate data center. Another example, in nursing education, students can work in virtual labs and be at the bedside of virtual patients. This greatly reduces the expense of creating a real world lab or finding internship sites.

5. Games and simulations: Games and simulations have also now found their way into workplace training.

Problem Statement

Despite the rapidly growing use of e-learning platforms for teaching in schools and universities, businesses have been slower to adopt e-learning platforms to train employees. According to O'Brien and Hall (2004) small and medium sized enterprises (SME's) in particular have been very slow in adopting e-learning platforms to train their employees. O'Brien and Hall (2004) cited several specific reasons for SME's slow crawl to e-learning platforms to train employees that include; technical shortcomings, organizational policy, and the culture of the organization often impede an SME's ability to adopt new training platforms easily and quickly. O'Brien and Hall also pointed out that much of the commercial e-learning platforms that exist are made almost exclusively for school and university settings and have not been designed to address the specific training needs of an SME.

Further dissuading SME's to invest in e-learning is that the need for businesses to reduce costs has been exasperated by the economic downturn. Sachs (2010) stated that the global economic downturn has forced businesses around the globe to be even more reluctant to invest in new technologies due to the uncertainties related to when and how financial recovery will take place. All of these obstacles; 1) characteristics of the SME's organizational policy, culture, and technical shortcomings, 2) lack of e-learning platforms designed specifically for business training, and 3) the uncertainty related to our economic recovery combined all contribute to the slower adoption of e-learning platforms for training purposes in SME's.

Given all of the reasons for businesses not to invest in new technologies, this study argues that the economic downturn makes it crucial for businesses to invest in new technologies associated with training employees to maintain competitive.

Research Methodology

A survey titled: *U. Maine Business School invites business professionals to participate in workplace e-learning study* was developed and posted online at the Maine Career Center website's homepage and on the Portland Chamber of Commerce's website. Additionally, the Androscoggin Chamber of Commerce emailed the survey hyperlink to its top SME constituents. The survey which consisted of only eight questions asked that only managers, organizational

leaders, and business owners complete the survey and was available for two months.

Subject Recruitment

The primary outlet used to recruit subjects for participation in this study was a hyperlink of the study posted on the Maine Career Centers website listed on the homepage under Career Center News. By clicking on the hyperlink interested participants were directed to the Informed Consent Statement, which stated that participation was voluntary and by clicking the "next" button they agreed to participate in the study. The next button opened up the web-based survey. The secondary methods of subject recruitment included posting the web-based surveys hyperlink and directions on completely the study on the Portland Maine's Chamber of Commerce website. Participants that clicked on the hyperlink also were directed to the informed consent statement and then agreed to participate by clicking the "next" button which also opened up the web-based survey. Finally, as stated above under research methodology, the President of the Androscoggin Chamber of Commerce, also in Maine, emailed the survey hyperlink to its top SME constituents. In total 65 subjects were recruited.

Requirements for Voluntary Participation in the Study

To participate in the study participants had to be a manager, organizational leader, or business owner. Additionally, participants that agreed with the Informed Consent Statement were required to complete the eight question survey. The eight in the survey are presented below:

1. What e-learning platform(s) is your organization currently using to train employees?
 - Mobile learning
 - Do-it-yourself (DIY) learning
 - Virtual training environments
 - Games and simulations
 - Asynchronous online learning
 - Video conferencing
 - None of the above
 - Other
2. If given the opportunity, which e-learning platform do you believe would be the most useful to your employee training program?
 - Mobile learning
 - Do-it-yourself (DIY) learning
 - Virtual training environments
 - Games and simulations
 - Asynchronous online learning
 - Video conferencing
 - None of the above

