Chapter 5

Findings:

Student Survey and Lecturer Interviews

5.1 Overview of this chapter

This chapter presents the findings for research question 2:

What factors[1] contribute to client satisfaction (or frustration) with web-supported learning?

The primary *raison d'être* for an e-learning production unit at a higher education institution is to support academic staff wishing to implement e-learning. This means that lecturers are the direct clients of such a support unit and students are the ultimate clients (end users) of e-learning products (see Figure 1.2: *Role players*). User evaluation of web-supported learning has a significant role to play in the quality assurance process (see chapter 2, sections 2.6.1 and 2.6.2).

Furthermore, in the national and institutional scenario, user surveys are included in the HEQC recommendations after the 2003 pilot audit of the University of Pretoria (Personal communication, D. Malaza, 28 July 2004).

The research methodology for this research question was presented in chapter 3, sections 3.4.3 and 3.4.4 and is revisited briefly here:

- The survey method was used to elicit student feedback on web-supported courses during the first semester in 2003 (January to June). The instrument is the WebCT Experience Questionnaire (Appendix D1).

[1] The word 'factor' is used in the everyday sense of the word, such as 'characteristic' or 'aspect'. No statistical *factor analysis* is implied or intended.

- The interview method was used to elicit qualitative lecturer feedback on the use of web-supported learning and the services rendered by the support team. The interview schedule is the Lecturer Experience and Satisfaction Questionnaire (Appendix E1).

Student survey

At the end of the first semester 2003, a total of 4 650 out of approximately 17 000 WebCT students completed the WebCT Experience questionnaire, a response rate of 27%. Appendix D2 presents the data format, coding and transformation, which formed part of the analysis. In order to put the findings in context, the general findings are presented first (section 5.2.1), followed by those which contribute directly to answering this research question. Some responses to the open questions are reported anecdotally and by giving frequencies of responses from a subset of respondents.

Lecturer interviews

The responses to the closed questions were analysed in tables in Excel. The data from the open questions is reported, organised and summarized, noting patterns, categories and themes (Cohen, Manion & Morrison, 2000).

Samples of the qualitative responses to the open questions are given in Appendix E2. Sections 4.3.1 and 4.3.2 present the findings from the interviews, in respect of closed and open questions respectively. A summary of factors which influence lecturer satisfaction with web-supported learning is given in section 5.3.3. Since this was a pilot application of a newly developed instrument, refinements to the instrument are suggested to enhance its future validity (section 5.3.4).

5.2 Student survey

The findings of the student survey are given in this section, beginning with general findings (demographic and usage statistics), followed by the findings contributing to research question 2, namely the Frustration Index, the

Satisfaction Index and factors contributing to these two indices. The indices are then investigated for age and gender differences (section 5.2.7).

5.2.1 Demographic and usage results

Some items on the questionnaires contributed general information useful to TLEI and the University. Examples of such information are:

- demographic data
- the type of Internet browser most commonly used
- the frequency of usage of WebCT communication tools.

Of the 4 650 students who completed the Experience questionnaire, 52.5% were male and 47.5% were female. The age distribution is shown in Table 5.1.

Table 5.1: *Age distribution of respondents*

Younger than 21	60.9%
21-25	28.2%
26-39	8.9%
40+	1.9%

The majority of respondents (89%) are younger than 26 years. Most of them are undergraduate students, although postgraduate students with WebCT modules are included in the sample.

Usage patterns were measured by the items which asked “Approximately how many times per week did you log on to your web-supported course?” and “What was the approximate duration of your online sessions?” It was found that the majority of students (58.5%) log on 1 to 5 times per week, which appears to be an acceptable level of usage. Most (62.7%) of the sessions were of short duration (up to half an hour).

TLEI was interested to find out to whom students go with technical difficulties.

The intention is that lecturers should not be bothered by technical enquiries and that the appropriate channels should be followed. The findings are presented in Table 5.2.

Table 5.2: *Sources of student support*[2]

My lecturer	23.4%
The Telematic Learning and Education Innovation personnel	12.6%
Support at Student Online Services	22.1%
My fellow students	53.2%
Client Service Centre	14.7%

Students rely fairly heavily on obtaining technical support from their peers, rather than their lecturers. They need to be encouraged to use the help facilities available through Student Online Services and the Client Services Centre, which are designed to provide such support.

Instructional Designers need to know which Internet browsers are most commonly used by students, so that they can ensure compatibility of web-supported courses with the most popular browsers. Figure 5.1 shows the distribution of browsers most commonly used.

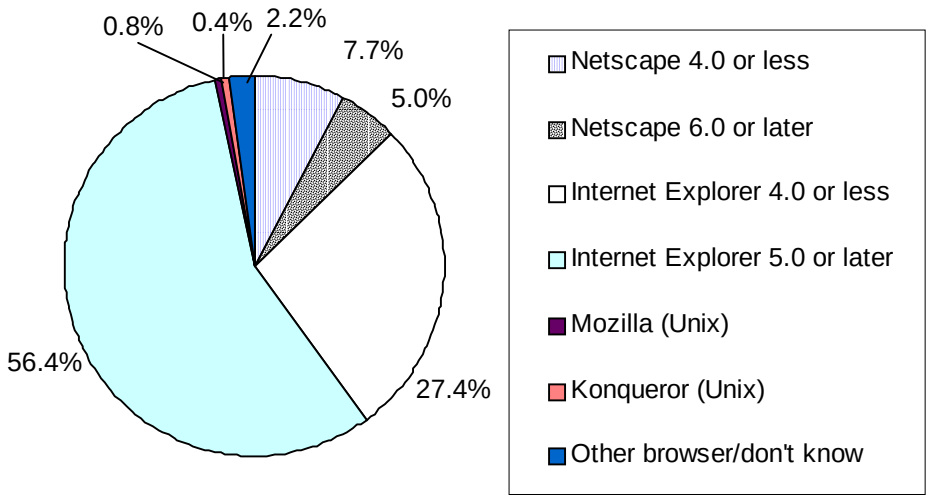


Figure 5.1: Distribution of Internet browsers used by students

[2] This is a multiple response item, so the percentages are not expected to total 100.

Internet Explorer (later versions) is clearly the most commonly used browser. It is the one recommended by the e-learning team to student users of the virtual campus and WebCT.

An item which indicates the extent of lecturer facilitation and the encouragement of deep learning stated:

Question 15:

'To do well in this course, all you really needed was a good memory'.

This item is from Ramsden's Course Experience Questionnaire (CEQ) (Ramsden, 1991). Since it does not necessarily contribute to a student's conscious level of frustration or satisfaction, the results of this item are omitted from those indices and given separately in Table 5.3.

Table 5.3: *Response to 'good memory' requirement*

S. Disagree	Disagree	Uncertain	Agree	S. Agree
19%	33.3%	9%	27.9%	10.8%

It is encouraging to see that 52.3% of students disagreed to some extent with the statement, thereby indicating that more than just a good memory was required to do well in their online courses.

5.2.2 Frustration Index

The Frustration Index was computed for each of the 4 650 respondents as described in chapter 3, section 3.4.5 and Appendix D2. The distribution of the Frustration Index is given in Figure 5.2.

