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Perceptions of E-Learning in Organizations: An Empirical Study on the Effects of Gender Age, Duration of Employment, and Managerial Level

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PERCEPTIONS OF E-LEARNING IN ORGANIZATIONS: AN EMPIRICAL STUDY ON THE EFFECTS OF GENDER AGE, DURATION OF EMPLOYMENT, AND MANAGERIAL LEVEL

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Abstract

The e-learning industry is predicted by Gartner Group to grow to $33.4 billion by 2005 indicating a phenomenal expansion of market size - almost 16 times its current state. The research results reported here are based on a major study involving over 370 e-learners within a large telecommunications company in Australia.

Analysis indicates that staff do not prefer e-learning over its traditional face-to-face counterpart and that this is primarily driven by the perception that the disadvantages outweigh the advantages. This research also explores the effect of demographic characteristics on an individual's preference for e-learning and finds that each of gender, age, time in the workplace and managerial status has an effect on the way it is perceived. The paper concludes by suggesting that the introduction of e-learning into the corporate environment maybe more difficult than short-term cost savings might suggest. It also suggests that management will need to carefully consider the different groups being offered e-learning and tailor the courses with individual characteristics in mind.

Keywords: Online learning, organisational learning, online training, e-learning

Introduction

The Commission on Technology and Adult Learning (2001) echoes the Gartner Group's forecast of a growth of up to $33.4 billion and stated a need to "establish public-private partnerships to conduct research and development on how adults learn and how to measure learning".

This research study is aligned with this global objective and endeavors to provide management and education providers with an understanding of the factors that influence an individual's preference to e-learn.

Background

Online Learning is an extension of distributed and computer based learning, using all digital technologies to provide anytime, anywhere training, enabled through the Internet. (Volery and Lord, 2000). The delivery method can be synchronous or asynchronous and the technology provides students with access to learning resources, administrative support, collaboration functionality and assessment. These assessments often take the form of simulations or self-administered quizzes where the interaction is primarily with the computer and not the instructor.

E-learning can be considered as a subset of distributed learning, whereby instructional digital content is delivered to students though a network enabled electronic technology interface. (Tanquist, 2000; Pantazis, 2002; Harris et al. 2002; Lundy et al. 2002). For this research the following definition drawn from the above has been used:

> *"E-learning involves the asynchronous delivery of educational material to direct employees in a corporate environment enabled by network technology".*

From the organisation's perspective, cost issues play a major part. When comparing e-learning to traditional instructor led training, the latter is almost always less expensive to create, however the break-even point occurs faster for e-learning courses. (Bolan, 2001). Although the "cost savings are real and the benefits are quantifiable" (Pantazis, 2002), the strategic viability of e-learning is an amalgamation of "the need to validate outcomes directly with increased ROI, provide on-demand task related resources, rationalise duplicated training, reduce delivery costs and increase organisational efficiency". (McCrea et al. 2000). The general consensus in current literature is that e-learning is a "rapid, effective and less expensive form of training and development" (Schutte, 1996; Magalhaes and Schiel, 1999; Karon, 2000) than classroom instruction (Mottl, 2000). This might be expected to be particularly so in areas such as Information Technology where there is a continual need for updating of skills and a high staff turnover – as such a cost-effective set of courses appears considerably attractive.

While scalability is attractive to the organisation, the compelling feature of accessibility (Galagan, 2000) is suggested by the twin factors of convenience and flexibility (Emmons, 1999). As the average age of students undertaking e-learning is higher than the average 18-25 year old university student, they are less likely to put up with inconvenience. A study covering 4000 corporate e-learners found there was a general desire to improve the flexibility of where learning could take place – be it the home, office or remote locations (Kaplan-Leiserson, 2001). This enables not only better management of personal commitments but work duties too. Other benefits to the individual include the use of multimedia to enhance the overall learning experience through simulation (Inglis, 1999), to try out new concepts and fail in private without fear of ridicule from peers (Galagan, 2000), and providing students with the ability to track their professional development and learning requirements more easily (Landers and Lundy, 2002).

