LEARNER SUPPORT REQUIREMENTS FOR ONLINE WORKPLACE TRAINING IN THE SOUTH AFRICAN FURNITURE INDUSTRY

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ABSTRACT

A qualitative research project was conducted to evaluate the suitability of e-learning as a means of delivering training to workplace learners in the South African furniture manufacturing sector. Twenty learners participated in a three-month pilot e-learning course and were monitored throughout. While the study was designed primarily to investigate the effectiveness of various pedagogical techniques in a South African context, the importance of providing adequate support to learners emerged as a critical theme during the research project, and this is the subject of this article. Issues included: poor awareness among learners' superiors, IT staff, and financial managers about the e-learning activities that their employees were involved in; sensitivity about costs incurred by employees in connecting to the Internet; a 'hands-off' attitude to online training by human resources staff; and a failure in many cases to set aside adequate study hours for employees. Recommendations for companies undertaking training via e-learning include: performing a cost-benefit analysis of face-to-face versus online training; facilitating clear and timely communication within the organization regarding e-learning activities; and establishing a study plan for each learner with the active involvement of learners' supervisors, IT support specialists, human resources staff, and financial managers.

KEYWORDS

E-learning, learner support, workplace learners, corporate training, online training

I. INTRODUCTION AND BACKGROUND

The forest products industry in South Africa offers an opportunity to address poverty and high unemployment by increasing the domestic production of value-added wood products such as furniture and joinery. A major barrier to achieving such growth, however, is a lack of appropriate skills; South Africa's Forest Industry Education and Training Authority states that "78% of the forest industry workforce is either semi- or unskilled, and there are critical shortages of craft or skilled workers, technicians, and professional managers" [1]. Post-secondary and tertiary education programs on wood products manufacturing are being developed in response to this problem, and e-learning is being considered as a delivery mode for industry training programs because it allows for flexible study schedules and eliminates the need for employees to leave the workplace and incur costly travel expenses. South Africa's Internet infrastructure-–although poor compared to that of western industrialized nations-–is well-established in African terms [2].

E-learning courses on forestry for undergraduate learners have been run by the University of Stellenbosch and Nelson Mandela Metropolitan University, South Africa, and students have responded favorably to the e-learning format [3]. The results suggest that e-learning may also be an appropriate format for corporate workplace training, which has prompted the present study.

Using a qualitative approach, this research project followed learners through a three-month online training course offered by the University of British Columbia that utilized a variety of pedagogical approaches and learning activities. Learners were interviewed in detail before and after the course, and WebCT server logs, discussion fora and email communications were monitored throughout the course.

It should be noted that the original focus of this research was on understanding the effectiveness of various pedagogical techniques for online workplace training. During the course of the research, however, it became apparent that learner support – one of the secondary topics of investigation– was also critical to learners' success. This view is widely held in the literature on workplace training. For instance, research has found positive correlations between the support of superiors and successful transfer of learning in the workplace [4, 5]. Several writers have noted the importance of senior management support for e-learning initiatives [6, 7], and the need for e-learning to be seen as more than simply a human resources-related activity [8]. The literature has also highlighted the need to carefully plan IT infrastructure and thoroughly test the technical aspects of e-learning training courses prior to launch [7, 9, 10]. Finally, researchers have found that learners may face difficulties due to the need for high levels of self-motivation and self-organization [11, 12, 3, 14]. Examples illustrating all of these issues emerged during the study, and will be discussed in more detail below, with some recommendations on ways that companies can address them.

II. RESEARCH METHODS

The qualitative case study approach utilized in this study allowed for detailed information to be collected via a flexible, semi-structured interview format, and also enabled complex interactional variables that typically take place in learning environments to be taken into account [13]. A quantitative study of learners enrolled in several courses was deemed inappropriate because the teaching and learning methods employed in the various courses would not be uniform and it would be impossible, in practical terms, to ensure that consistent approaches were being used across all courses. Consequently, a specific e-learning course was adapted as the focus of the study, so that the researcher was able to control and manipulate all of the key variables related to course design, including the content, types of learning activities, presentation, assessment criteria, student workload, and timing.