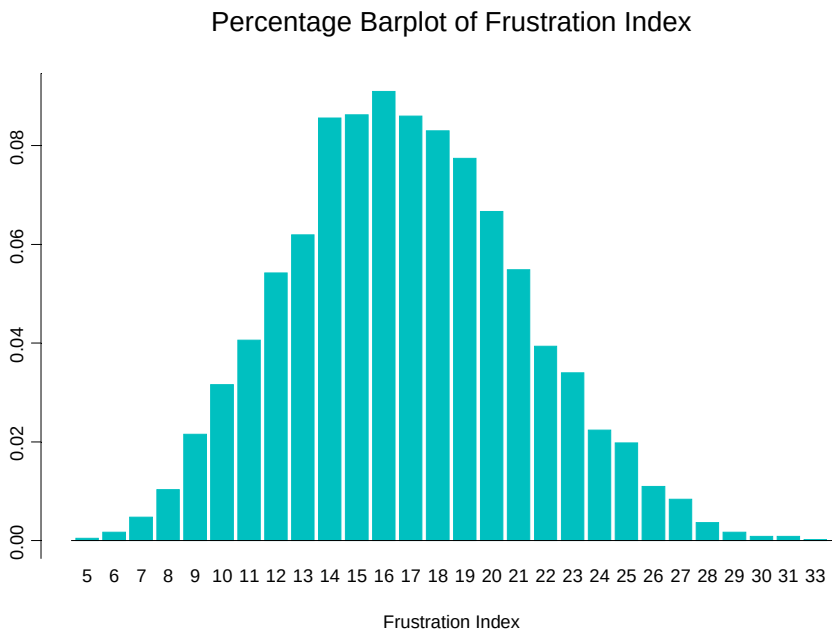


Figure 5.2: Distribution of the Frustration Index

In Figure 5.2 the percentage of respondents is shown on the vertical axis. The range of possible FI scores is shown on the horizontal axis. A low FI score implies a low level of frustration; a high FI score implies a high level of frustration. Although the distribution displays a normal bell-shaped curve, it appears that too many students are experiencing moderate levels of frustration. To summarise the distribution, the frustration levels were clustered according to the categories Low (scores 5 to 12), Moderate (scores 13 to 22) and High (scores 23 to 33). The results are shown in Figure 5.3.

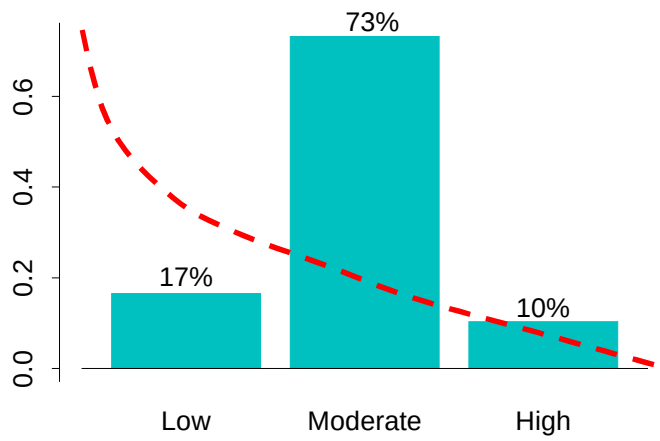


Figure 5.3: Categories for the Frustration Index

It can be seen from Figure 5.3 that 83% of students experience moderate to high levels of frustration. This is clearly unacceptable. According to intuition, the desirable trend would be an inversely proportional outline to the graph, a reverse 'J' shape, as shown in Figure 5.4.

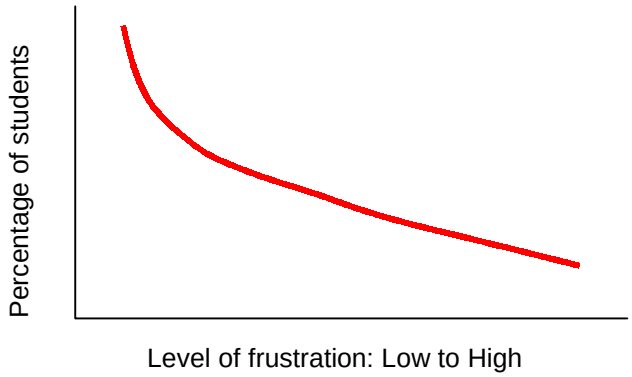


Figure 5.4: Ideal shape of an inversely proportional graph[3]

The ideal shape shown in Figure 5.4 reflects that large numbers of students should experience low levels of frustration and small numbers of students should experience high levels of frustration.

Each of the terms contributing to the Frustration Index (FI) was investigated further to identify predominant sources of frustration. Three categories contributed to FI, namely:

- technical adequacy and technical support;
- educational support;
- affective domain.

Separate indices were computed for each of these contributing factors, namely the TA (Technical Adequacy), ES (Educational Support) and AD (Affective Domain) indices. The findings for each of the contributing indices are given in section 5.2.3.

[3] This 'J' shape is not calculated according to any function, but is simply a free curve to indicate an ideal overall trend.

5.2.3 Factors contributing to student frustration with web-supported learning

Technical Adequacy (TA) Index

The distribution of the Technical Adequacy Index was categorised according to Low, Moderate and High levels of frustration. The graphical representation is given in Figure 5.5.

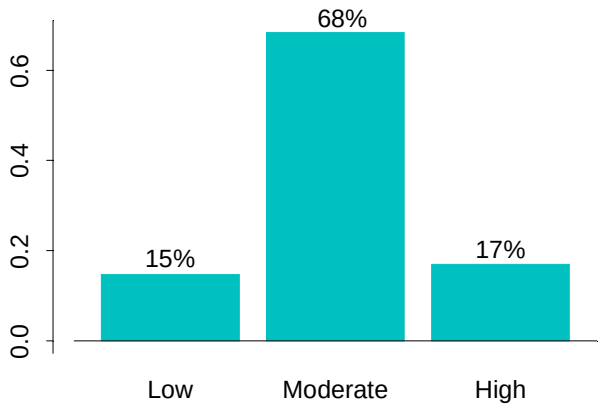
Evidence	Interpretation
	This graph does not exhibit an ideal reverse 'J' shape. It reflects that 85% of students experienced moderate to high levels of frustration with respect to technical issues.

Figure 5.5: Categories for the Technical Adequacy Index

The TA Index is composed of six items from the questionnaire (variables OC, 7, 16, TD, 32, 33). Each of these variables was investigated further. The findings are summarized here and the supporting graphs are presented in Appendix D5 (Figures D1 to D6).

It was encouraging to find that 65% of students have access to a computer of their "own", at least at one location (home, in the residence or at work). Even though many students still do not have access to their own computers, we expect the distribution to improve in the coming years with advances in satellite and mobile technologies.

Although the University cannot influence the access of students to their own computers, the provision of computer technology *on campus* must be adequate. More than three quarters of students who responded (76%) experience a sincere need for printing facilities on campus. The issue of

access to printers is becoming more and more of a problem as the drive to provide web support intensifies. Many academic departments seek to reduce their printing costs by placing greater amounts of information in WebCT, which implies that the printing function devolves to students. Approximately half the students (47%) experience moderate to high frustration due to difficulties in accessing computers on campus. This is an ever-present need, which receives attention from the relevant committees on which TLEI serves.