Less attractive features of e-learning include the absence of peer support and help from the instructor, unfamiliar technology and lack of feedback (Emmons 1999). It also requires the individual to possess the characteristics of being "self-regulating" (Emmons, 1999), self-disciplined, motivated and requiring less assistance. (Dick et al. 2002). Depending on the type of training, online education is sometimes seen to have the disadvantage of missing out on resources (Dick et al. 2001). In a corporate environment, the concern for this might be access to resources such as subject experts. Finally, one of the largest obstacles of distance education is community perception and general recognition. (Emmons, 1999) The negative connotations that surround distance learning are a result of poor quality correspondence schools. (Emmons, 1999) and may carry over to the corporate environment. "A Vision of E-learning for America's Workforce" attempts to combat these identified disadvantages (Commission on Technology and Adult Learning, 2000).

There is considerable evidence in the online learning and telecommuting literature that demographics play a part in their acceptance. A student's gender is expected to impact the effectiveness of online learning (Volery and Lord, 2000) and this is supported by research into the dominance of males in computer usage (Reinen and Plomp, 1993) and therefore computer experience (Kay, 1992). In a demographic study into an individual's preference to telecommute, it was found that woman rated the advantages of telecommuting higher than men both overall and in each occupation group. The authors cited family, personal benefits and stress reduction as the major rewards. (Mokhtarian et al. 1998). Online students tend to be older (Dutton et al. 2002), within the 35 – 64 age bracket (Kaplan-Leiserson, 2001) and therefore more mature and self disciplined. (Jasinski, 2002). Studies by Clark (1998), Belanager (1999) and Stanek and Mokhtarian (1996) all point to possible influences of time in the workplace and job title on the preference for telecommuting – again some carryover to e-learning might be expected.

The above gives rise to the following research questions:

1. Will staff prefer e-learning to face-to-face instruction and training in the corporate environment?
2. Will the preference differ depending on gender, age, time in the workplace and managerial status?

Will the reasons determining the preference differ depending on gender, age, time in the workplace and managerial status?

Methodology

The above literature was used as the basis for the construction of a survey instrument, which was pilot tested in the same organisation as that used for the main study. After validation, factor analysis was employed to reduce the length of the survey instrument. A modified instrument was developed and re-validated prior to administration for the main study. This instrument was administered to a randomly selected set of staff in the organisation. A copy of the questionnaire may be found as Appendix A.

Reliability of the instrument in terms of stability was measured by a test-retest procedure (all correlations were high and significant at the .001 level); construct validity was measured using Cronbach alpha scores to determine internal-consistency reliability. The concepts of advantages, disadvantages and availability of enablers achieved alpha values of .81, .79 and .81(all in the DeVellis (1991) "good" or "respectable" ranges). Validity of the measurement instrument was assessed in terms of content validity, (specifically including face validity and sampling validity), and construct validity. This methodology is in accordance with generally accepted procedure (Frankfort-Nachmias & Nachmias 1996). Specific procedures conducted to assess each of these for the current study were:

- Face validity (a necessarily subjective assessment of the instrument's appropriateness) was assessed and achieved by the researchers by basing the instrument on previously validated surveys and its evaluation by professional research staff in the organisation.
- Sampling validity (whether a given population is adequately sampled by the measuring instrument) was provided by the distribution of the survey to all randomly selected staff members. The high response rate goes some way to ensuring sampling validity too.
- Construct validity was assessed by means of Cronbach alpha scores.

External validity issues deserve special mention. It should be noted that there are some limitations to the generalisability of the conclusions that can be drawn from the results of the analysis of this data. The respondents were selected from one organisation and used a particular e-learning software package. They also used computing technology on a regular basis. Against this, they were randomly selected, represented a wide spectrum of the (large) business unit and provided a high response rate with no incentives offered.

In order to assess the effect of each of the independent variables on the preference for e-learning, non-parametric t-tests and step-wise linear regression was performed on the data.

