

## CHAPTER 6 PROTOTYPE EVALUATION

### 6.1 Introduction

The Windows 2000 Professional prototype was tested with a group of 49 students taking the Operating Systems course at the Bioinformatic program at Institute of Biological Sciences at University of Malaya. These students were asked to use and navigate the Windows 2000 Professional courseware so that they are able to answer the questions in the questionnaires given. The whole process went on for about 3 hours. The same set of questions that were used for the evaluation of six educational systems in this courseware was given to these students to evaluate the prototype. However, since the lessons in Windows 2000 Professional prototype follow the socio-constructivism way of learning, there were some added questions to determine whether the students could agree with the socio-constructivist way of learning. These questions are displayed in Table 6.1.

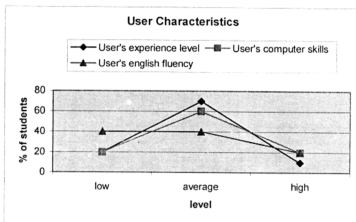
<b>Category : <i>Socio-constructivism learning strategy</i></b>	
<b><i>Answer YES/NO for the following questions.</i></b>	
Could you agree with the structure of course where problem solving, higher order thinking skills and deep understanding are emphasized?	
The lesson structure stresses on knowledge construction rather than knowledge "telling". Do you prefer it this way?	
Does this courseware help you recall your previous knowledge on the related topic?	
Are you able to do self-assessment after using this courseware?	

**Table 6.1 - Questions for evaluation of prototype**

## 6.2 Statistical Analysis and Discussion of Evaluation Results

### 6.2.1 User Characteristics

#### 6.2.1.1 Results



Graph 6-1 - User Characteristics

#### 6.2.1.2 Analysis

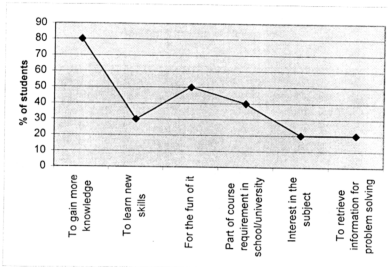
As we can see the Graph 6.1 above, most students have average level of experience, computer skill and English proficiency.

#### 6.2.1.3 Discussion

The Windows 2000 Professional courseware has been developed to accommodate novices and contains simple and straightforward contents, which would not give problems to the less experienced students. Besides that, the contents are written in Bahasa Malaysia as the evaluations in Chapter 4 proved that courseware in Bahasa Malaysia is more accepted than English courseware (Graph 4.3).

## 6.2.2 Goal/Task Characteristics

### 6.2.2.1 Results



Graph 6-2 - Goal/Task Characteristics

### 6.2.2.2 Analysis

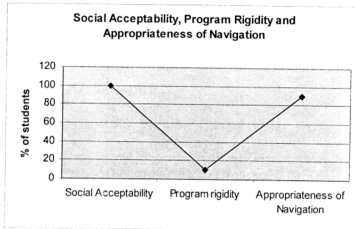
From Graph 6.2, we could conclude that, for most of the students (80%), the main motivation or goal to use the Windows 2000 Professional Courseware is to gain more knowledge. However only 50% uses it for fun.

### 6.2.2.3 Discussion

From the analysis, we could conclude that students seem to have a clearer idea on the motivation or goal of using the Windows 2000 Professional courseware. This is because, at the beginning of the courseware, the objectives were well stated so that students are aware of what they should achieve after using this courseware. This would help the students derive their own goals.

### 6.2.3 Social Acceptability, Program Rigidity and Appropriateness of Navigation

#### 6.2.3.1 Results



Graph 6-3 - Social Acceptability, Program Rigidity and Appropriateness of Navigation

#### 6.2.3.2 Analysis

The Windows 2000 courseware is accepted by all the students evaluated it. Only 10% of the students evaluated this courseware finds it to be a bit rigid. 90% of the students agree that the navigation in this prototype is appropriate. They do not have navigation problems using this courseware.

