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Use of the Virtual Class (VC) Application: A Survey among Students

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ABSTRAK

Kajian ini meneliti penggunaan aplikasi kelas maya oleh pelajar perakaunan di Fakulti Ekonomi dan Pengurusan (FEP). Dua isu utama yang dikaji adalah pola penggunaan oleh pelajar dan cadangan mereka untuk meningkatkan kebergunaan aplikasi bagi tujuan pembelajaran. Kajian menunjukkan bahawa di antara enam modul aplikasi kelas maya yang disediakan oleh FEP, modul "Tugasan dan Kuiz" adalah yang paling kerap digunakan oleh pelajar kursus Perakaunan Kewangan Pertengahan. Terdapat pelajar yang beranggapan aplikasi kelas maya sebagai memberi peluang untuk tidak hadir kuliah. Jangka masa yang diperlukan untuk mengakses aplikasi kelas maya dikatakan sebagai masalah utama dalam menggunakan aplikasi itu. Faedah utama menggunakan aplikasi kelas maya pula termasuklah keupayaannya untuk meningkatkan pengetahuan pelajar tentang sesuatu kursus dan juga membantu pelajar untuk berkomunikasi dengan pensyarah. Kebanyakan pelajar berpendapat aplikasi kelas maya perlu diluaskan kepada semua pensyarah di universiti. Cadangan untuk meningkatkan penggunaan aplikasi kelas maya termasuklah memperbaiki kemudahan komputer di kampus dan menyediakan nota yang lebih lengkap dalam aplikasi kelas maya.

ABSTRACT

This study investigates the use of the virtual class (VC) application by accounting students at the Faculty of Economics and Management (FEM). Two main issues examined are the pattern of usage by students and their suggestions to improve the usefulness of the application for their learning process. The study shows that among the six modules of the VC application offered at the FEM, the "Assignment and Quizzes" module was used most frequently by students in the Intermediate Accounting course. There were students who viewed the VC application as an opportunity to be absent from lectures. The length of time spent in accessing the VC application is cited as the main problem in using the application. The major benefits of using the VC application include its ability to enhance the students' knowledge of a course and assist students to communicate with lecturers. A majority of the students maintain that VC application should be extended to all lecturers in the university. Suggestions given to improve usage of VC application include improvement of on-campus facilities and provision of more complete sets of notes than currently available.

INTRODUCTION

This paper focuses on students' pattern of usage of the Virtual Class (VC) application in the context of the Salleh *et al.* (2000) paper. The perceived benefits and pitfalls of using the application are also examined.

The VC application here refers to the environment in which lectures in the traditional manner are supplemented with the use of the software application as offered on the server of the Faculty of Economics and Management (FEM), Universiti Putra Malaysia (UPM). As

pointed out by Salleh *et al.*, the rationale underlying the use of VC at the FEM is mainly to overcome the constraints of location and time for communication between a lecturer and his or her students, more specifically in reference to a course.

In essence, VC as applied in the FEM case, bridges the distance so that students can have access to a lecturer at any time and from any location outside the scheduled sessions of the physical classroom (Salleh et al. 2000, p. 2).

Initially, when the VC application was first introduced, access to the module by lecturers and student access to the database was only through the Lotus Notes application.

A more recent development of the FEM server is the availability of lecturers' homepages that provide links to the VC application. Through this form of Web-based sites, the modules in the VC application of courses offered as managed by individual lecturers can now be accessed by students from almost everywhere within and outside the UPM campus through the Intranet and Internet systems. Given the rising trend among lecturers at the FEM to popularise the use of the VC application in their teaching, it is useful to learn whether such efforts and determinism are reciprocated by students' actual usage of the application.

Each of the six modules made available to students in the VC application: Students Registration; Course Plan; Course Notes; News and Announcements; Assignments and Quizzes; and Discussions[1] is included to meet specific purposes. In this regard, it is equally useful to observe the usage pattern among the modules so that appropriate measures can be taken to encourage the use of the other non-used modules. Considering that the provision of each module means the use of space available on the system, a particular module that is perceived as not being useful perhaps can be deleted from the system or replaced with other new modules.

This study, being exploratory, limits its scope to the usage of the VC application among students who have completed the first course in accounting, the Introductory Accounting course offered during the first semester of the accounting programme.

Since the first time the VC application was made available to students, it has been a practice of the instructor of the course to provide hands-on sessions on the use of the VC application to students during the first two weeks of the semester. Attendance, however, was not made compulsory. As with any new computer software application, knowledge about the availability of the application alone cannot ensure that users are motivated to use it. In fact, in many innovation exercises, overcoming prejudices against the new product becomes fundamental. For this reason and for the reason that it may be the lack of knowledge of the application that results in students not using the application, the instructor adopts the above approach. Nevertheless, providing such exposure to students involves time and effort on the part of the instructor, especially when the number of students usually exceeds five hundred. Hence, focusing on the usage of the VC application by this group of students can, in some ways, indicate whether the hands-on sessions have indeed contributed towards their willingness to use the application. For instance, if students indicate that exposure to the application through other media can be equally effective, then the instructor needs no longer continue with the hands-on sessions at the beginning of every semester.