The Data

The candidates selected to participate in the pilot study were from a large telecommunications provider in Australia. They were all staff from the Retail business unit representing many different divisions and came from a variety of training and educational backgrounds, with different levels of experience and positions. Some 753 forms were distributed with 374 returned, response rate of 49.7%. Of the participants, 45% were male, 55 % female, 73% were aged under 40, 56% had been with the organisation less than 10 years and 65% in their current position less than 3 years. 20% were managers, 80% non-managers.

Results

Overall the respondents expressed a "non-preference" for online learning – in general terms they believed that the disadvantages outweighed the advantages. On a five point scale where 1 indicated "strongly agree" and 5 "strongly disagree", in response to the statement "*I prefer online courses over traditional face-to-face training courses*" the sample as a whole produced a Mean of 3.81 with a Std. Dev. of 1.088. Although the size of the data sample was large, the data was generally not normally distributed; therefore in general non-parametric tests were used. Descriptive statistics are given in Appendix B.

Gender

The survey requested participants to rate the level of importance they associated with a series of advantages of e-learning identified in the literature. A series of Mann-Whitney tests, were used to assess the level of importance each gender placed on each particular perceived benefit of e-learning.

From this analysis, it would seem reasonable to conclude that both groups see the advantages and disadvantages in a similar light as differences were noted in only two of the factors. It was found that females find face-to-face training environments more intimidating than men. (Mann-Whitney $U=14405.500$ $p<.001$) This is aligned with women finding the style of online education provided by e-learning suits them more than men do. (M-W $U=14876.500$ $p<.05$) It may be that the men in the sample are more sociable, preferring the interaction that results from face-to-face learning environments.

A Mann-Whitney test was then used to determine whether men and women are equal in their preference for e-learning. It was found that the difference was significant (M-W U=14979.000 p< .05), indicating that although both genders prefer face-to-face training courses to their online equivalents, women tended to be less opposed than men. Figure 1 displays the difference (5 = strongly disagree).

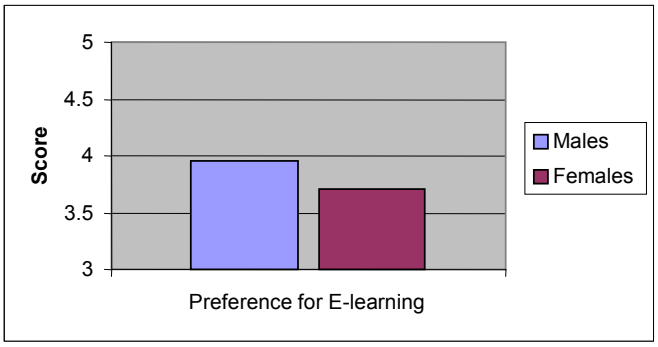

Figure 1. Preference for E-Learning

Therefore, it can be seen that although the difference in preference for e-learning is relatively small between men and women, it is statistically significant.

Turning now to the reasons for the non-preference for e-learning, regression analysis indicated that although the factors are quite similar, women tend to appreciate the ability to train without the intimidation of other staff, while men are more focused on the attributes of the learning style. These learning style factors had both positive and negative effects on their preference. For example, men prioritised the suitability of the delivery method to their own way of learning; however, their more negative attitude towards e-learning was attributable to the fact that they believed they learnt more from face-to-face training.

In summary, the results indicated that while both groups view the advantages and disadvantages in a similar light and both groups would prefer face-to-face learning, women are less opposed than men. Also, males and females have different reasons for the e-learning non-preference

Age

When a series of Pearson Chi-Squared tests was conducted to determine the significance of the differences, it was found that age had little effect on an individual's preference for e-learning (c^2= 11.626 df= 10 p=.311). It can therefore be concluded that preference for e-learning is not affected by age.

Step-wise regression analyses were conducted to ascertain which factors affected the non-preference for e-learning. The results are given in the tables 1 and 2.

Although some of the individual R^2 scores are low, they have been included here (and in subsequent results) for completeness. The overall R^2 values are considered high for this type of research. The above indicates that although age group does not affect the preference for e-learning, the factors influencing the preference are very different.