#### 6.2.3.3 Discussion

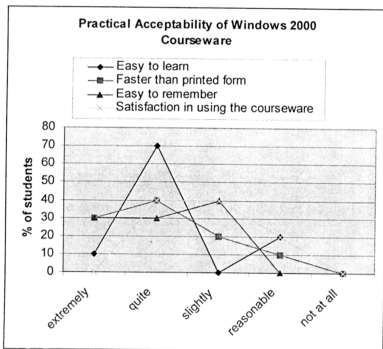
Since only a small number of the students complained about this courseware as being rigid, it can be considered as flexible enough for most students and therefore, students need very little prior knowledge in the field of study.



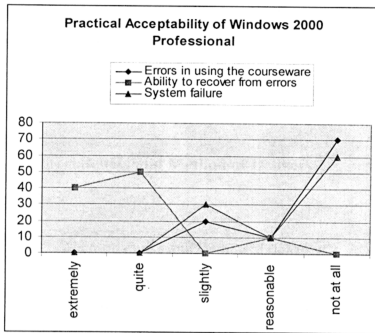
The navigation has been made simple and straightforward so that users could concentrate on learning rather than getting frustrated trying to get to the right page. In each page, a directory to show users path have been defined to help users know where they are. Therefore, they would not get lost in this courseware.

## 6.2.4 Practical Acceptability

### 6.2.4.1 Results



Graph 6-4a - Practical Acceptability



Graph 6.4b - Practical Acceptability

#### 6.2.4.2 Analysis

From Graph 6.4a and Graph 6.4b, we could conclude that 70% of the students feel that it is quite easy to learn, 40% agree that it is quite fast than printed form. 30 % say that it is extremely, 30% more say it is quite and another 40% say it is slightly easy to remember. Most students are quite and slightly satisfied with this courseware 70% of the students agree that they do not make errors while using this Windows 2000 Professional courseware. Most of the students also agree that it is extremely and slightly easy to recover from errors. 60 % of the students agree that they do not encounter system failure.

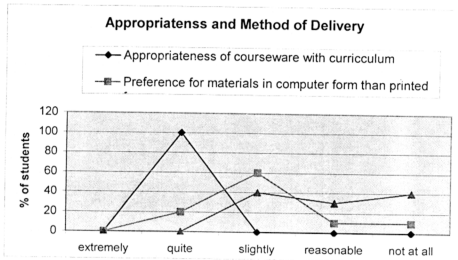
#### 6.2.4.3 Discussion

From the analysis of practical acceptability of the Windows 2000 Professional courseware, we could conclude that, this is more accepted compared to the six educational systems evaluated in this research. This is because, this courseware

contains standard layout that makes it easy to remember and learn. Students could get use to the system faster with the proper navigation and layout. Simple screens minimize error that is often encountered by students in most educational systems.

## 6.2.5 Appropriateness and Method of Delivery

### 6.2.5.1 Results



Graph 6-5 - Appropriateness and Method of Delivery

### 6.2.5.2 Analysis

Graph 6.5 shows that all the students feel the Windows 2000 Professional courseware is quite compatible with the curriculum in University. More than half of the students (60%) gave a neutral answer about having textbooks on online form of printed form. Most students disagree that they need instructions on using the courseware.

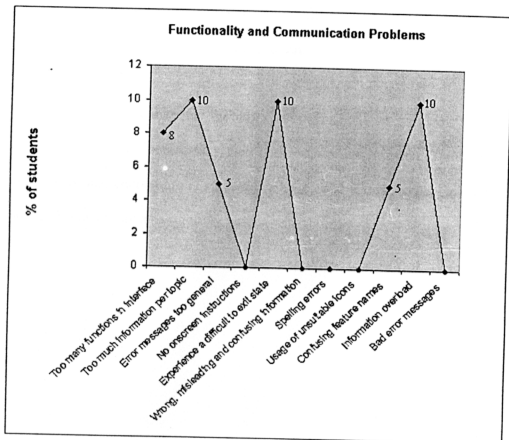
### 6.2.5.3 Discussion

This shows that this courseware is suitable for tertiary level and is compatible with the curriculum at the University and college level (Graph 6.5).