The nature and extent of technical difficulties experienced by students were investigated. Although 80% of students experience technical difficulties of some sort, 73% reported that the *frequency* of such difficulties is low (less than once per week). Technical support services are generally efficient in solving technical problems, since 75% of difficulties are solved within 24 hours.

For all the respondents, the mean frequency of technical difficulties and mean waiting time for solution were calculated from Appendix D5 (Figures D5 and D6 respectively). In the following calculations, the frequencies (or time)[4] on the horizontal axis provide the values of f_i (or t_i respectively) and the probabilities on the vertical axis provide the values of p_i.

The estimated expected frequency of technical difficulties (from Figure D5) is:

$$\sum f_i.p_i = (0.5)(0.73) + 3(0.24) + 8(0.02) + 14(0.01) = 1.4 \text{ times per week.}$$

The estimated expected waiting time for technical difficulties to be solved (from Figure D6) is:

$$\sum t_i.p_i = (0.5)(0.5) + 1(0.25) + 4(0.11) + 8(0.04) = 1.26 \text{ days.}$$

The contributing factors to the Technical Adequacy Index are insufficient computers and printers on campus and the high proportion of respondents who experience technical difficulties of some sort. These factors influenced the high central bar in Figure 5.5.

[4] For example, “less than once per week” and “half a day” translated into f_1=0.5 and t_1=0.5 respectively

Educational Support (ES) Index

The distribution of the Educational Support (ES) Index was categorised according to Low, Moderate and High levels of frustration. The graphical representation is given in Figure 5.6.

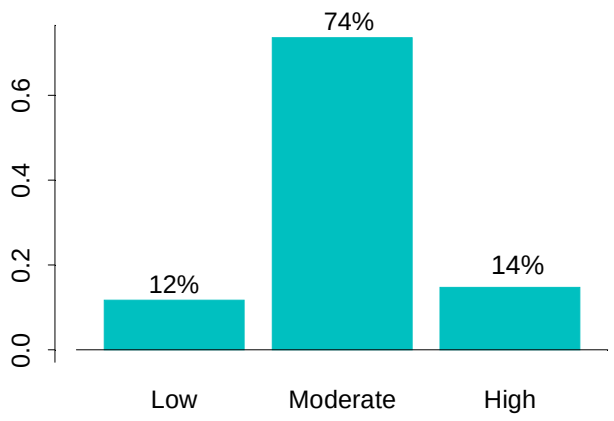
Evidence	Interpretation
	This graph does not exhibit an ideal reverse 'J' shape: 88% of respondents experience moderate to high levels of frustration with educational support, which is not acceptable.

Figure 5.6: Categories for the Educational Support Index

The ES Index is composed of two items from the questionnaire (variables 39 and TS: student support CD-Rom and student training in WebCT). Each of these variables was investigated further. The findings are summarized here and the supporting graphs are presented in Appendix D6 (Figures D7 and D8).

Only 49% of students who received the student support CD-Rom are of the opinion that it is "great". The support CD-Rom was substantially re-designed and improved in the latter half of 2003, in order to improve this statistic.

Student hands-on system training should equip students sufficiently to participate in their web-supported courses. Since 2003, the computer literacy course that is compulsory for undergraduate students now includes training in WebCT, so we expect that the upcoming generations of students will be better equipped to use the platform.

A cross tabulation (Table 5.4) of the two variables contributing to the ES Index showed evidence of a strong correlation between them:

Table 5.4: *Cross tabulation of Student CD-Rom and Student Training*

V39	TS: Training Session		RowTotl
Student Support CD	0: equipped me	1: did not equip me	
0: not received	544 0.2212 0.3261 0.1170	1915 0.7788 0.6422 0.4118	2459 0.529
1: it's great	662 0.6118 0.3969 0.1424	420 0.3882 0.1408 0.0903	1082 0.233
2: it's reasonable	424 0.4482 0.2542 0.0912	522 0.5518 0.1751 0.1123	946 0,203
3: it's poor	38 0.2331 0.0228 0.0082	125 0.7669 0.0419 0.0269	163 0.035
ColTotl	1668 0.36	2982 0.64	4650

```
Test for independence of all factors
Chi^2 = 547.515 d.f.= 3 (p=0)
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The large Chi squared value and small *p*-value are evidence of a strong relationship between these two variables. To understand this relationship, we need to consider the conditional distributions, both row-wise and column-wise, as shown by the arrows in the Table 5.4.

Consider the row where V39=1: given student opinion that the Student Support CD-Rom was great, 61% of respondents felt the training equipped them and 39% felt the training did not equip them. By contrast, consider the row where V39=3: given student opinion that the CD-Rom was poor, only 23% of respondents felt the training equipped them and 77% felt the training did not equip them. This shows that students who were positive about the CD-Rom tended to be positive about the student training, whereas students who were negative about the CD-Rom tended to be negative about the student training.

Consider now the column where the variable 'Training Session' (TS) =1: given student opinion that the training session did **not** equip them, 64% of these respondents did not receive the student support CD-Rom. This gives rise to two areas of lack of support for these students.

The contributing factors to the ES Index are the inadequacy of both the student support CD-Rom and the student training in WebCT. Negotiations are in progress with respect to funding so that all WebCT students will receive the CD-Rom in future. The student training will also be re-considered, giving emphasis to practical hands-on application rather than the theory of the virtual classroom.

Affective Domain (AD) Index

The distribution of the Affective Domain (AD) Index was categorised according to Low, Moderate and High levels of frustration. The graphical representation is given in Figure 5.7.

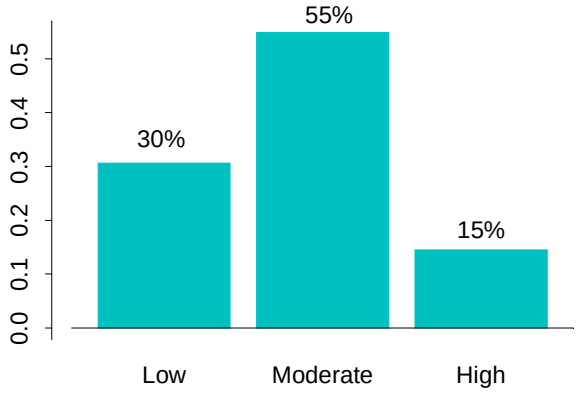
Evidence	Interpretation
	This graph does not exhibit an ideal reverse 'J' shape: 70% of respondents experience moderate to high levels of frustration with respect to emotions and feelings involved in the web-supported learning experience.

Figure 5.7: Categories for the Affective Domain Index

The AD Index is composed of four items from the questionnaire (variables 49, 50, 55 and 56). Each of these was investigated further.

These variables were measured on a 5-point Likert scale. The 'Uncertain' option was moved to the centre of the distribution; the 'Strongly Disagree' and

'Disagree' categories were merged, as were the 'Agree' and 'Strongly Agree' categories. Given negatively phrased statements, the ideal shape is still a reverse 'J' shape, which would reflect higher numbers of students who disagree and lower numbers of students who agree with the statement.

The findings are summarized here and the supporting graphs are presented in Appendix D7 (Figures D9 to D12).

Forty percent (40%) of students experienced web-supported learning to be impersonal and 24% reported that their classmates were slow to respond to them online. Although these statistics are not unduly high, they could be improved by better mentoring, encouragement and guidance from course facilitators (lecturers).

Only 31% of students directly experienced feelings of annoyance and/or stress during their web-supported learning experience. Sixty six percent (66%) of students reported that they find web support provides the convenience of anywhere, anytime learning. These are encouraging findings.

From the foregoing analysis of the TA, ES and AD Indices, it emerged that the factors which contribute to the Frustration Index (Figure 5.3) are:

- insufficient computers available on campus
- insufficient printing facilities available on campus
- extent of technical difficulties experienced
- insufficient support from the student CD-Rom
- inadequate student training in WebCT
- a somewhat impersonal learning experience
- slow response from classmates
- some feelings of annoyance and/or stress.

All these factors require attention in order to reduce current levels of student frustration with their web-supported learning experience.

5.2.4 Satisfaction Index

The Satisfaction Index was computed for each of the 4 650 respondents as described in chapter 3, section 3.4.5 and Appendix D2. The distribution of the Satisfaction Index is given in Figure 5.8.

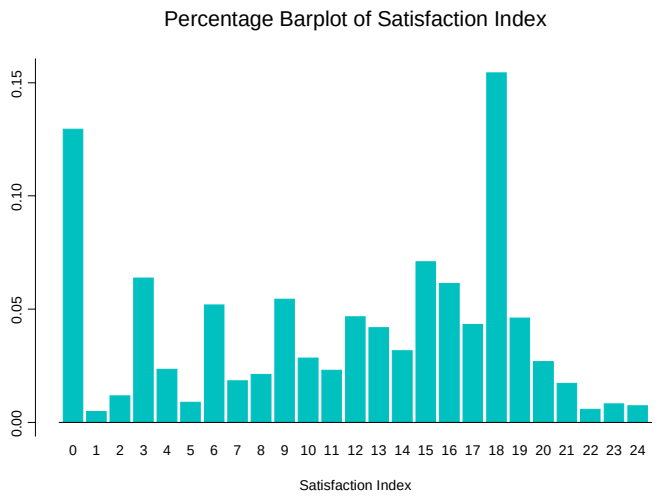


Figure 5.8: Distribution of the Satisfaction Index

In Figure 5.8 the percentage of respondents is shown on the vertical axis. The range of possible SI scores is shown on the horizontal axis. A low SI score implies a low level of satisfaction; a high SI score implies a high level of satisfaction. Since this skewed distribution is not easy to interpret, the satisfaction levels were clustered according to the categories Low (scores 0 to 5), Moderate (scores 6 to 15) and High (scores 16 to 24) (Figure 5.9).

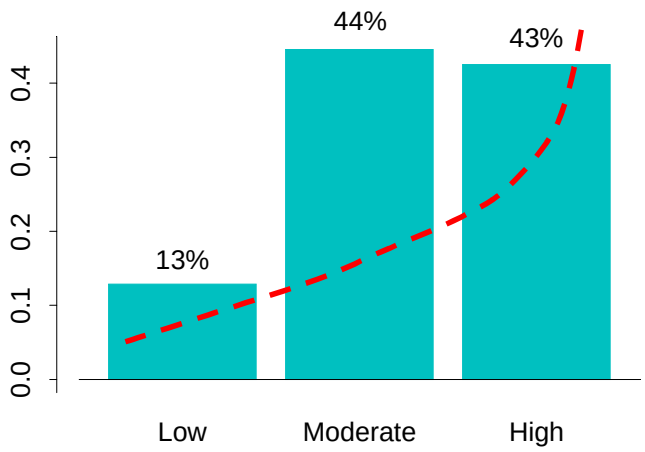


Figure 5.9: Categories for the Satisfaction Index

It can be seen from Figure 5.9 that only 43% of respondents experience high levels of satisfaction. This figure should preferably be higher. According to intuition, the desirable trend would be a directly proportional outline to the graph, a 'J' shape, as shown in Figure 5.10.

Figure 5.10: Ideal shape of a directly proportional graph

The ideal directly proportional shape implies that small numbers of students should experience low levels of satisfaction and large numbers of students should experience high levels of satisfaction.

Each of the terms contributing to the Satisfaction Index (SI) was investigated further to identify predominant sources of satisfaction. Two categories contributed to SI, namely:

- use of the communication tools;
- perceived learning.

Separate indices were computed for each of these contributing factors, namely the CT (Communication Tools) Index and PL (Perceived Learning) Index. The findings for each of these contributing indices are given in section 5.2.5.

5.2.5 Factors contributing to student satisfaction with web-supported learning

Communication Tools (CT) Index

The distribution of the Communication Tools (CT) Index was categorised according to Low, Moderate and High levels of satisfaction. The graphical representation is given in Figure 5.11.

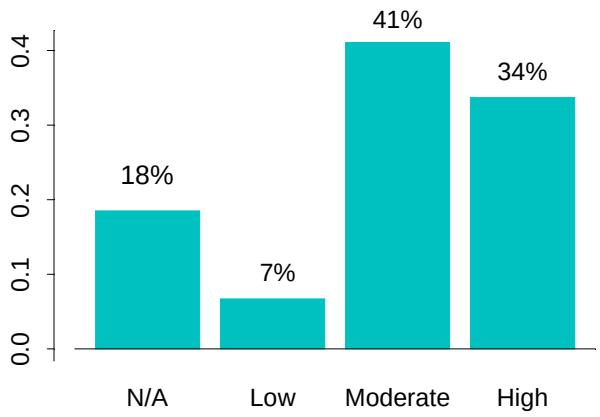
Evidence	Interpretation
	This graph does not exhibit an ideal 'J' shape: too many respondents (41%) are experiencing moderate levels of satisfaction and not enough are experiencing high levels of satisfaction (34%).

Figure 5.11: Categories for the Communication Tools Index

The CT Index is composed of two items from the questionnaire (variables 47and 48). Each of these was investigated further. The findings are summarised here and the supporting graphs are presented in Appendix D8 (Figures D13 and D14).

The findings in respect of the CT Index are encouraging. Sixty two percent (62%) of students felt comfortable communicating online. Thirty nine percent (39%) felt that they were able to express themselves more than they would have in the traditional classroom, although 38% were uncertain on this item. Removing the 'Uncertain' option may be considered in future administrations of the survey, in order to force students to make a decision, where applicable.

Perceived Learning (PL) Index

The distribution of the Perceived Learning (PL) Index was categorised according to Low, Moderate and High levels of satisfaction. The graphical representation is given in Figure 5.12.

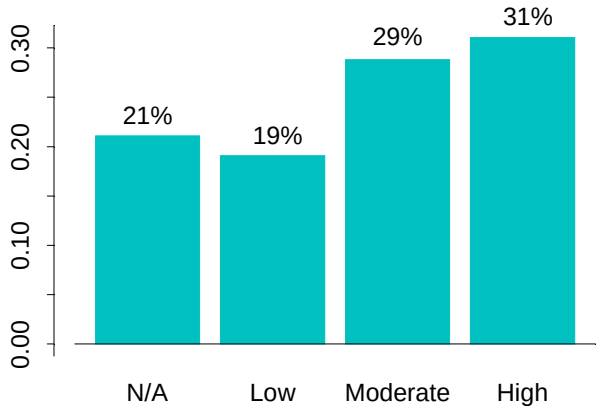