3. Based on your response to Q2, why do you believe your choice would be most useful to your employee training program?
4. Based on your response to Q2, do you feel that your organizations employees have the technical skills required to participate in your chosen e-learning platform?
 - Definitely yes
 - Probably yes
 - Maybe
 - Probably not
 - Definitely not
5. What benefits do you think your organization would gain from incorporating your chosen e-learning platform?
 - Time savings
 - Cost savings
 - Other
6. What resource issues would keep your organization from incorporating your chosen e-learning platform into your training program?
 - IT resources
 - Financial resources
 - Technical proficiency of trainers
 - Technical proficiency of employees
 - Other
7. How many employees does your organization have?
 - 1-100
 - 100-500
 - 500 or more
8. What industry is your organization in?
 - Retail
 - Healthcare
 - Banking and finance
 - Technology (hardware, software, web development, etc...)
 - Manufacturing
 - Construction
 - Education
 - Other _____

Study Findings

This section presents the findings of this study based upon the responses provided by business managers, leaders, and owners. The data for this study was analyzed using SPSS. Tables 2 through 8 show the major frequency distributions. Table 9 shows the distribution of company sizes and Table 10 shows a breakdown of the industries in the survey. The data was analyzed using SPSS to look at frequency distributions and cross tabs of size and industry correlations with the other variables. At the end of the two

month survey period the results of the survey generated the responses presented below.

Results

Table 3- What e-learning platform is your organization using to train employees? (n=65)

| | | |
|---|----|-----|
| Mobile Learning-- Access training content via mobile devices such as laptops and Smart Phones | 12 | 18% |
| Do-It-Yourself (DIY) Learning-- Access training content via web blogs and other social networking tools like YouTube and Twitter | 19 | 29% |
| Virtual Training Environments -- Providing training in online virtual worlds like Second Life and Google's Lively | 4 | 6% |
| Games and Simulations-- That provide workplace training opportunities | 4 | 6% |
| Asynchronous online learning-- employees complete or participate in online trainings at a time and location that is convenient for them | 23 | 35% |
| Video Conferencing-- training employees using video conferencing technologies such as Skype, Polycom systems, etc... | 14 | 22% |
| None of the Above | 20 | 31% |
| Other: Please write in the text box below any other e-learning platforms | 8 | 12% |

Table 3 shows that there are still a large percentage of companies (31%) that do not yet use any e-learning technologies. Another very large segment (35%) still uses asynchronous technologies. These are often web-based training modules such as online videos, online content, online exams, etc.

Table 4- Other e-learning platforms used in respondent organizations (n=65)

| |
|--|
| webinars |
| web based training with conference calls and follow along with power point presentations |
| webinars |
| in person training |

| |
|--|
| We have our own procedures in place and use them as a training tool with a lot of hands on training. computer system SAP |
| Blackboard |
| Attending Conferences |

Table 4 reinforces this with respondents indicating that they still use and value in-person training as well as the traditional asynchronous methods. This appears to demonstrate that many companies (66%) are not using and perhaps not aware of the e-learning platforms available or do not understand their potential capabilities. Thus, there appears to be a cultural and informational issue that is preventing organizations from adopting these newer technologies and possibly inhibiting their competitive advantage in the marketplace.

Table 5- Which e-learning platform do you believe would be the most useful to your employee training program? (n=65)

| | | |
|-------------------------------|----|-----|
| Mobile Learning | 4 | 6% |
| Do-It-Yourself (DIY) Learning | 17 | 26% |
| Virtual Training Environments | 9 | 14% |
| Games and Simulations | 11 | 17% |
| Asynchronous online learning | 10 | 15% |
| Video Conferencing | 12 | 18% |
| None of the Above | 2 | 3% |

Table 6- Major responses on why respondent selected e-learning in Table 5

| |
|---|
| Most employees are time-starved and need systems that are convenient to their schedules |
| Geographic constraints and distributed work places require e-learning capabilities |
| Simulations, games and social networking are already used and therefore comfortable to employees. They are also fun and engaging. |
| DIY and hands-on learning engage learners and facilitate the learning experience |
| Video-conferencing simulates the live experience and helps develop relationships |

Tables 5 and 6 demonstrate that respondents are interested in these new technologies primarily because most companies and their employees are time and resource starved. This creates a need for training that is not restricted by time or location and can meet the on-demand needs of the employee's busy schedules. Table 5 also appears to be positively correlated with Table 7 where

respondents see the benefits on e-learning in terms of time and cost savings.