The course chosen was a web-based, first-year undergraduate course, developed at the Faculty of Forestry, University of British Columbia, that was intended to introduce students to what is known as the forest products value chain, beginning with the planting and management of forests, and encompassing all of the key manufacturing stages and the various issues and interrelationships along the supply chain through to the global trade in forest products. It is presented within the WebCT course management system. To prepare for the research study, the course content was substantially adapted and augmented so that it was relevant to South African participants, and a pedagogical redesign was undertaken to ensure that a wide variety of teaching and learning activities were included. (For a more detailed explanation of the pedagogical redesign of the course, the reader is directed to]).

The course was designed so as to avoid media or applications that required high bandwidth (video, animated simulations, audio) as it was anticipated that this could cause accessibility problems for some learners due to slow modem connections and poor bandwidth. Content was presented chiefly through text-based HTML pages supported by photographs, diagrams, and charts, and supplementary readings were made available in Adobe PDF document format and optimized such that the file size was as small as possible.

III. SELECTION OF STUDY PARTICIPANTS

Twenty workplace learners were selected to participate in the course. This sample size was small enough

to allow for detailed, one-on-one interviews to be conducted with each participant, yet still yielded a varied range of opinions and perspectives. It was deemed important to minimize variation with respect to access to technology and corporate policies towards training and, for this reason, all of the learners were selected from one large, diversified company. The company chosen was Steinhoff Africa Group Services Ltd., the largest employer in South Africa's furniture sector, with over 30 manufacturing facilities dispersed throughout South Africa and many more located elsewhere in Southern Africa, Europe, and Australia. The company's International Human Resources Manager, Johan Geldenhuys, stated that Steinhoff was interested in evaluating the potential use of e-learning as a training tool because of the challenge of providing standardized training across multiple sites and in many different countries.

Candidates were recruited on a voluntary basis with the assistance of human resources managers, but were required to be working in roles in which the course subject matter would be relevant and beneficial, and to have access to and some experience in using a computer. The participants were employed in eight manufacturing facilities located close to the three major urban centres of South Africa (Johannesburg, Cape Town and Durban). Table 1 shows age, gender, educational history and occupation information for the learners who participated in the study.

Learner	Age	Gender	Highest Level of Education	Occupation
1	35	Male	B.Sc.	Production Director
2	45	Female	3-year Technical Diploma	Nesting Manager
3	29	Female	Part-time technical college courses	Covers Controller
4	42	Male	Part-time technical college courses	Factory Production Manager
5	38	Male	3-year Technical Diploma	Logistics Manager
6	23	Male	3-year Technical Diploma	Training Manager
7	25	Male	3-year Technical Diploma	Management Trainee
8	25	Male	Part-time technical college courses	Production Planning Supervisor
9	24	Male	3-year Technical Diploma	Logistic Planner
10	29	Male	B.Sc.	Production Trainee
11	35	Female	B.Sc.	Product Development Manager
12	39	Male	Part-time technical college courses	Production Manager
13	32	Male	Part-time technical college courses	National Quality Assurance Manager
14	26	Male	Part-time technical college courses	Production Planner
15	26	Male	Part-time technical college courses	Line Manager
16	37	Male	Part-time technical college courses	Line Manager

17	**30**	**Male**	**3-year Technical Diploma**	**Production Planning Manager**
18	**25**	**Male**	**3-year Technical Diploma**	**Production Planner**
19	**23**	**Male**	**3-year Technical Diploma**	**Management Trainee**
20	**25**	**Male**	**3-year Technical Diploma**	**Management Trainee**

Table 1: Learner Profiles

IV. DATA COLLECTION

Interviews were conducted with each of the learners at their workplaces in June 2005, approximately three weeks before the start of the course. These interviews were designed to obtain a detailed profile of the learner group in terms of educational and career histories, personalities, experiences with computers and the Internet, and attitudes and beliefs about teaching and learning. A second set of interviews were held in October 2005, immediately following the conclusion of the e-learning course. The aim of the exit interviews was to obtain detailed qualitative data on the appropriateness of the various learning activities, and to probe issues related to learner support that had arisen during the course. Eight human resources and training managers from the various factory locations were also interviewed at this time. It is primarily this secondary set of interviews which forms the basis of this paper. WebCT server logs, quiz scores, emails to tutors, and grades for other assessed activities were monitored by the researcher throughout the course, but are not explicitly reported on here. Grading of participants' assessed work was done by other faculty members at the University of British Columbia and the University of Stellenbosch to ensure impartiality.