Evidence	Interpretation
	This graph exhibits the beginnings of a 'J' shape, with the exception that too many respondents (21%) selected the 'Not applicable' option and insufficient respondents selected the 'High' option (only 31%).

Figure 5.12: Categories for Perceived Learning Index

The PL Index is composed of four items from the Experience questionnaire (variables 51, 52, 53 and 54). Each of these was investigated further. The findings are summarized here and the supporting graphs are presented in Appendix D9, Figures D15 to D18.

The findings for the PL Index are encouraging. Almost half the respondents (49%) agreed that they learnt from the online contributions of other students, which reflects the value of cooperative and group learning. Thirty nine percent (39%) of students felt that web-supported learning helped to develop their ability to work as a team or group member, although this item again had a fairly high proportion (38%) of responses in the 'Uncertain' category.

Fifty four percent (54%) of students felt that web-supported learning developed their ability to plan their own work, an important factor identified in the literature review (Time on task – Chickering & Ehrman, 1996). It is encouraging to see that 58% of students found web-supported learning to be an enriching learning experience.

It is acknowledged that the responses in the Perceived Learning category measure students' perceptions of benefits, at the level of Kirkpatrick (1998), Level 1. Scope for further research is to probe actual learning and resulting changes in behaviour.

The analysis of the Satisfaction Index is more positive and encouraging than it was for the Frustration Index. From the foregoing analysis of the CT and PL Indices, it emerged that the factors which contribute to the levels of satisfaction reflected in the Satisfaction Index (Figure 5.9) are:

- feeling comfortable communicating via online tools
- feeling more freedom to express oneself than in a traditional classroom
- learning from the contributions of other students
- promoting one's ability to work as a team or group member
- promoting one's ability to plan one's own work
- experiencing an enriching learning environment.

A factor which should, but currently does not, contribute sufficiently to the level of satisfaction, is more interaction and collaboration which could be encouraged by the lecturer in order to make the web-supported learning experience less impersonal.

The Frustration and Satisfaction indices have been computed and their contributing factors summarized. Since 83% of students experience moderate to high levels of frustration (Figure 5.6) and 87% of students experience moderate to high levels of satisfaction (Figure 5.24), it is natural to ask whether there is any correlation between levels of frustration and levels of satisfaction. The two indices were plotted against each other and the resulting box plot is given in Figure 5.34.

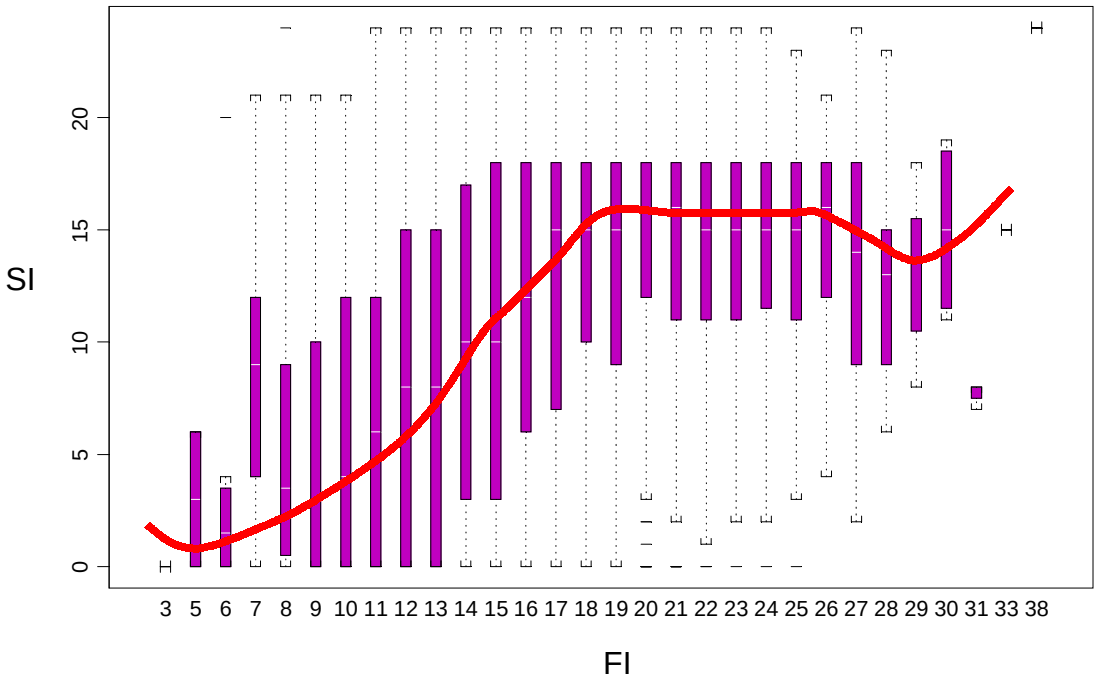


Figure 5.13: Box plots of the conditional distribution of the Satisfaction Index (SI) for each given value of the Frustration Index (FI)

A box plot is a five-number summary of a distribution showing the minimum value, lower quartile, median, upper quartile and maximum value. It is a useful graphical representation of the distribution. In Figure 5.13, each conditional distribution of SI for a given FI is depicted by the vertical box plots. For our purposes, the important information is gleaned from the behaviour of the median SI values, as indicated by the central "dashes", as FI increases. The medians form an approximate S-shaped curve, representing the regression[5] of SI on FI (see the approximate regression line superimposed on the graph). There is some variation around the top end of the S curve, which can be attributed to sampling variation and the lower frequencies of SI. The regression relationship illustrates that students with a low value of FI tend to exhibit also a low value of SI and those with higher values of FI tend to exhibit higher values of SI.

[5] For this data, the regression relationship is S-shaped and not linear.

5.2.6 Analysis of open questions

The WebCT Experience survey (4 650 respondents) contains three open items:

- *Question 28: positive aspects experienced;*
- *Question 29: negative aspects experienced ;*
- *Question 30: suggestions to improve the web-supported course.*

A sample of typical open responses is given in Exhibit 5.1, in which the comments are presented as given by the respondents, without correction. The left hand column indicates the frequency of the response, which is mainly "1" due to the open nature of the items.

Exhibit 5.1: *Sample of open responses in html format*

1	I could learn where I want, when I want.
1	It was great, now I know how to use the internet.
1	I enjoyed working in groups * The learning experience was enriching. * I learned a lot from my group members
1	I got to see my results. * I got access to solutions. * I got to give my views & questions. I got to learn alot.
1	I had my computer skills developed * I had a new learning experience * I had my typing speed skills enriched

1	More computer facilities, printing facilities please!!! Attention to technical problems
1	more computer labs like the maroon one
1	More computer labs should be made available on campus Access to computer facilities should be easy

6	more computers
1	more computers more help
1	More computers More technicians
1	More computers and easier acsess to labs
1	More computers and more printing faciliates.

continued…

1	lecturers shoiuld be as up to date as we are
1	Lecturers must learn how to work with computers
1	Lecturers should make more effort on WebCT and respond to students\' questions and enquiries. All results should be made available on WebCT, not via email.
1	lecturers should keep it up to date and make sure that everyone has access to a pc if all the info is on there!
1	lectures should be forced to use it more

The open responses for a subset of the data[6] were coded by a student assistant, using the coding frame developed in earlier pilot administrations of the survey (Appendix D3). A sample of the coded data is given in Appendix D4.

The frequencies[7] for each of the open items are given in descending order in Tables 5.5, 5.6 and 5.7. The numbers of the options refer to the respective numbers of the responses on the coding frame.

Table 5.5: *Frequencies for Positive comments*

	Option	Percentage
1:	Convenience / ease of access / flexibility / anywhere, anytime / user friendly	41 %
2:	Information clear and accessible / can review, repeat	15%
13:	Challenging, exciting, enriching, new learning experience	9%
14:	Other	7%
10:	Improved self esteem / self confidence / independence / self discipline	6%
11:	Improved technical skills / computer literacy / searching information	6%

A fairly high proportion (41%) of the sample experienced web-supported learning to be convenient, flexible and user friendly. Fifteen percent of the sample found it helpful to be able to access learning material frequently and to review it before examinations.

[6] After coding 100 open responses (of the 4 650 respondents x 3 open questions each), a point of data saturation was reached, after which no new themes or issues were identified. The full set of open responses has been perused and used anecdotally in reports and presentations.
[7] Only frequencies of 5% or higher are reflected in these tables.

Table 5.6: *Frequencies for Negative comments*

	Option	Percentage
16:	Other	32%
1:	Technical problems / slow internet / slow download / problems uploading or downloading	17%
15:	Lack of access to computers and/or printers on campus	11%
5:	Slow updates to course, e.g. marks, calendar, deadlines	9%
2:	Malfunctions / errors / illegible acrobat files / links not working / difficulties with attachments	7.5%
9:	Inadequate / incomplete course material / class notes not available / not on time / confusing / vague	6%