The results in Graph 6.5 show that students are fine with having the materials in an online form. The method of delivery of this courseware is based on constructivist approach, which is based on problem-based learning. Students are given adequate resources, exercises with sample answers and test, which is evaluated, by the system and also the expert. This makes the courseware more learner control than teacher-directed.

## 6.2.6 Functionality

### 6.2.6.1 Results



Graph 6.6 - Functionality and Communication Problems

### 6.2.6.2 Analysis

Graph 6.6 shows that 10% of the students noted that there is too much information per topic, only 8% commented that there are too many functions per interface and 5% said that the error messages are too general in this prototype.

Graph 6.6 also shows that there are only two prominent communication problems noted by only 10% of the students, which are experience a difficult to exit state and information overload.

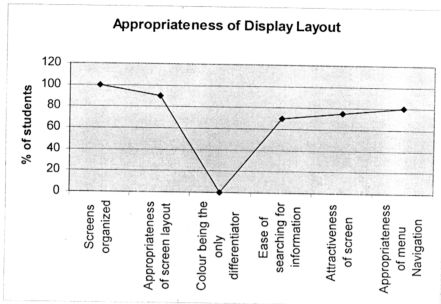
### 6.2.6.3 Discussion

Graph 6.6 shows that there is no major functionality problem in this prototype. It does not contain too many functions in one interface or too much information per topic. The error messages are also not too general.

Graph 6.6 also shows that the Windows 2000 Professional prototype has very minimized or does not contain any major communication problem. The Windows 2000 Professional courseware is regarded to have good feature names and suitable icons. The contents are also carefully written with simple and clear Bahasa Malaysia.

## 6.2.7 Display Layout

### 6.2.7.1 Results



Graph 6-7 - Display Layout

### 6.2.7.2 Analysis

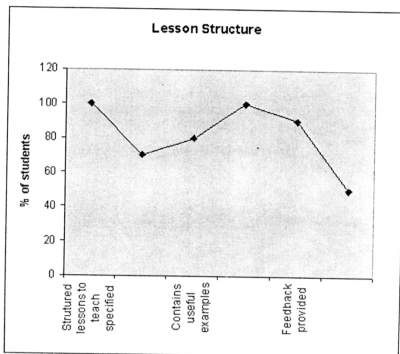
From Graph 6.7, we notice that all the students evaluated the Windows 2000 Professional courseware agrees that the screens are organized and balanced and the menu navigation is appropriate. 90% of the students feel that it easy to find what you want on the screens and the screens are attractive.

### 6.2.7.3 Discussion

Generally the screens in Windows 2000 Professional prototype are organized and balanced. The menu navigation is also very appropriate because students could move back and jump to any topic they want. There screens are also attractive to most of the students.

## 6.2.8 Lesson Structure

### 6.2.8.1 Results



Graph 6-8 - Lesson Structure

### 6.2.8.2 Analysis

Most students gave positive feedbacks on the lesson structure issues. All the students agree that there is a structured lesson to teach specified objectives. 70% feel that there is a detailed description on how to perform a specified skill is provided. 90% of the evaluators agree that the lessons contain useful examples. All students agree that there are enough exercises in the courseware and 90% agree that the feedback is provided for required response but only 60% feel that the feedback is explained in detail when appropriate.