V. RESEARCH FINDINGS

As noted above, the original focus of this study was on the identification of appropriate pedagogical techniques for workplace training via e-learning in South Africa's furniture industry. During the study, it became apparent that support in various forms from within the organization was a critical factor affecting the success or failure of each participant's learning experience. Similarly, some corporate policies were seen to have had strong, but unforeseen, impacts on learners' performance in the course. This article focuses on these aspects of the research findings, which are presented in this section. A series of recommendations are subsequently proposed in the following section as a means of creating optimal conditions for the success of e-learning within South African manufacturing organizations.

A. Motivation, self-directed learning, and corporate training culture

Learners identified a number of factors that influenced their motivation during the course, some of which were personal and others externally-influenced. At a fundamental level, the relevance of the course content to one's own job was an important aspect and, as may be expected, those working more directly with wood products and materials generally appeared to be more motivated by the course content itself than others. Technical and infrastructure support also had a strong influence on learner motivation. Ten of the 20 learners experienced problems at the beginning of the course because they did not have timely access to a computer, did not have adequate email or Internet access, or had technical problems with their computer user account that resulted in a communication breakdown. In most cases, this resulted in delays in starting the course, which negatively affected learners' motivation since they then had to work even harder to catch up. In three such cases, learners repeatedly asked colleagues or superiors for assistance in solving these issues

and, when their requests were not addressed, they ultimately lost interest and dropped out of the course. One such learner, describing a problem he had in gaining access to his own company Internet network, stated, "a big problem was that I was out of the loop – I asked the IT people to have a look at it, and to please delete and recreate my profile. HR were aware of it too. Nothing happened, and I gave up trying to get the problem solved after a while."

Five respondents stated that the existence or absence of visible buy-in from managers and direct superiors directly affected their motivation to successfully complete the course. Similar findings have been reported by [6], who stress the importance of securing senior management support for e-learning initiatives, and by [8], who suggests that e-learning is seen as a human resources issue only, but has not yet become part of the mainstream HR lexicon. A study on learning transfer in workplace training by [4] found that "ensuring a supportive work climate may be the single most important requirement for the successful transfer of learning." A similar study of motivation to transfer knowledge gained in computer-based training by [5] showed that organizational commitment and supervisor support had positive effects on the perceived transfer of training, and were correlated with both a motivation to transfer knowledge acquired and to use it in the workplace.

In the majority of cases during the Steinhoff study, buy-in from superiors was not present, because most of the learners' managers were either not informed about the study or received minimal information. Eight of the learners took the initiative to periodically update their superiors on their progress, or requested intervention to solve problems such as delays in getting Internet access. It would appear that better communication of training goals and learner requirements (access to computers and Internet, release time to study) to the learners' managers may increase the likelihood that the managers would support learners' efforts. Generally speaking, inter-organizational communication during the e-learning pilot program appeared to be inadequate. One learner suggested that, "checks should have been done with us as to our progress in the course. If we were falling behind we could have negotiated for study time during the day."

Three of the five human resource managers who were interviewed expressed the view that e-learning requires high levels of self-motivation and commitment, and this is supported in the literature [11,12]. Interviews and course results revealed that individuals who appeared to be highly self-motivated in other aspects of their careers and personal lives tended to be more successful at completing course requirements on time. Accordingly, the learners who performed best in the course in terms of timely submission of quizzes and assignments described themselves as "strongly self-motivated."

In a study of undergraduate e-learners in South Africa, [3] found that "students are often not used to self-organized learning." This is likely to be the case also for workplace learners who are more accustomed to expository styles of teaching (such as classroom-based lectures) than learner-centered approaches. Two of the human resources managers interviewed suggested that most of their employees were not sufficiently self-directed to take part successfully in training via e-learning, and one went further, stating that the company "does not possess a learning culture." Although it was beyond the scope of this study to evaluate such opinions, careful instructional design coupled with the provision of adequate support for learners from within the organization may help to maximize learners' motivation and encourage their full and active participation in e-learning programs.