Incidentally, findings from the Salleh *et al.* (2000) study on usage of the VC application among lecturers also indicate that the level of usage at the FEM was highest in courses offered by the lecturers of the Accounting and Finance department. It thus becomes more interesting to determine the pattern of VC application usage among students pursuing courses offered by this department.

The accounting literature, especially according to Bryant and Hunton (2000), offers relatively little research on the pedagogical benefits of using technology to deliver instruction. In reviewing studies on distance education, they also noted that there has been a lack of research encompassing newer

1 Except for the Discussion Module, other modules are non-interactive and unidirectional and function like bulletin boards. The discussion module is bidirectional and provides an asynchrounous discussion template between students and lecturer.

technologies such as non-interactive and interactive web-based delivery even in other areas of education. Hence, it is hoped that this study can reduce the dearth of the literature on this issue particularly in respect of accounting education.

To summarise, this study reports the level of usage of the VC application by students at the FEM and the benefits and problems that they experienced while learning under the VC environment. The section that proceeds provides a summary of the review of relevant literature on the issue of education via a VC environment. Since literature on the use of the VC environment in the teaching and learning of accounting is minimal, related studies in business and management education were cited. Next, the method applied in this study is discussed, followed by a report of the findings. Finally, the implications of the results and the conclusion arrived at are reported.

Review of Relevant Literature

In their paper, Salleh *et al.* (2000) found that various definitions have been assigned to describe the teaching and learning environment in which technology is used as a medium for communication as opposed to the traditional classroom setting. Overall, there seems to be no consensus on the terminology to describe the VC phenomenon. Despite the lack of agreement on what the most appropriate term is, many studies have been conducted on various aspects of the issue.

In terms of the usefulness of the VC application, a review of literature shows that many researchers claim that this form of technology integration is able to assist student learning especially through creating additional and flexible access avenue to information (Bradley 1999, Fetterman 1998, Funnel *et al.* 1998). It must be stressed that it is never the intent of this paper to question the usefulness of the VC application in terms of its communication role. But it should be borne in mind that most of these claims were made from the perspective of instructors. In order to obtain a more complete picture of the electronic learning scenario including its benefits, the views of the students should not be ignored.

Among the limited studies that include students' feedback on electronic learning is the study by Clements (1999). The study analysed results of two surveys that solicited feedback from first year students at the beginning and end of the basic marketing course at the University of Staffordshire in which a virtual learning environment, the Lotus Learning Space (LLS) similar to the VC platform of the FEM, was introduced in September 1998. Among other things, analysis of the results of the initial survey indicates that students were not necessarily prepared to work in a VC environment upon entry into university. Only about 87 respondents (20% of the population of 434) indicated that they were familiar with virtual group discussion although about 51% had searched the Web. About 76% of the respondents were worried about the new delivery method and thought that a traditional approach would be better.

These findings led Clements to conclude that structured guidance and hands-on practice have to be built into the course design especially in the induction period, a view also shared by Symons and Galpin (1998) and the lecturer of the Introductory Accounting course at UPM, among others. The end survey in Clements' (1999) study, though showing a marked improvement in the level of competency of the LLS application, still suggests that much more effort has to be expended into making it work. Only about 50% of the respondents indicated that they used the Group Discussion module.

Pybus and Sanderson (1999) carried out a pilot study to examine the potential of LLS to support distance teaching and learning of the BA in Business Management programme offered in October 1998 at the Nottingham Business School. The structure of the programme is such that students are required to be full-time students during their first year of study prior to the subsequent years of distance learning. It was during the full-time term that students were given familiarity sessions that included hands-on experience with the various modules of the software application. Concentrating especially on the discussion module or more specifically, the Course Room, Pybus and Sanderson discovered that the pattern of students' participation was influenced by the topic of discussion similar to the pattern described by Grudin (1994). Students' enthusiasm was found to be very high initially when all the twenty students in the BA in Business Management programme participated in the first electronic discussion on non-specific subject topics. Altogether, 120

comments were generated within a twenty-minute discussion session. Later, when the focus was changed to discussion of study-related topics, far fewer students contributed to the discussion.

Pybus and Sanderson next tried out, among others, a highly structured debate on the LLS. This time, students were given a week to research, reflect and prepare their initial posting so as to increase their confidence in contributing to the on-line discussion. Two topics were to be debated between four teams with two each debating on one particular topic. Each team debating a topic simultaneously made its first posting and then read that of their opposition. A response was required after 15 minutes. Next, the teams switched their attention to the other debate and all teams were invited to vote, giving a short explanation of which arguments had persuaded them. All students had access to the results of the vote. Feedback from students on this interesting experiment indicated that all of them enjoyed exploring a topic in this way. According to them, the highly structured nature of the on-line debate was useful in encouraging their contributions, they knew exactly what was required of them and it was easy to navigate. Based on the students' response, the conclusion the researchers made was that a VC environment as offered via the LLS can be a useful platform for distance education of the BA in a Business Management programme.