Employment

Pearson Chi-Squared tests indicated that the duration of employment does not affect an individual's preference to e-learn (c^2=9.216 df=15 p=.866). However, it was found that the preference for e-learning was affected by an employee's duration in his/her current position. (c^2=39.105 df=25 p<.05). Independent sample t-tests revealed that employees in the same position for a shorter period preferred e-learning (Mean=3.77) more than staff who had been in the same position for a longer period (Mean=3.94).

Table 1. People Under 40 Years of Age

	Adjusted R Square Change	Standard Coefficient
Generally, online training courses are more respected than face-to-face training	0.337	.217
I am able to get more help on difficult subject matter in a classroom environment than on E-learn	0.177	-.224
Personal reasons such as flexibility and independence of work makes online learning attractive to me	0.057	.162
I learn less from online courses than I would if I was in a traditional face-to-face learning environment	0.027	-.172
I find face-to-face training environments intimidating or undesirable	0.024	.204
I would encourage most professionals to participate in E-learn type systems	0.023	.175
I would typically rather work on my own, than with other staff	0.006	.092
R^2	**0.651**	

Table 2. People Over 40 Years of Age

	Adjusted R Square Change	Standard Coefficient
The style of learning provided by online education suits me	0.389	.232
I learn less from online courses than I would if I was in a traditional face-to-face learning environment	0.072	-.188
I find face-to-face training environments intimidating or undesirable	0.038	.185
I would encourage most professionals to participate in E-learn type systems	0.029	.244
Generally, online training courses are more respected than face-to-face training	0.015	.196
I frequently experience technical difficulties that I need to solve when using E-learn	0.013	-.177
I believe there is sufficient technical support to utilise E-learn effectively	0.008	-.143
R^2	0.564	

Once again, regression analysis indicated that the reasons affecting the non-preference were different. People employed less than 10 years placed importance on the suitability of the e-learning style to their own, the intimidation caused by face-to-face training and the quantity of learning achieved (R^2=.523). Employees who had worked for the telecommunication company for more than 10 years were driven by factors such as mandatory participation, the ability to get assistance more easily in a classroom and the respectability of e-learning courses (R^2=.568). Therefore, longer serving employees appear to place more emphasis on the outcome of the learning experience, such as its respectability, rather than the experience itself.

Likewise, staff serving in the same position for 3 or less years were concerned with the amount of information learnt, the respectability of the course and the ability to get additional assistance if required (R^2=0.607). Analysis of staff serving in the same position for more than 3 years revealed similar factors, although the priorities were different. They too, considered the respectability of the course and the quality of the training; however, they also appreciated the benefits of being able to manage their own work commitments (R^2=0.694).

Managerial Status

Managers are less opposed to e-learning than non-managers (M-W U=8322.500 p=.000). This is reflected in Figure 2 (again, 5= strongly disagree).

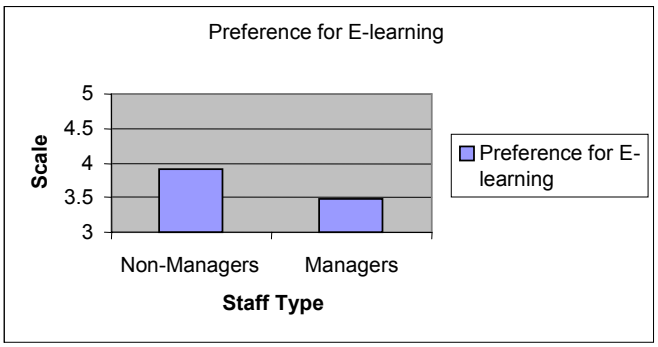

Figure 2. Preference for E-Learning by Staff Status

Regression analysis indicated that each group had differing influential factors contributing to their overall preference for e-learning. Managers' overall perceptions of e-learning were influenced by the suitability of the e-learning style to their own personal learning style, the respectability of the course and the belief that e-learning offered a diminished training experience (R^2 =.406). Non-managers' dislike for e-learning was motivated by 11 contributing factors, (R^2 =.650), of which the strongest included the belief that face-to-face learning taught more content. Therefore it can been seen that not only is there a statistically significant difference in the preference for e-learning, based on an individual's position as a manager, but also in the factors that motivate each group.