B. Communication within the organization

Awareness of the e-learning program and its potential benefits among relevant individuals throughout the organization seemed be key to the success of the course. Participants suggested that many people within the organization should have been well-informed about the e-learning course, including: human resources man-

agers at the corporate, regional, and factory levels; the direct superiors of learners; and information technology (IT) personnel and those responsible for reviewing and authorizing Internet access privileges and assigning computers. In order for these personnel to be of assistance to learners, they must first be provided with detailed information about: the rationale for such training; the requirements in terms of study time, computer, and Internet access; the duration of the course; and the benefits to the company and individual departments of the employees' participation in the e-learning program. It was evident during the study that this information was not communicated adequately to these stakeholders, resulting in a variety of outcomes that negatively affected participants' learning experiences and motivation. One participant stated that "if HR could have brought across the importance of this course to our factory managers it would have helped a lot - they didn't see it as important. I was told to "leave it" by my managers when I was studying if any problems came up that needed my attention."

C. Cost considerations

The costs of Internet connectivity appeared to be a sensitive issue within the various company units involved in the study. It is standard practice within the participating companies for Internet usage by each employee to be tracked and recorded. Twelve of the 20 participants in the e-learning study stated that they were very conscious of the need to minimize connection times to the Internet because financial administrators would view such activity as wasteful and excessive. A factory Human Resources Manager illustrated this point with the comment "Internet access in the company is assessed by financial controllers and monitored on a per-megabyte-downloaded basis. That makes us rush, knowing learners will be quizzed afterwards by bosses on why they spent time online."

Learners also stated that, from their perspective, applying for Internet access was a slow and bureaucratic process that involved obtaining authorization from senior financial staff and from corporate headquarters. Learners and human resources managers alike expressed the view that Internet access was a privilege that only senior managers were afforded, due to concerns about misuse. This resulted in learners visiting the course web site less frequently than they might otherwise have done, which negatively affected the level of interactivity between participants and tutors involved in the course.

D. Study schedules

Formal recognition of the time needed to participate successfully in e-learning courses appears to be critical. Prior to the course, 15 of the 20 participants stated that they expected to fit most of their e-learning studies into their work day, as few had adequate computing facilities at home. In reality, however, they found that setting aside sufficient time at work to fulfill the requirements of the course was very difficult, and that this was compounded by the fact that their superiors expected them to be available for normal duties as usual throughout the day. E-learning had become "invisible training," with a requirement on the part of learners to devote time to the course, but no acknowledgement of that need by others within the organization.

VI. RECOMMENDATIONS

Based on the findings presented above, four recommendations for ensuring the success of workplace e-learning are made. Each is discussed in turn in this section.

A. Recommendation 1: Cost analyses

Prior to running e-learning courses, it is recommended that human resources/training managers should conduct a comparative cost analysis of face-to-face versus online training. The analysis should consider

tuition costs, travel costs to the facility where face-to-face instruction is to occur, the cost of course texts and other materials, and lost productivity due to time that employees spend away from the workplace. It is anticipated that, through such an objective analysis, the costs of Internet connectivity will be shown to be relatively small compared to the potential savings. The training manager or human resources manager will then be able to make a convincing, financially-based case to relevant financial and IT staff for learners to be granted adequate access time to the Internet.

B. Recommendation 2: Improved communication

The importance of adequately informing and involving relevant personnel at all levels of the company about e-learning initiatives cannot be understated, and this is reflected in best-practices literature such as [14], which suggests practitioners should "sell e-learning to everyone in the organization. E-learning must be perceived by senior management as a key function within the company in order that sufficient financial and IT resources can be dedicated to it [15] and "effective corporate leadership is needed to promote the delivery of relevant knowledge and skills" [16]. Recommendations regarding ways to create the necessary internal communication are presented below.

Human resource/training managers: Human resources (HR) managers must be fully informed about e-learning courses and provide the necessary support and logistical coordination to maintain learner motivation and ensure that the required technical infrastructure is in place. Human resources managers at the factory locations are the primary contacts for the learners, and they facilitate the learners' participation in e-learning courses. Before the e-learning course begins, it is very important for HR managers to liaise with information technology personnel to ensure that the learner will have a computer available, an email account and Internet account set up, and the necessary software installed on his/her computer. This should be done in advance of the course so that the learner is afforded time to test the system and have any problems addressed. The IT specialist should be informed of the duration of the course, and asked to perform a supporting role, so that the learners receive any necessary technical assistance during the course as problems arise.