A more recent study on students' perception of the LLS was carried out by Arbaugh (2000) at the graduate management education level. In the study, among others, responses measured on a 7-point Likert-type scale on relevant VC learning issues were sought from a total of 108 students pursuing five Masters in Business Administration (MBA) courses. Only five students were enrolled in two of the courses while the rest had only one course each. Each course in the study was administered via its respective LLS Web site that provided a combination of the non-interactive "notice boards" and interactive discussion platforms, similar to the LLS of the above two studies by Clements (1999) and Pybus and Sanderson (1999) and the VC of the FEM. Except for one course (Course 2) that had half of its sessions conducted in a traditional manner, all other courses were conducted fully on the electronic medium. Within these four courses, three had on-site opening and wrap-up sessions while one had no physical meeting at all.

Among the findings of Arbaugh's (2000) study was that there were significant differences between the courses in ratings of perceived ease of use of the software. Additionally, the flexibility of the medium of instruction (VC application) and the ability to develop an interactive course environment were found to play a larger role in determining student satisfaction with the VC learning environment than the ease or frequency with which the medium can be used.

In another study of VC usage but within a pilot Intranet system at Brighton Business School in 1997/98 by Flowers *et al.* (1999), students initially viewed the provision of lecture materials as a diminution of the role of academics as providers of information and saw potential opportunities for the avoidance of attendance at lectures. Only with extensive and repeated discussions did students realise that the content or lecture slides play an important but only minor role in the lecture, hence, student education process. It is the lecturer who can help interpret, synthesise and map out the topology of a discipline as well as introduce students to the specialised language of a discipline area. Analysis of students'[2] usage of the VC application shows that the Discussion module and Social Chat Areas were largely ignored. The most heavily-used modules were those related to lecture notes/slides, past examination papers and module-specific websites.

The popularity of the VC application modules relating to lecture notes or slides among students was also demonstrated in the study by Collett *et al.* (1999). Nearly half of the student respondents in their study of the usage of the VC application within an Intranet system at the University of the West of England (UWE), Bristol used the Lecture Overheads module every week. However, more than a third of the respondents never accessed any module of the VC application at all, including the Course Outline, Assignment and Examination Papers modules. Unlike at the

2 Although the system was initiated during the beginning of the 1997/98 academic year, by the time it was implemented, it was a different batch of students who had the oppurtinity to use the application during the second half-year.

VC application of FEM, however, no discussion platform was made available within the VC environment of the UWE.

Fong (1999) investigated the perception of students in the Accounting Studies programme on the VC environment at the City University, Hong Kong, offered through the World-Wide-Web Course Tools (WebCT) application developed by the University of British Columbia. Although two surveys were meant to be conducted, first during the first few weeks of the semester and later approaching the end of the 14-week semester, his report covers only results of the initial survey. Unlike the findings in the initial study by Clements (1999) where the majority of the students were apprehensive about the usefulness of the electronic delivery platform, Fong found that students generally perceived the WebCT to be better than traditional course delivery methods. However students' acceptance of web-based course deliveries was found to be significantly influenced by accessibility to Internet-connected computers at home or in the office.

From the review of literature above, it appears that some modules within the VC applications such as those related to lecture notes and slides seem to be more popular than others. Equally, the pattern of usage of the VC application differs between the studies. Students' perception of the usefulness of the VC application in supporting their studies also appears to differ. With the above findings in respect to other studies, it would be interesting to observe what the pattern of usage of the VC application is by accounting students at UPM and what their perceptions are of the benefits and impediments of the VC application.

RESEARCH METHOD

Data for this study were collected from students in the Intermediate Financial Accounting I class during the second half of the May 1999/2000 semester. This group of students had completed the Introductory Accounting course during the preceding semester, in which all were provided with the opportunity to attend the hands-on sessions provided earlier by the instructor of that course.

Questionnaires were distributed during one of the lecture sessions when 89 out of 120 students were present. Information sought in the questionnaires can be categorised into four main parts:

I) background information on computer usage in general;
II) specific information on actual usage of VC application during the preceding and current semesters;
III) information on the benefits enjoyed and problems encountered in using the VC application; and
IV) students' suggestions on how to improve the usefulness of the VC application.

With the exception of the questions on the access to and frequency of using computer facilities and the VC application (results indicated in Tables 1, 5, 6, and 8), multiple responses were allowed for all questions.

With the intention of this study being to observe the general pattern of usage of the VC application, including the perceived benefits and problems as opposed to establishing relationships between variables, data solicited from the questionnaire survey were analysed descriptively.