Technical problems reflect the highest percentage in the distribution on negative comments. It is noteworthy that 11% of the sample reported problems with lack of access to computers and/or printers on campus, even though this item had been covered in the closed questions.

Table 5.7: *Frequencies for Suggestions*

	Option	Percentage
11:	Other	50%
2:	More courses / lecturers should use WebCT	10%
3:	Get lecturers to use it better / motivate lecturers / more interaction, feedback from lecturers / buy-in from lecturers	6%
6:	Better technology skills for lecturers / students / more training in WebCT	8%
9:	More frequent updating of marks / content / dates / groups	6.5%
1:	More powerful server / faster network	5%
8:	After hours support / IT support / prompt solution of problems	5%

Half the respondents in the sample made suggestions that were not covered in the coding frame. The coding frame should be modified in future to include some of the other suggestions made. Such ongoing refinement is part of gaining a deeper understanding of and being able to make more comprehensive interpretations of qualitative data.

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It is noteworthy in Table 5.7 that students are applying pressure for more lecturers to put their courses on WebCT and to facilitate them in a more interactive way. The difficulty in obtaining buy-in and commitment from lecturers was also mentioned by lecturers in the lecturer interviews (see section 5.3.2).

5.3 Lecturer interviews

The findings for the closed questions are presented first (section 5.3.1), followed by the findings from the open questions (section 5.3.2).

5.3.1 Findings from closed questions

The findings for the closed questions are analysed in the following categories:

- value of the e-learning component (Table 5.8)
- use of the online communication tools (Table 5.9)
- WebCT training attended (Table 5.10)
- level of satisfaction with services received (Table 5.11).

Seven items about the value of the e-learning component were assessed using a 5-point Lickert scale. An eighth item rated the overall worth of the e-learning component on a scale from Excellent to Unacceptable. The findings for these eight items are summarised in Table 5.8.

Table 5.8: *Lecturers' assessment of the value of the e-learning component*

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
1.	In my opinion, the e-learning component adds value to the learning experience for students.				12	10	**22**
2.	The e-learning component promotes active learning / problem-based learning / learner-centered activities.		1	5	10	6	**22**
3.	I used the e-learning component to support me in my administrative tasks.	1	1	4	7	8	**21**
4.	I found that the e-learning component supported me in the facilitation of learning.			3	10	9	**22**
5.	The e-learning component contributed to the achievement of subject specific learning outcomes.		2	2	13	5	**22**
6.	The e-learning component provided meaningful assessment opportunities.		1	7	6	6	**20**
7.	The e-learning component enhanced the learning experience due to instructional design features, e.g. activities, chunking, resources, interaction.		2	4	11	3	**20**
		A Excellent	**B Very Good**	**C Good**	**D Poor**	**E Unaccept-able**	**Total**
8.	My overall evaluation of the **worth** of this e-learning component in enhancing the teaching and learning experience:	8	11	3			**22**

In all the above seven positively phrased items, at least half of the respondents reacted positively by selecting 'Agree' or 'Strongly agree'. All respondents to the eighth item rated the overall worth of the e-learning component as 'Good' or better.

One of the individuals who selected 'Disagree' for some items explained that the students in her course did not use the WebCT component very much, as they are lacking in computer skills. Even after the WebCT training, they needed a refresher course. She plans to promote the use of WebCT much more actively in 2004, especially the online submission of assignments.

A second respondent who selected 'Disagree' in some of the above items explained that WebCT is currently used largely to provide information to

students. Lecturers on the programme are generally guest lecturers from the business world. They are not necessarily committed to using WebCT fully. The individual who selected 'Strongly disagree' with respect to administrative support simply does not make use of the administrative aspects of WebCT in his research-based postgraduate course.

Some of the respondents qualified their responses with remarks such as those shown in Exhibit 5.2.

Exhibit 5.2: *Qualifying remarks made by respondents*

- It depends on the way it is handled by lecturers.
- If it is used properly, it should really add value.
- In theory, yes...
- These statements may be applicable, but not necessarily.
- At this stage, I only use WebCT on the level of a post box.
- The administrative support I use is the student tracking and mark schedules.
- The students are learning a great deal related to information searches and computer navigation – not directly related to module.
- Hopefully it will in the future.

The qualifying remarks illustrate the fact that even if lecturers are not currently using WebCT for deeper levels of interaction and facilitation, they are aware of its potential for these purposes. Lecturers' use of the online communication tools is reflected in Table 5.9 and discussed thereafter.

Table 5.9: *Lecturers' use of the communication tools in WebCT*

Rank these online tools according to:	**Discussions**	**e-mail**	**Chat**	**Calendar**
Frequency of your use of the tool:				
0=never	3	3	19	13
1=seldom	3	2	2	2
2=monthly	3	1	1	2
3=weekly	7	8		3
4=daily	6	8		2
Your opinion of the tool's usefulness:				
0=useless	1	3	17	8
1=supportive	8	8	3	8
2=indispensible	12	11	1	5

Table 5.9 shows that the discussions and e-mail tools (both asynchronous) are the most frequently used – their frequency of use ranges from low scores on 'never' to high scores on 'weekly' and 'daily'. The chat tool is the opposite, with the majority of respondents not making use of it. This is because the synchronous nature of the tool is appropriate in some courses and not in others. One respondent makes efficient use of the chat room on the evening prior to the examination, for students to pose last minute queries.

The Calendar, when used, was found to be "useful for lecturers and students in a flexible learning programme". One respondent derives great benefit from the fact that the Calendar is totally under her control, without needing the assistance of an instructional designer to make changes or bookings.

A shortcoming of the data collection instrument is that it does not offer the option "not applicable" on the second part of this item (see Table 5.9). For example, if tools such as the Chat and Calendar are never used in a particular course, respondents were obliged to select "0" in respect of their usefulness. Clearly "not applicable" would have been more accurate in such cases.

A further shortcoming of the instrument is that the e-mail tool is not qualified as to whether it is the internal WebCT e-mail tool, personal e-mail or a listserv that is being referred to. All such versions of e-mail clearly contribute to promoting electronic communication between lecturers and students. Some respondents indicated that they never use the e-mail tool in WebCT, but that they do make extensive use of other forms of e-mail.

TLEI offers staff training courses in WebCT at various levels of complexity. All lecturers embarking on WebCT are required to complete at least the one-day WebCT High Impact course. The more advanced courses are optional, depending on how involved the lecturer wishes to become in the creation and maintenance of WebCT courses. Table 5.10 shows the number of respondents who attended the various training courses.

Table 5.10: *WebCT staff training courses attended*

		High Impact	Inter-mediate	Web Page Design	WebCT Designer
Which WebCT training course/s did you attend?		19	5	3	5
Did you attend each training course before, during or after you presented your module?					