The HR manager should also discuss the e-learning course with the financial administrator in charge of securing Internet access privileges for members of staff. Financial managers should be made aware of the goals of the e-learning course and the recommended amount of time that learners are expected to spend online. The cost analysis described above should be presented and discussed to illustrate the cost savings that will offset the increased expenditure on Internet access. These actions should help to ensure that learners do not minimize the time spent online at the expense of their studies.

The HR manager can also act as a training advocate for learners, to ensure that supervisors and superiors understand the importance of the e-learning program and allow learners sufficient time in their work day to complete course requirements. It is recommended that, prior to the start of the course, the learner, his/her HR manager, and immediate supervisor should meet and set up a study schedule for the course (see below). It is anticipated that this will create buy-in among the three parties, and reduce the risk that training time will be subsumed by other workplace commitments.

The study outcomes suggest that much closer supervision of the learner is required for e-learning to be successful. If the e-learning course provider is located remotely from the learners (as was the case in this study), the company's human resources managers should act as a point of contact and source of support for learners. Study results suggest that monitoring mechanisms should be set up which allow HR managers to inquire about learners' progress and suggest corrective action should they fall behind with their studies or perform below expectations. This corrective action may include liaising with learners' supervisors/superiors to negotiate more time for their studies.

Immediate superiors: Most learners' superiors knew very little about the e-learning course that their employees were involved in. As a result, most learners had the impressions that their superiors did not place very much importance on the e-learning program. Learners stated that this negatively affected their performance in the course in two ways. Firstly, it was difficult for most learners to take time away from workplace duties to log onto the course website. Secondly, and perhaps more importantly, many learners felt that, had their superiors actively encouraged and supported them in their studies, they would have been more motivated to complete the course requirements despite busy work schedules. It is recommended that learners and their superiors create a study plan prior to the course that takes into consideration the learners' workloads and responsibilities (see below). The need to convince senior management of the importance of e-learning initiatives has also been highlighted by [7], who reported that e-learning implementation requires significant planning, and attention must be paid in particular to IT infrastructure and change management. Similarly, [17] suggests that a prerequisite for a healthy workplace learning environment is that management must be aware of the need for learning at all levels and middle managers should be trained to foster and develop learning.

Financial administrators: As discussed above, financial administrators should be made aware of the rationale for the e-learning program and any cost savings that will offset the increased Internet usage. They should also sign off on the study plan created by the learner and his/her superiors so that the learner is aware that adequate Internet connectivity time has been officially authorized.

IT staff: Research by [9,10] found that if technology does not work properly then learners will quickly become frustrated and may quit, a scenario that was witnessed in this case study. A key role of IT specialists is to set up technical infrastructure for the course in a timely manner and to quickly resolve technical issues that may confront learners. To do this, IT personnel must be made aware of the detailed technical requirements of the e-learning course. These include: minimum acceptable hardware specifications; the types of software that must be installed on learners' computers; the URLs of course web sites; any minimum bandwidth requirements; the kinds of media that will be used; and how any security arrangements or firewalls that have been put in place within the company might affect access to the course website or other external websites.

Human resource managers should meet with IT staff well in advance of the course start date to pass on this information. IT staff should be made aware of the importance of the course so that if problems do arise, they are given sufficient priority and are dealt with quickly.

Learners: It is important to note that adequate and timely communication is not merely the responsibility of management. For e-learning efforts to be successful, learners should immediately advise course tutors and human resources staff of any circumstances that are preventing them from completing course requirements on time. These circumstances may include: technical difficulties with email, Internet, or network access; sudden fluctuations or unforeseen changes in workload; family and personal commitments; difficulties with navigating the course website and using the various tools; or uncertainties about course requirements or assignments. Course tutors and human resource managers must stress to learners the importance of communicating these kinds of problems as soon as they occur, to avoid learners falling behind and experiencing more serious problems.