Other Responses

87% of respondents believed that employees had the skills necessary to effectively use e-learning

Table 7- Benefits of incorporate e-learning into the workplace

| | | |
|--------------|----|-----|
| Time Savings | 43 | 68% |
| Cost Savings | 20 | 32% |

Table 8- Resource constraints on e-learning (n=63)

| | | |
|------------------------------------|----|-----|
| IT resources | 22 | 35% |
| Financial resources | 23 | 37% |
| Technical proficiency of trainers | 8 | 13% |
| Technical proficiency of employees | 10 | 16% |

Table 8 appears to confirm the issue of resource deprivation where 78% of the respondents reported that their major constraints on e-learning were IT or financial resources. Since many e-learning technologies can be relatively inexpensive, the issue of financial resource deprivation also may support its potential use in the organization. The largest constraint (35%) indicated by respondents was IT resources, which may be a factor of company size since 56% of respondents were from smaller companies.

Table 9- Size of Companies represented by respondents (n=64)

| | | |
|-------------|----|-----|
| 1-100 | 36 | 56% |
| 100-500 | 21 | 33% |
| 500 or more | 7 | 11% |

Table 10- Industries of companies included in survey (n=63)

| | | |
|--|----|-----|
| Retail | 6 | 10% |
| Healthcare | 5 | 8% |
| Banking and Finance | 8 | 13% |
| Technology (hardware, software, web development, etc...) | 2 | 3% |
| Manufacturing | 6 | 10% |
| Construction | 2 | 3% |
| Education | 5 | 8% |
| Other | 29 | 46% |

The data within table 9 and 10 are purely descriptive to get a sense of what types of companies responded to the

survey and the size of those companies. The correlation cross tabs analysis of company size verses the other responses did not result in any significant differences. Similarly, the correlation analysis of industry type verses the different responses did not produce any significant differences. However, that is not surprising given the small sample size of 65 respondents.

Limitations and Future Research

This represented a first exploratory study to examine perceptions of e-learning in the workplace. Because the sample size was small, we cannot draw any generalizable conclusions. Therefore, future research should examine perceptions of specific e-learning technologies in the workplace using a much larger sample size within the specified industries and within organizations of specific sizes. This study also did not specifically address the adoption and diffusion of these new technologies into the e-learning practices of these organizations. However, future studies could examine these factors in conjunction with established models such as TAM. Finally, we did not address the issues associated with effective learning and e-curriculum development to make these different e-learning methods meaningful and valuable to organizations. Therefore, this represents another potential research stream.

Conclusions and Recommendations

It is clear that the expectations for workplace learning has changed and that employees as well as management are looking towards new, next generation technologies to fulfill their training needs. The major reasons for this shift include fewer employees who cannot spare the time for traditional courses, the need to justify and measure training with specific expertise requirements and fulfillment of company goals, and the huge reduction in costs of e-training compared with traditional educational delivery. Management additionally needs to find and develop new ways to train employees who are increasingly more and more technologically literate using mediums that these employees are familiar with such as the Web 2.0 technologies of Facebook™ and Twitter™.

An interesting finding from this study was the apparent lack of awareness of the newer technologies discussed among the respondents. The data shows that most respondents were familiar with older, traditional training methods such as live classes and asynchronous methods like online content, online videos, etc. However, they did not seem to know about newer technologies such as Second Life, social networking tools, games, simulations, or newer telepresence technologies. Therefore, perhaps the most compelling finding from this study is the needs for organizations to learn about these new tools which have the potential to cost effectively provide the training needed in innovative ways.

We suggest that the e-learning models and technologies presented provide the flexibility for organizations to fulfill their learning needs and offer several areas of research that the study of e-learning in the workplace could investigate to further our understanding of e-learning effectiveness and the factors that ensure greater retention in skills training.

In conclusion, we believe that e-learning in the workplace does represent a crucial means of helping organizations remain competitive. However, as discussed in the literature review, organizations need to do their homework on the technologies available as well as the factors that will facilitate adoption and diffusion of these tools

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