Conclusions and Further Research

The respondents in this study indicated that e-learning was generally not the preferred option. This (non) preference varied depending on gender, time in the current position and managerial status. While the literature suggested age would have an effect on the preference for e-learning, this research has revealed a contradictory finding. The reasons driving the (non) preference were different, depending on gender, age, time in the workplace and managerial status.

The results from this study have indicated that while there are not great differences in the (non) preference for e-learning, there are potentially important variations in the way it is perceived and the reasons driving those perceptions. These differences indicate that different groups will accept or reject this alternative form of training or education based on a particular set of circumstances that apply to them. It also indicates that in order for e-learning to have a chance of being successfully implemented and used, management will need to carefully consider the characteristics of the groups and individuals and tailor the courses and the way they are presented, accordingly.

This would suggest that e-learning is no panacea. In order for it to stand any chance of acceptance, management may need to give serious consideration to the potential e-learning body and tailor the offerings accordingly. The short-term attractiveness of cost savings and the apparent cost-effective nature of such courses may very well be outweighed in the longer term by reduction in staff morale and the resultant staff turnover.

There are limitations to this study – it sampled staff in only one organisation and in one country, using one particular e-learning software package. Further work needs to be done on other organisations, in other countries and using different learning systems.

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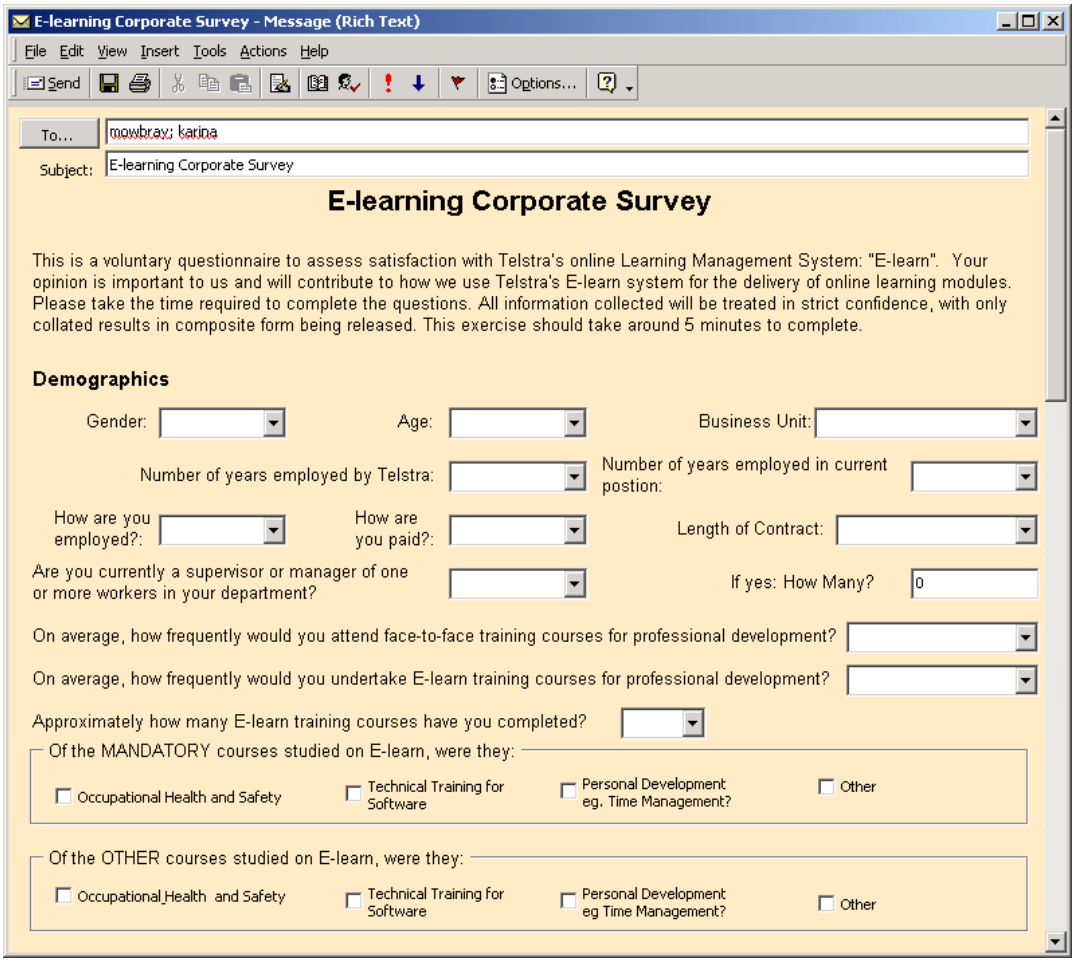
Appendix A