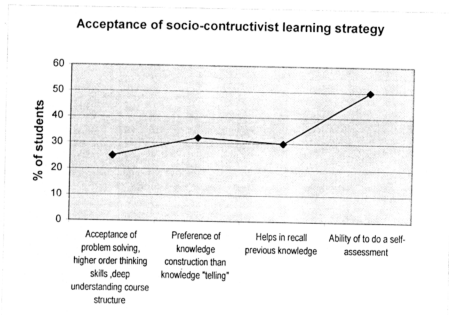


### 6.2.8.3 Discussion

The lessons in the Windows 2000 Professional courseware are designed carefully to meet the objectives stated in the course. However, some improvements must be made on providing with detailed description to perform a specified skill and also on the feedback. Feedback must be explained in more detail to satisfy the students.

### 6.2.9 Socio-constructivist learning strategy

#### 6.2.9.1 Results



Graph 6-9 - Acceptance of Socio-constructivist learning strategy

#### 6.2.9.2 Analysis

Graph 6.9 shows that only 25% of the students could accept problem solving, higher order thinking skills and deep understanding course structure. 32% prefers knowledge construction than knowledge "telling". 30% are able to recall their

previous knowledge with the courseware and half of the students (50%) agree that they could do a self-assessment with the courseware.

### 6.2.9.3 Discussion

The Graph 6.9 above shows that the socio-constructivist learning strategy is not very well adapted by the students in University of Malaya.

## 6.2.10 Students Overall Test Results In Windows 2000 Professional Courseware

### 6.2.10.1 Results

No	Matriks Number	System's marks	Evaluator's marks	Final Marks
1	SES000817	20	40	60
2	SES98542	10	30	40
3	SES000792	30	30	60
4	SES010016	10	10	20
5	SES010018	20	70	90
6	SES010022	30	65	95
7	SES000961	30	55	85
8	SES010028	30	50	80
9	SES98610	10	15	25
10	SES010058	10	10	20
11	SES010087	10	10	20
12	SES010134	30	65	95
13	SES001075	0	20	20
14	SES001061	20	40	60
15	SES010147	20	35	55
16	SES990066	20	20	40
17	SES000520	20	65	85
18	SES990631	20	55	75
19	SES010776	10	25	35
20	SES000529	10	15	25
21	SES010374	0	15	15
22	SES000892	10	15	25
23	SES010369	0	20	20
24	SES001123	30	60	90

25	SES001083	20	55	75
26	SES98596	30	65	95
27	SES001084	0	10	10
28	SES010325	10	15	25
29	SES010311	10	25	35
30	SES010258	10	20	30
31	SES010252	10	20	30
32	SES990661	20	35	55
33	SES000854	20	30	50
34	SES000661	20	50	70
35	SES000793	10	15	25
36	SES000518	20	55	75
37	SES010587	10	15	25
38	SES010567	30	60	90
39	SES010542	20	40	60
40	SES000663	10	30	40
41	SES010528	10	20	30
42	SES010502	30	50	80
43	SES010487	10	15	25
44	SES000857	30	35	65
45	SES000836	10	30	40
46	SES010692	20	25	45
47	SES010424	10	10	20
48	SES000463	10	10	20
49	SES001092	20	35	55
AVERAGE SCORE				49.5%

Table 6.2 - Students Test Results

### 6.2.10.2 Analysis

The Table 6.1 shows the test results of the students who evaluated the Windows 2000 Professional courseware. The final value shows that the student scored slightly below average (49.5%)

### 6.2.10.3 Discussion

The results show that the average results for all the students are below average. This could be due to the fact that the students could not accept the socio-constructivist way of learning.

## 6.3 Conclusion

Users have given more positive remarks on the Windows 2000 Professional courseware. This shows that, the requirements gathering in this research has improved the design of educational system suitable for the Malaysian learners.

However, the feedback on socio-constructivist learning strategy was quite negative. This is due to the students' mentality, which is still more towards the traditional way of learning, which uses the behaviorist learning strategy. (Chapter 2, Section 2.5)

A more detailed comparison of the results of survey on Windows 2000 Professional courseware and the six educational systems evaluated in Chapter 4 is discussed in the next chapter, which is Chapter 7.