RESULTS AND DISCUSSION

This section provides a report of the results and a discussion of the related issues in four parts in accordance to the research questions above.

General Computer Usage

Table 1 shows the source of computer facilities generally used by students. It also provides information on students' ownership of computers. As can be seen below, slightly more than a third of the respondents own computers. Between those who indicated that they did not have access to personal computer facilities, more than half (33 out of 57) used other private facilities outside the university while the remaining used the facilities on campus.

The above findings provide an interesting disposition to the usually held perception about

TABLE 1
Access to computer facilities

Source	Frequency	Percentage
Own/personal facilities	32	36.0
Other private outside facilities	33	37.0
University facilities	24	27.0

students' willingness to use computers in relation to the facilities available at institutions of higher learning. For instance, in the study by Salleh *et al.* (2000), some lecturers perceived that lack of computer facilities at institutions of higher learning might have a negative influence on students' willingness to use computers, including the VC application, hence lecturers were reluctant to use the application themselves.

But responses in this study show that students do not rely totally on on-campus facilities. The situation could be that students used other facilities than on-campus because they prefer to do so. On the contrary, another possible reason why students who did not own computers resorted to other facilities off-campus could be because of the lack of facilities on campus itself. Due to the inconvenience of having to get access to on-campus facilities, students took the initiative to look for other sources. Whether the facilities available on campus are seen by students as adequate or not, only analysis of other relevant questions can show.

For students who used computer facilities on campus, Table 2 lists the locations where they accessed the facilities. A point to note with this question is that, as indicated above, students were allowed to provide more than one response. This means that total frequency need not make up 24, that is, the total number of respondents who used on-campus facilities.

TABLE 2
Locations of on-campus computer facilities accessed by students

Location	Frequency (multiple responses)	Percentage of total responses
The Computer Centre	4	5.2
Faculty laboratory	7	9.1
Library	2	2.6
Residential Colleges	12	15.6
On-campus "Cyber Cafes"	50	64.9
Others	2	2.6

Responses to this question indicate that on-campus "Cyber Cafes" appear the most popular sites where students used computers. Despite the Computer Centre and individual faculties allowing students to use their computer facilities, these two sites appear not to be popular among students. Rather, the facilities at the residential colleges appear more used by the students. The library appears as the least-used site for computer access by students who do not have access to personal or other private computer facilities. Given that the questionnaires did not seek information on reasons for preferences for each site, it is unwise to speculate on why, for instance, students prefer the "Cyber Cafes" facilities to the Computer Centre or faculty laboratories despite having to pay for using the facilities at the "Cyber Cafes". The "Other" category consists of access to friends' computers on campus. As with the facilities at the library, not many students accessed computers in this manner.

During the first year of studies, students who registered for the Accounting, Accounting with Education, Business Administration and Economics programmes at the FEM were required to take the Computer and Data Processing course. This is to ensure that all students are familiar with computers and can appreciate how computers can assist their work whether as students or in future work environments. In this course, various computer software packages were introduced, including the spreadsheet, word processing, statistical packages and the use of the Internet facilities. Therefore, apart from questions on access to computers, a question on the types of software packages used by students was also included in the questionnaire. However, the use of VC application software is excluded here, since a question specifically on the issue is asked separately. Results on the use of the selected type of software packages are shown in Table 3.

TABLE 3
Use of computer software

Software	Frequency (multiple responses)	Percentage of total responses
Word processing	88	25.3
Spreadsheet	68	19.5
Statistical package	35	10.1
Internet (surfing web sites)	79	22.7
E-mail	78	22.4

As with responses to the question on location of computer facilities accessed by students, students were also allowed multiple responses to the question on the software packages used.

This is in view of the high probability that an individual student will use more than one type of software package.

From Table 3, word processing software appears to be widely used by the respondents with 88 of the students indicating so. Salleh and Williams (1997) observed a similar pattern when they surveyed the use of computers among Malaysian public universities. In their study, all the public universities in Malaysia surveyed at that time indicated that students were encouraged to prepare assignments using word processing facilities rather than submitting hand or typewritten scripts, hence word processing packages were widely used. The next most popular software among the packages used during the students' first year was for accessing the Internet, very closely followed by e-mailing software. Statistical packages were not widely used by the respondents. Given that Table 3 reflects usage of software during the first two semesters of study when students do not usually conduct research, it is not surprising that the level of usage of statistical packages is the lowest.

Another question included in the questionnaire survey is about the person whom students refer to when they faced problems related to computer use. Responses to this question are depicted in Table 4. Again, as with earlier questions, multiple responses to the category of persons are allowed.