E-learning Corporate Survey - Message (Rich Text)

File Edit View Insert Tools Actions Help

Send Options...

To... mowbray; karina

Subject: E-learning Corporate Survey

E-learning Corporate Survey

This is a voluntary questionnaire to assess satisfaction with Telstra's online Learning Management System: "E-learn". Your opinion is important to us and will contribute to how we use Telstra's E-learn system for the delivery of online learning modules. Please take the time required to complete the questions. All information collected will be treated in strict confidence, with only collated results in composite form being released. This exercise should take around 5 minutes to complete.

Demographics

Gender: Age: Business Unit:

Number of years employed by Telstra: Number of years employed in current postion:

How are you employed?: How are you paid?: Length of Contract:

Are you currently a supervisor or manager of one or more workers in your department? If yes: How Many? 0

On average, how frequently would you attend face-to-face training courses for professional development?

On average, how frequently would you undertake E-learn training courses for professional development?

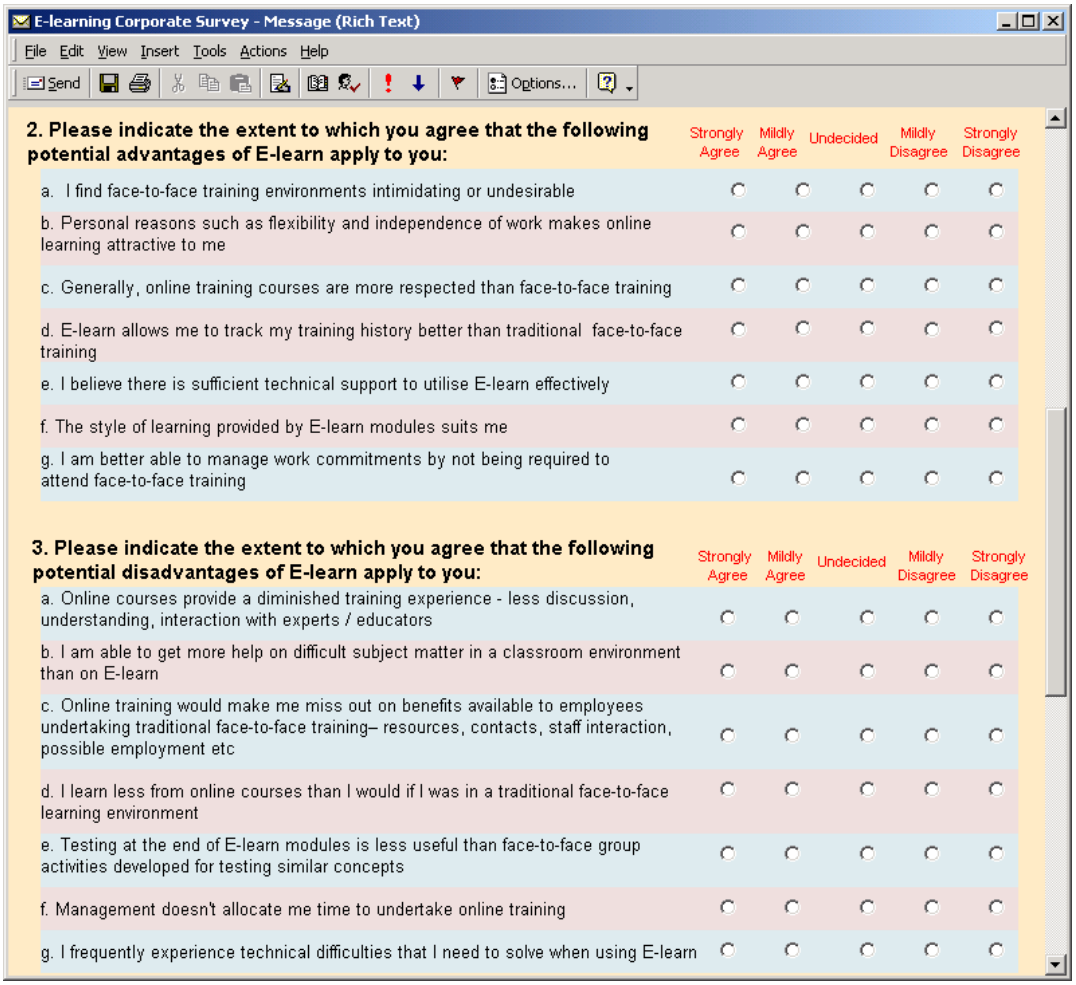
Approximately how many E-learn training courses have you completed?