C. Recommendation 3: Study plans

Learners should be required to create a formal study plan prior to commencing any e-learning course. The plan should be drafted in consultation with human resources staff and the learners' direct superiors, and should be reviewed and approved by financial managers and IT staff. The plan should set aside specific times in which learners can carry out their studies during normal working hours, and should identify techni-

cal requirements in terms of computer and network infrastructure and Internet connectivity. This approach has several advantages. Direct superiors will know in advance that learners will be unavailable for normal duties at certain times due to training commitments. This will create a similar situation to one in which the employee is physically absent from the workplace while taking part in a face-to-face training workshop. The supervisor/manager should also be made aware of the additional workload that the employee has taken on due to training commitments so that he/she can take this into account when assigning tasks. This should result in a more manageable workload for the learner during the e-learning training period, which will assist him/her to complete course requirements on time. A study plan of this kind will also allow supervisors to plan production activities and assign tasks in such a way that negative impacts on employee productivity due to the e-learning course are minimized. Managers should also inform co-workers of the training schedule so that learners can be left uninterrupted during e-learning sessions.

From the employee's point of view, the study plan commits the learner to studying at specific times of the day and instills in the learner the knowledge that his/her superior is aware of this commitment. It is likely that, having conceded a number of production hours to training, the manager will play a more active role in monitoring the employee's progress in the course. This may encourage the learner to pay attention to course deadlines, and alleviate the tendency to procrastinate.

Although the adoption of a study plan is likely to yield many of the aforementioned benefits, it is acknowledged that the day-to-day responsibilities of many employees involved in production activities can be extremely unpredictable. As such, the study plan cannot be expected to completely mitigate fluctuations in study time due to changing work pressures.

D. Recommendation 4: Scheduling

When planning training programs of any kind in a workplace setting, seasonal fluctuations in working hours should be taken into account. For instance, all of the learners stated that within the South African furniture industry, the July to December period is much busier than the January to June period. Consequently, it is recommended that e-learning courses of a similar length or greater than the one employed in this study should be scheduled during the first half of the calendar year.

VII. CONCLUSIONS

Support for e-learning activities from within the employing organization was found to be a critical factor affecting the success of such training activities and, without such support, web-based e-learning cannot be recommended as a training tool. In the Steinhoff Africa case, participants were expected to learn independently without the active involvement of managers or colleagues. As a result, many learners experienced IT problems that remained unaddressed, felt isolated, and/or generally became less motivated. Human resource and training managers must play a coordinating role in e-learning initiatives, bringing together learners' superiors, IT support, and financial staff to ensure that learners have the highest possible chance of success.

The Internet infrastructure in place at the factory locations was found to be adequate to allow learners to participate fully in the e-learning course, although some participants found download speeds to be slow at times. The e-learning course used in the study did not include media or applications that required high bandwidth, however, and care should be taken to ensure that courses designed for South African workplace learners adopt a similar approach. The falling costs of Internet service in South Africa can be expected to improve average bandwidth and connection speeds in the near future, enabling e-learning to be utilized

even more widely and for courses to be enriched through greater use of multimedia.

The results of this study suggest that South African furniture industry employees who are regular users of computers are appropriate candidates for participation in well-designed web-based training programs, if adequate levels of support are provided from within the organization and candidates have a strong interest and motivation to complete such programs.

VIII. STUDY LIMITATIONS

This study is limited by a number of factors. The qualitative approach used is an appropriate means of collecting detailed information on learner attitudes and experiences, but the small sample size means that the results cannot be considered to be statistically significant. For this reason, judgments about the usefulness and credibility of the results must be left to individual interpretation [18].

A limitation of the pilot e-learning course itself is that it was not feasible within the research project timeframe to apply for and obtain official accreditation from the South African Ministry of Education. This factor may have resulted in lower levels of learner motivation than if the course had been accredited. A further limitation was the absence of financial incentives for learners to complete the course. The Steinhoff Group typically bears the costs of employees' training through a variety of arrangements, but all of these are contingent upon successful course completion. Some of the human resources managers interviewed suggested that learners would have had greater motivation to complete the course had such financial risk existed.

IX. SUGGESTED FURTHER RESEARCH

This study has identified the importance of intra-organizational support for employees in the South African furniture industry who are involved in training via e-learning. Support is a critical success factor common to any industry sector. It is recommended that the relevance of organizational support for e-learning be investigated using large-scale quantitative research methods to survey a variety of organizations in various industry sectors involved in corporate e-learning.

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