TABLE 4
Category of reference person for help

Category	Frequency (multiple responses)	Percentage of total responses
Lecturer	1	1.1
Laboratory technician	1	1.1
Demonstrator of lab. session	3	3.2
Staff of "Cyber Cafes"	16	17.2
Friends	72	77.4
Nobody	0	0

From Table 4, it can be seen that students tend to refer to their friends for assistance when they need help regarding computer usage. Interestingly, students hardly refer to their lecturers or laboratory technicians or even laboratory demonstrators when they face difficulties with using computers. Rather, staff of "Cyber Cafes" tend to be more referred to as indicated by the results in Table 4. Given that most students who used on-campus facilities did so at "Cyber Cafes" perhaps it became most convenient for them to refer to the staff there rather than to wait until they met the lecturers or laboratory technicians or demonstrators. Another interesting finding depicted in Table 4 is that students always refer to someone whenever they face problems. This is indicated by the "zero" response to the "Nobody" category. Such an attitude of the students should be interpreted positively for it means that they do make an effort to consult someone when faced with difficulties although it could be only their friends who might know no more than they do.

Prior to providing responses to questions on the VC application usage during their first year, students were required to answer a question on the frequency of computer usage before attending the Introductory Accounting course. The purpose of the question was to seek an indication of the level of comfort of computer usage among students. Presumably, the more frequently a student uses the computer, the less likely it is that he or she is apprehensive about continued usage in the future.

Responses to the question on the frequency of usage of computers are shown in Table 5.

TABLE 5
Frequency of computer usage

Duration	Frequency	Percentage
More than once a day	6	6.7
About once a day	17	19.1
About once a week	38	42.7
Hardly ever	27	30.3
Never	1	1.1

Generally, more than a third of the respondents used computers about once a week prior to attending the Introductory Accounting course, in other words, prior to attending a hands-on session of VC usage and actual accessing of the VC application. It is worth noting that about 30% hardly used computers while 1% never used computers at all. Only about a quarter of them in total used computers every day. Given a generally low level of usage among students prior to being exposed to the VC application, it is interesting to observe the pattern of VC usage after that.

Usage of the VC application

The first question in this section acts as a check on students' knowledge of the way to access the VC application. Having attended the hands-on session at the beginning of the earlier semester during the Introductory Accounting course, the students were presumed to have acquired the knowledge to access the VC application. Nevertheless, from Table 6 below, about 2% of the respondents indicated that they did not know how to access the VC application.

TABLE 6
Knowledge on how to access the VC application

Response	Frequency	Percentage
Yes	87	97.8
No	2	2.2

Given that attendance during the hands-on sessions was not made compulsory, some students might not have attended the classes in the first place. Or, perhaps, even if they had attended the training sessions, they might not have learned or remembered what was taught.

To seek further indication on the effectiveness of the sessions, another question on the issue was posed in the questionnaire to the students. However, rather than asking for a direct response on whether the hands-on sessions had been effective or otherwise, students were required to indicate from whom they had learned to access the VC application. The idea of such a question is that if the majority of the students indicate that they learned to access the VC application from sources other than their lecturer, then hands-on sessions as conducted by the lecturer of the Introductory Accounting course need no longer be continued. Responses (multiple allowed) to this question from the 87 students who knew how to use the VC application are shown in Table 7.

TABLE 7
Source of knowledge on how to access the VC application

Source	Frequency (multiple responses)	Percentage of total responses
Lecturer (Introductory Acc.)	62	64.6
Laboratory technician	0	0
Demonstrator of lab. session	1	1.0
Staff of "Cyber Cafes"	0	0
Friends	28	29.2
Self-taught	2	2.1
Others (not specified)	3	3.1

As indicated in Table 7, the "Lecturer" category received the most number of responses. This implies that the majority of the respondents who had used the VC application learned to use the application during the hands-on sessions although there were some students who learned from their peers; from a laboratory demonstrator; from others as well as a few who were self-taught. Unlike the results in Table 4 where some students indicated that they referred to staff of "Cyber Cafes" when they had difficulty with computer usage, no student learned to access the VC application from staff of "Cyber Cafes".

In terms of the frequency of usage of the VC application by modules, Table 8 provides the results of responses by students who knew how to access the VC application only. This is because the two students who indicated that they did not know how to use the application also indicated that they did not use the application. Logically, one will not be able to use a software package if one does not know how to use it.

TABLE 8
Frequency of VC application by modules

Frequency of Usage	VC Module used				
	Stud. Reg.	Assign. & Quizzes	News & Announ.	Course Plan & Notes	Disc.
Everyday	1	0	0	0	0
Once a week	2	13	11	7	6
Once a fortnight	2	20	14	13	6
<Once a fortnight	33	45	40	47	24
Never	49	9	22	20	51

From Table 8, it can be seen that among the six modules on the VC application at FEM, the "Assignment and Quizzes" module appears as the most referred to by students; more than a third of the respondents (33 out of 87) accessed it at least once a fortnight. Usage of this module surpassed that of the "News and Announcements" module (25 out of 87 or about 29%) although logically students should access the "News and Announcements" module as frequently as possible, preferably every day, in order to find out about the latest announcement on a course.