	b=before	9	2	1	3
	d=during	6	2	2	2
	a=after	1	1		

Almost all the respondents have attended the required WebCT High Impact course. Some attended it four years ago and indicated a desire to repeat it, due to new functionality in later versions of the software. Few lecturers go on to complete the more advanced training courses. This implies that the majority of academic staff still rely on the support of the instructional design team at TLEI.

The second item in Table 5.10 shows that respondents generally choose to attend the training either before or during the presentation of their web-supported modules. The findings from this item in future administrations of the Lecturer Experience Questionnaire will investigate the impact of training offered by TLEI.

One item in the survey asked directly about client satisfaction with the service levels of various sections of the support team. The data is presented in Table 5.11 and plotted in Figure 5.14.

Table 5.11: *Level of satisfaction with services rendered*

	A Excellent	B Good	C Satis-factory	D Poor	E Not applicable	F Unaware of service	Total
Project Management	12	4			5		21
Education Consultancy	6	3	1		9	2	21
Instructional Design	13	6			2		21
Graphics	6	4	2		8	1	21
Information Service (AIS)	10	6	2	2	1		21

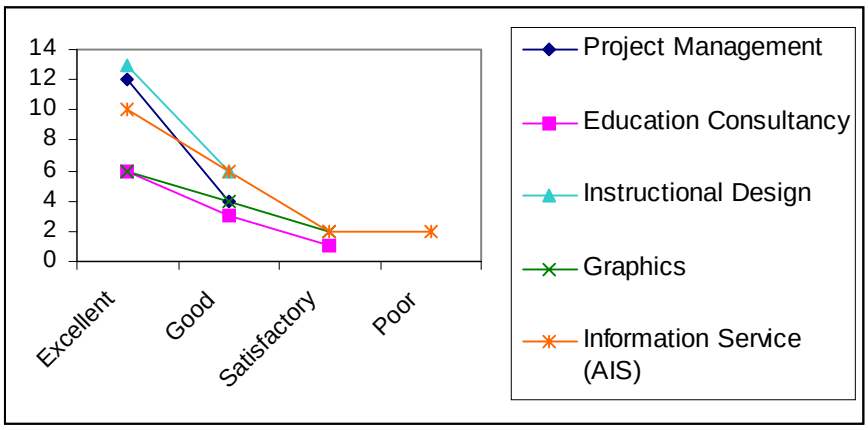

Figure 5.14: Lecturer satisfaction with service levels of TLEI and AIS

Figure 5.14 exhibits the desired trend, in that there are higher numbers of 'Excellent' responses and lower numbers of 'Poor' responses. The immediate services offered by the e-learning unit are project management and instructional design. These services both enjoyed high numbers of responses in the 'Excellent' and 'Good' categories. The only service which attracted responses in the 'Poor' category was the Academic Information Service, and then only from two respondents. Some problems with this service were also mentioned in response to one of the open questions (see Exhibit 5.1).

Many respondents indicated that some of the services are not applicable or not required. This may be due to various possibilities:

- the lecturer is a WebCT expert and can carry out the functions him or herself;
- a WebCT assistant in the academic department carries out the functions;

- a template is used, thus obviating the need for graphic services;
- the WebCT course is a long-standing one, requiring maintenance only.

Many positive comments were elicited by this item. Some such comments are shown in Exhibit 5.3.

Exhibit 5.3: *Positive comments on services rendered*

- I really enjoyed working with the team. You people make ME look good!
- Polite, knowledgeable, quick turnaround time, bends over backwards for clients.
- I am amazed every day by the outstanding, enthusiastic and helpful manner in which TLEI encourages, supports and leads us.
- Organised, involved, quick feedback provided.
- The Instructional Designer really helps us tremendously – she is a valued team member.
- I believe that the instructional designers do not receive adequate recognition for their hard work!
- You were always a phone call away – thanks for that.
- The dedication and outstanding support of staff members are highly appreciated.
- I have always had excellent service. The Instructional Designer is always willing to help and always extremely positive.

The responses to the closed questions can be summarised as being overwhelmingly positive, particularly with regard to the support provided by TLEI. Where there were reservations or qualifications to statements, these could be explained by the type and level of WebCT usage in a particular department. Some respondents indicated that they would like to refresh their knowledge of WebCT and engage in the use of web-supported learning at deeper levels.

5.3.2 Findings from open questions

The flood of verbal responses from a qualitative instrument necessitates data reduction, selection and careful display (Miles & Huberman, 1994).

I analysed each category of open responses by using coloured highlighters to code remarks on similar themes. The findings are presented here according to the following broad categories:

- problems experienced
- benefits gained
- lessons learnt.

Problems experienced

By perusing Tables E1 and E2 (Appendix E2), five themes were identified. These are listed together with the number (n) of responses per theme in Table 5.12.

Table 5.12: *Summary of problems experienced*

Theme	Number of responses (n)
No (or few) problems	8
1. Technical problems	15
2. Getting students to participate (academically and technically)	9
3. Getting lecturers on board	7
4. Time required (in planning and development)	6
5. Library / copyright problems	5

Technical problems with respect to new software versions and the integration of campus IT infrastructure were mentioned frequently. Other problems are the human issues of commitment and buy-in from lecturers, getting students to participate actively and meaningfully, timely preparation and planning of learning materials, and scanning and copyright of reference materials.

Benefits gained

By perusing Tables E3 and E4 (Appendix E2), nine themes were identified. These are listed together with the number (n) of responses per theme in Table 5.13.

Table 5.13: *Summary of benefits gained*

Theme	Number of responses (n)
1. Organisational / administrative benefits	13
2. Communication and interaction with students	8
3. Savings in terms of time, money, queries	7
4. Good support from TLEI	6
5. Re-thinking / re-planning / re-structuring	4
6. E-learning added value	3
7. Personal and professional development	3
8. Lecturers coming on board	2
9. Students gaining new experiences, skills	2

The comments show that lecturers who use web-supported learning at deeper levels have experienced its benefits. Most notable are organisational benefits, communication and interaction with students, and savings in terms of resources and personal energy. The support of the e-learning team, from the point of view of educational input, structuring and improvement of presentation was mentioned. The need for lecturers to plan, organise, reflect on and re-design their learning materials was seen as benefiting the eventual learning experience of students.

Lessons learnt

By perusing Table E5 (Appendix E2), six themes were identified. These are listed together with the number (n) of responses per theme in Table 5.14.

Table 5.14: *Summary of lessons learnt*

Theme	Number of responses (n)
1. Change management (lecturers and students)	6
2. Training (lecturers and students)	5
3. Distance learning / larger numbers of students	4
4. Human element	4
5. Discussions / growth	2
6. Internationalisation	2

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Change management, which was mentioned by six participants, refers to the need to keep lecturers and students informed and committed, especially in the light of proposed system changes. It is noteworthy that training for lecturers and students was mentioned with a fairly high frequency.

The human element refers to the perspectives and focus of lecturers and students in order to make e-learning a success. Internationalisation has been enabled in various postgraduate programmes, due to the global nature of e-learning.

5.3.3 Factors contributing to lecturer satisfaction with web-supported learning

Noteworthy factors synthesized from the above findings are the following:

1. Lecturers don't like surprises with respect to technology upgrades. Keep them well informed and well supported. Maximise technical reliability and don't expect lecturers to solve technical problems themselves or to wait too long for solutions.
2. Organisational and administrative benefits are practical, quick to realise and appreciated by lecturers.
3. Communication and interaction with students and evidence of their increased growth and development are valued by lecturers who facilitate these aspects online.
4. Staff and student training are critical for the success of e-learning.