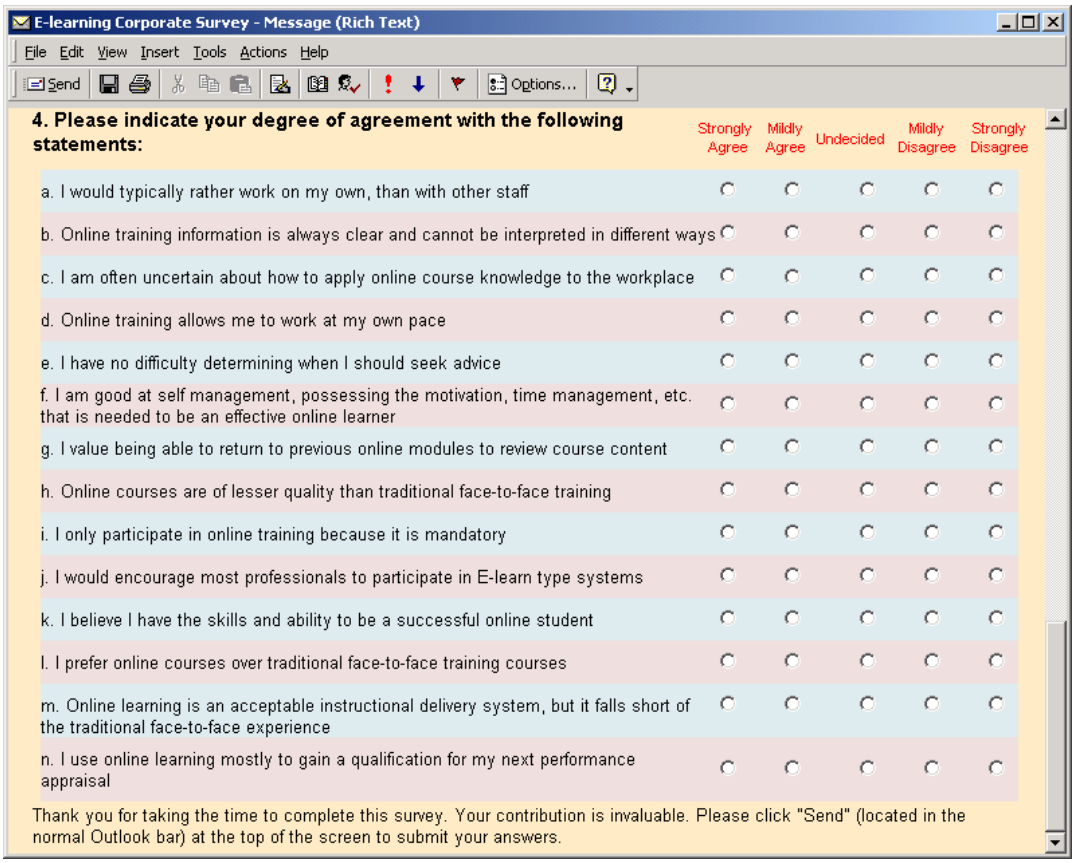
Of the MANDATORY courses studied on E-learn, were they:

Occupational Health and Safety | Technical Training for Software | Personal Development eg. Time Management? | Other

Of the OTHER courses studied on E-learn, were they:

Occupational Health and Safety | Technical Training for Software | Personal Development eg Time Management? | Other


E-learning Corporate Survey - Message (Rich Text)
File Edit View Insert Tools Actions Help
Send
Options...
2. Please indicate the extent to which you agree that the following potential advantages of E-learn apply to you:
Strongly Agree
Mildly Agree
Undecided
Mildly Disagree
Strongly Disagree
a. I find face-to-face training environments intimidating or undesirable
b. Personal reasons such as flexibility and independence of work makes online learning attractive to me
c. Generally, online training courses are more respected than face-to-face training
d. E-learn allows me to track my training history better than traditional face-to-face training
e. I believe there is sufficient technical support to utilise E-learn effectively
f. The style of learning provided by E-learn modules suits me
g. I am better able to manage work commitments by not being required to attend face-to-face training
3. Please indicate the extent to which you agree that the following potential disadvantages of E-learn apply to you:
Strongly Agree
Mildly Agree
Undecided
Mildly Disagree
Strongly Disagree
a. Online courses provide a diminished training experience - less discussion, understanding, interaction with experts / educators
b. I am able to get more help on difficult subject matter in a classroom environment than on E-learn
c. Online training would make me miss out on benefits available to employees undertaking traditional face-to-face training– resources, contacts, staff interaction, possible employment etc
d. I learn less from online courses than I would if I was in a traditional face-to-face learning environment
e. Testing at the end of E-learn modules is less useful than face-to-face group activities developed for testing similar concepts
f. Management doesn't allocate me time to undertake online training
g. I frequently experience technical difficulties that I need to solve when using E-learn


E-learning Corporate Survey - Message (Rich Text)
File Edit View Insert Tools Actions Help
Send
Options...
4. Please indicate your degree of agreement with the following statements:
Strongly Agree
Mildly Agree
Undecided
Mildly Disagree
Strongly Disagree
a. I would typically rather work on my own, than with other staff
b. Online training information is always clear and cannot be interpreted in different ways
c. I am often uncertain about how to apply online course knowledge to the workplace
d. Online training allows me to work at my own pace
e. I have no difficulty determining when I should seek advice
f. I am good at self management, possessing the motivation, time management, etc. that is needed to be an effective online learner
g. I value being able to return to previous online modules to review course content
h. Online courses are of lesser quality than traditional face-to-face training
i. I only participate in online training because it is mandatory
j. I would encourage most professionals to participate in E-learn type systems
k. I believe I have the skills and ability to be a successful online student
l. I prefer online courses over traditional face-to-face training courses
m. Online learning is an acceptable instructional delivery system, but it falls short of the traditional face-to-face experience
n. I use online learning mostly to gain a qualification for my next performance appraisal
Thank you for taking the time to complete this survey. Your contribution is invaluable. Please click "Send" (located in the normal Outlook bar) at the top of the screen to submit your answers.

Appendix B

Main Study Demographic Data

Gender

Valid	Distributed		Returned		Response Rate (%)
	Frequency	Valid Percent	Frequency	Valid Percent	
Male	340	45.2	167	44.7	49.1
Female	413	54.8	207	55.3	50.1
System Missing	0	0	0	0	
Total	753	100	753	100	

Length of Employment with Current Organisation (years)

Valid	Distributed		Returned		Response Rate (%)
	Frequency	Valid Percent	Frequency	Valid Percent	
>5	253	33.7	112	32.9	44.2
5-10	242	32.3	112	30.2	46.3
10-25	195	26.0	104	28	53.3
>25	60	8.0	33	8.9	55
Total	750	100	371	100	49.5
System Missing	3		3		
Total	753	100	374	100	

Management Positions

Valid	Frequency	Valid Percent
Manager	76	20.3
Non-Manager	297	79.7
Total	373	100
System Missing	1	
Total	374	100