Interestingly, the modules regarding lecture plans and notes/slides which were represented in the questionnaire under "Course Plan and Notes" rather than separately were third in terms of frequency of access by students. Although these modules represent the contents of the course, the findings in this study are unlike those of Flowers *et al.* (1999) and Collett *et al.* (1999) where the modules related to course notes or slides were found to be used most by students. A browse of the actual contents of lecturers' "Course Notes" module during the May 1999/2000 semester revealed that most of the contents did not provide full lecture notes but various topic headings and sub-topics. Perhaps, students would find the "Course Notes" module more beneficial if full sets of notes were to be provided. It would be interesting to find out whether students had indicated that the benefits of VC could be increased if full sets of notes were provided. This is an issue to be discussed later from answers to the question on how to improve the usefulness of the VC application.

Pybus & Sanderson's (1999) study shows that students perceived that the use of the discussion platform has positive implications on their learning. Yet in this survey, the "Discussion" module was found not to be used as frequently as the other modules except for "Student Register". Nearly 60% never accessed the "Discussion" platform at all, quite similar to the findings by Flowers *et al.* (1999) where the module was found largely ignored by students. According to Doob (1995), research shows that students achieve more by participating in study groups out of class. The use of the discussion platform of the VC application at FEM should therefore be encouraged given the positive influence it could have on students' learning. One way to encourage the use of this module is perhaps to integrate some assignments into the module innovatively as was done by Pybus and Sanderson.

The "Student Register" module is a platform which provides on-line registration to students. At the same time, this module can serve as the record book where lecturers can post students marks for all assignments. In the study by Salleh *et al.* (2000), the "Student Register" was found to be the least-used module by lecturers. It is this module, too, that is found in this study to be the least frequently accessed by students, with only 5 of them accessing it at least once a fortnight. This is despite the fact that students in the Intermediate Financial Accounting I course were required to register their names through the "Students Register" module during the first two weeks of the May 1999/2000 semester. And indeed, all students did have their names registered. Yet, more than half of the respondents in this study indicated that they never used this application. An implication of the findings above is that their names were most probably keyed in by someone else, most probably their course mates. Another reason why this module did not appear popular with students could be because the lecturers hardly used this module to paste students' results over the semester. Thus, students might not see it beneficial to access this module.

Problems and Benefits in Using the VC Application

On the questions of problems faced while using the VC application and the benefits experienced from using it, the responses of students who used the VC application are as tabled in Tables 9 and 10. Although students were asked to list problems and benefits other than those proposed in the questions, only one other problem and benefit each was stated. Both of these responses (other problem and benefit) are listed last in Tables 9 and 10.

From Table 9, the main problem that students faced while using the VC application appears to be related to the time spent in accessing the VC application with 35 students indicating so. Problem of accessing, however, is not specific to the VC application software but more related to the connection between the students' terminals and the server. Given that a few parties are involved in the enabling of an on-line communication such as the network

TABLE 9
Problems faced while using the VC application

Types of problems	Frequency (multiple responses)	Percentage of total responses
Time consuming to access virtual class	35	35.7
Unavailability of printers	20	20.4
Difficulty in getting help when needed	27	
Lack of understanding of instructions given on computer	9	9.2
No problem	6	6.1
Difficulty in getting access to computer	1	1.0

provider and telecommunication companies whose policies and actions are beyond the control of a lecturer using the VC application, there appears little that an individual lecturer can do to improve the situation. As highlighted in the study by Salleh *et al.* (2000), the use of technology, especially new versions may be accompanied by some breakdowns of that technology. Perhaps, students should anticipate the problem relating to access time and develop strategies to reduce such impact. One possible way is to attempt to access the VC application during off-peak periods.

Other problems while using the VC application include difficulty in getting assistance when faced with difficulty and unavailability of printers. With respect to the former, it can be a frustrating endeavour for students who could not proceed with using the VC application if they could not consult anyone for help while accessing the application. On this issue, students were recommended to use the PCs at various laboratories to minimise such incidences. However, given that most students were found not to use on-campus facilities (Table 1), it is not surprising that assistance could not be sought when they faced difficulty relating to usage of the application.

The other problem of non-availability of printers, although it may appear insignificant to some, can have some bearing in situations where students are expected to download for hard copies. An example is the "Assignments and Quizzes" module where students are usually not provided with hard copies but expected to obtain the copies themselves. Absence of printers can be a nuisance. But this is a problem that can be easily solved. Students can always save into floppies to be printed elsewhere. Nevertheless, availability of printers for this purpose can help reduce the inconvenience.

Although there were students who had the problem of not understanding the instructions on the computer screen, the proportion is minimal. There were also a few students who had not experienced any problem at all. Interestingly, the problem of not getting access to a computer was only cited once.

With regard to the benefits that students identified from their experience of using the VC application, Table 10 reveals that among the main benefits of using the VC application is that it can enhance students' knowledge of a course (with 54 students identifying this as among the benefits). This is not surprising given that the VC platform is specifically designed to provide information on a particular course.