5. The contributions of support services are invaluable, for example e-learning design and development units and academic information services. Such services need to be attuned to the needs of lecturers and to be creative, prompt and efficient.
6. Even though there is an initial increased time commitment in designing and developing an online course, subsequent savings in terms of time, money and physical queries are appreciated by lecturers.
7. Human issues and change management take time to exhibit positive effects.

Amongst the problems experienced by lecturers, the one which caused the most inconvenience and frustration was the extent of system changes and upgrades which were implemented in early 2004 and the perceived lack of advance warning. When lecturers are comfortable with the technology and experience the benefits of e-learning, they not only adopt it, but feel the need for advancement in the levels of web-supported learning they implement.

5.3.4 Suggestions for refinement of the instrument

Various shortcomings of the questionnaire were identified during the pilot application in early 2004. The questionnaire is currently four pages long and could usefully be shortened to three pages by implementing the following suggestions.

Page 1:

1. Insert this introductory question:
   Identify your particular use/s of the e-learning component:

Information sharing ('Post box')	Communication	Assessment	Student tracking

   Responses to this item will contextualise the particular level of usage of e-learning, without respondents having to explain it.
2. Online tools: Include an additional tool: 'External email / Listserv'.
3. In the second part of the ranking question, include a 'Not applicable' option so that a tool's 'usefulness' is not prejudiced by having to select 'useless'.
4. Remove the question about the interpretation of the **worth** or **value** of the e-learning component. More than one respondent indicated that their answer to the 'Benefits' covers the same information as that under the 'worth' or 'value' of the product.

Pages 2 and 3

Do not separate the type of problems or the type of benefits experienced. This complicates the thought processes required from respondents. Simply have 'Problems experienced' and 'Benefits experienced'. This will also simplify the data analysis.

The above suggestions for improvement of the instrument should be implemented in future applications of the Lecturer Experience and Satisfaction Survey. It is recommended that the survey should be completed by lecturers in the annual review and planning project meeting.

5.4 Summary

An integral component of quality assurance theory and practice is client feedback in order to measure client satisfaction. The direct *clients* of an e-learning production unit are lecturers making use of these services. The ultimate clients are students who are the end users of e-learning products. This chapter investigated the levels of frustration and satisfaction of students taking web-supported courses, as well as that of lecturers making use of the support services offered. The student feedback survey was piloted from 2001 to 2002. The data from July 2003 was analysed and reported in this chapter. There were 4 650 responses to the student WebCT Experience Questionnaire.

The questionnaire items were written according to the following categories:

- technical adequacy and technical support (**TA**);
- educational support (supportive resources and training) (**ES**);
- affective domain (feelings and emotions of students) (**AD**);
- use of the communication tools in WebCT (interactivity) (**CT**);
- perceived learning (**PL**).

The first three categories were used to generate a Frustration Index (FI) and the last two categories were used to generate a Satisfaction Index (SI). The

Frustration Index indicated that 83% of respondents experience moderate to high levels of frustration in their web-supported courses. The Satisfaction Index indicated that only 43% of respondents experience high levels of satisfaction. Both these indices are disappointing in the high level of frustration and low level of satisfaction exhibited.

Each index was investigated in further detail to ascertain the contributing factors. The contributing factors to the Frustration Index are:

- insufficient computers available on campus;
- insufficient printing facilities available on campus;
- extent of technical difficulties experienced;
- insufficient support from the student CD-Rom;
- inadequate student training in WebCT;
- an impersonal learning experience;
- slow response from classmates;
- feelings of annoyance and/or stress.

The contributing factors to the Satisfaction Index are:

- feeling comfortable communicating via online tools;
- feeling more freedom to express oneself than in a traditional classroom;
- learning from the contributions of other students;
- promoting one's ability to work as a team or group member;
- promoting one's ability to plan one's own work;
- experiencing an enriching learning environment.

The interview schedule for the lecturer interviews was the Lecturer Experience and Satisfaction Questionnaire (Appendix E1). It emerged as a newly created instrument from the quality management system (see chapter 5), to contribute to comprehensive summative evaluation of web-supported courses. In the past, the only form of summative evaluation was student feedback.

The instrument was piloted with a small sample of 22 lecturers known to be active in WebCT. The data were analysed separately with respect to closed and open questions. The closed questions yielded very positive findings. There is strong agreement that the e-learning component adds value to the learning experience for students and that the excellent service from the Department of TLEI is valued by the respondents.

In the spirit of collecting rich and valid qualitative data, as much information as possible was recorded in response to open questions. These questions probed problems and benefits experienced with respect to the design and development of web-supported courses, as well as in facilitating and presenting online modules. Many of the respondents use web-supported learning on the level of information sharing, but they are aware of the benefits of facilitating learning in deeper and more interactive ways.

A source of frustration for lecturers was the extent of the upgrades to the IT infrastructure which occurred at the beginning of 2004. This led to a sense of insecurity with regard to technical reliability and technical support.

Staff and student training were mentioned as vital to ensuring the quality and success of web-supported learning. Online communication and interaction are recognised as providing benefits in the teaching and learning situation, but organisational and administrative advantages are more practical and quicker to achieve. Several responses reflected the difficulties with respect to the human element – getting the commitment of lecturers and motivating and encouraging students to participate in web-supported learning.

Suggestions were made in this chapter to refine the Lecturer Experience and Satisfaction Questionnaire for future administrations thereof. It will be reduced to three instead of four pages and the questions regarding the use of electronic tools will be clarified. It is recommended that the survey should be implemented in the interests of summative evaluation with all lecturers in annual project review and planning meetings.

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To solve a problem, the first step is to identify where it lies. This analysis has identified a number of problems in the web-supported service provision to students and lecturers at the University of Pretoria. In order for the University to realise its claim of internationally recognised and top quality education provision, the client voice in respect of web-supported courses must be heard and acted upon. Besides improving service to clients, this would contribute to a future impact study to provide evidence of return on investment.