The other benefit is in terms of its role to assist communication. The VC application is said to help students communicate with their lecturers. This ability is especially handy in circumstances where lecturers' time to meet students does not coincide with that of students'. Inability to have face-to-face meetings with lecturers due to the above need no longer mean that students do not get access to lecturers. Rather, with the usage of the VC application, communication between lecturers and students

TABLE 10
Benefits from using the VC application

Types of benefits	Frequency (multiple responses)	Percentage of total responses
Enhancement of knowledge on a course	54	28.3
Help to communicate with busy lecturers	48	25.1
Reduction of necessity to face lecturers	43	22.5
Ease of communication with lecturers from students' various localities	45	23.6
No benefit	0	0
Access to up-to-date information such as changes in examination dates	1	0.5

can be effected wherever students are and whenever they desire so. For some students who are by nature apprehensive about meeting lecturers, they see the above as another benefit of VC. Related to its communication role, the VC is also said to assist students keep themselves informed of the latest changes or updates regarding a course. Although cited only once, the benefit listed last in Table 10 was also cited by lecturers in the study by Salleh *et al.* (2000). However in that study, the benefit was seen from the perspective of the lecturers who used the VC application where the VC application was said to assist lecturers disseminate information quickly to students.

Having given thought to the problems and benefits that they experienced in using the VC application, students then responded to the question of whether all lecturers at the university should integrate the VC application in their teaching of a particular course. This question was asked of all students regardless of whether they had used the VC application or not. Students were also required to provide their own reasons for selecting either the "yes" or "no" answer. Responses to the question of whether all lecturers at UPM should use the VC application are as those found in Table 11 while their reasons for selecting a particular answer, are in Tables 12 and 13. A point worth noting is that some students from both groups ("yes" and "no") provided more than one reason for preferring or not preferring to see the use of the VC extended to all lecturers.

TABLE 11
Should all UPM lecturers integrate the VC application in their course?

Response	Frequency	Percentage
Yes	74*	83.1
No	15	16.9

* includes the two students who did not use the VC application

The inclusion of the question on the justification for recommending or non-recommending usage of the VC application by all lecturers at the university may appear repetitive given that students were earlier questioned on the benefits and problems of using the VC application. This, however, is not the case for it should be borne in mind that the earlier question on the benefits and problems were answered only by those who used the VC application whereas the question on the justification was answered by all students. This implies that although a student may not use the VC application (although only 2) he or she may feel that all lecturers should use the VC application as a result of experiencing some form of difficulties or for reasons learned from peers' experience. In this respect, it is interesting to observe, in particular, the response by the two students who did not use the VC application.

TABLE 12
Reasons why all lecturers should use the VC application

Reasons	Frequency (multiple responses)	Percentage of total responses
Easier to refer to announcement	13	13.8
Easier to obtain tutorial questions	4	4.3
Easier to obtain lecture notes	8	8.5
Saves time	8	8.5
Enhances IT skills	5	5.3
Facilitates learning	11	11.7
Easier to contact lecturers	29*	30.9
Need not go to lecture	3	3.2
No response	13	13.8

*includes responses from the two students who did not use the VC application

TABLE 13
Reasons why all lecturers should not use the VC application

Reasons	Frequency (multiple responses)	Percentage of total responses
Facilities inadequacy	7	41.2
No printer	1	5.8
Time consuming to access VC	2	11.8
Costly to access	2	11.8
Dislike VC	1	5.8
Face to face meeting is important for the lecturer to understand students' problem	2	11.8
No response	2	11.8

Table 11 reveals that more than eighty percent of the respondents (74 out of 89 students) would like to see all lecturers in UPM use the VC application. Students in this category include the two who did not use the VC application.

Moving on to the reasons for their recommending that all lecturers use the VC application, from Table 12, it can be observed that, generally, again, the communication role of the VC environment appears the main reason why students perceived that it should be used. This too, was the reason given by the two students who did not use the VC application. Perhaps, by not using the VC application, they experienced difficulty in communicating with their lecturers or perhaps they perceived so after comparing notes with their peers.

Some other students felt that it should be used as it could facilitate their learning and enhance their IT skills. Only 3 students looked at the VC application as a means of not attending classes or opportunity to stay away from lectures. Although relatively minimal (only 3 students), there were students who did perceive the VC application as an opportunity to abstain from lectures, similar to some students in the initial survey of the Flowers *et al.* (1999) study. Some 13 other students did not provide justification for wanting all lecturers to use the VC application.

Among the 15 students who believed that the VC application need not be extended to all lecturers at the university, the main reason for their not preferring so was because of the difficulty of getting access to computers although one student indicated that it was for difficulty in getting access to printers. Given that more than a third of the students were found to have access to personal and private computer facilities as shown in Table 1, and that lack of computer facilities was cited by only one respondent as a problem faced in using the VC application (Table 9), perhaps, this reason may not appear strong enough for not wanting to extend the use of the application to other lecturers.

A few students also perceived that since the use of the VC application was time-consuming and costly, the use of the VC should not be extended to other lecturers at the university. One student appeared to have a negative attitude towards the VC application and so believed that because of his dislike to the VC application, all lecturers should not use it. Another two respondents suggested that the VC application should not be used by all lecturers because they (the students) believed that lecturers should meet students face-to-face to be able to understand students' problems better. With regard to this issue, it must be remembered that the FEM has always insisted that the use of the VC application is not a replacement for lectures or meeting students face-to-face. It is to be used as a complement to the traditional teaching approach. Two students did not provide reasons for not wanting the VC application to be used by all lecturers.

Having provided a discussion of the benefits, problems and reasons for/against suggesting an extended usage of the VC application to other lecturers at the university, this paper examines students' suggestions on how to improve the usefulness of the VC application in the next section. In the light of the pattern of usage of the VC application modules as depicted in Table 8, especially that of a non-frequent usage of modules relating to course notes and slides, students' suggestions on ways to improve the application become more interesting.

Suggestions on How to Improve the Usefulness of the VC Application

As shown in Table 14, 26 students did not provide any suggestion on how to improve the usefulness of the VC application. Out of the remaining 63 students, 74 suggestions were obtained indicating that some students provided more than one suggestion. Table 14 consists of two parts:

A: suggestions of measures viewed as able to improve the usefulness of the VC application by students who actually know how to use and who actually used the application and

B: suggestions by those who did not know how to use and did not actually use the application.

From the suggestions in Table 14A, most (21 out of 63) students indicated that the VC application would be more useful to them if lecturers were to provide more complete sets of lecture notes. In some ways, this implies that students still have the perception that the VC application should replace lectures. Given that the philosophy for the usage of the VC application at FEM is to supplement rather than

TABLE 14A
Suggestions on how to improve the usefulness of the VC application (by students who used the VC application)

Reasons	Frequency	Percentage of total responses
No suggestion	26	26.5
Include more complete notes	21	21.5
Increase computer facilities at FEM	17	17.4
Make compulsory the use of VC in all courses	6	6.1
Update information on VC application regularly	5	5.1
Increase speed of access	4	4.1
Make VC application more interesting	4	4.1
Introduce and train students to use VC	3	3.1
Students take initiative to learn to use VC	3	3.1
Introduce and train students to use VC earlier	2	2.0
Include model questions and answers	2	2.0
Others	5	5.0

TABLE 14B
Suggestions on how to improve the usefulness of the VC application by students who did not use the VC application

Reasons	Frequency	Percentage
Increase computer facilities on campus	1	50.0
UPM subsidises students' purchase of computers	1	50.0

supplant lectures, perhaps it has to be emphasised further and extensively, too, to the students that it is the lecturer who can help interpret, synthesise and map out the topology of a course, not the lecture notes. In the study by Flowers *et al.* (1999), similar efforts to change the perception of students on the role of lecturers and lecture notes under a traditional approach of teaching and learning were reportedly conducted after discovering the over reliance of students on course notes.

The next most suggested measure to improve the usefulness of the VC application is to improve the computer facilities specifically at the FEM. Although difficulty in getting access to computers was not cited as a major problem in using the VC application in Table 9, improvement in the facilities at the FEM in particular, can enhance the VC usefulness.

Although many other suggestions to improve the usefulness of the VC application were provided by respondents as shown in Table 14A, these suggestions appear not to represent the views of the majority. Two students suggested the inclusion of model questions and answers. If the usage of a particular module of the VC application is an indication of the usefulness of that module, based on the study by Flowers *et al.* (1999), then model questions and answers should indeed be included since the module was found to be heavily used. On the contrary though, Collett *et al.* (1999) reported that in their study, the module on past questions was hardly accessed by students.

One student suggested that in order for the VC to be viewed as more useful, students should be provided with free access to the application. This is in fact already the case if students are to access the VC application through the Intranet Lotus Notes system at the FEM. In relation to the second most popular suggestion where students suggested that more facilities should be provided at the FEM, perhaps the reason for suggesting so was cost-related. But, given that students did not provide reasons for suggesting so, such a suggestion remains a speculation.

Suggestions by the two students who did not use the VC application as shown in Table 14B were also related to computer facilities and cost. The suggestions, however, do not appear specific to the VC application only. Both suggestions naturally lead to better access to computers, which means that general usage of computers and its implication can be enhanced.

SUMMARY AND CONCLUSION

This study examines issues on the use of the VC application by students at the FEM. Four areas looked into are the pattern of usage of computers in general, including source of computer access; usage of the VC application; problems and benefits in using the VC application; and students' suggestions on ways to improve the usefulness of the application.

In terms of the facilities used by students, findings in this study show that only slightly

more than a quarter of the total respondents used on-campus computer facilities. Among those who used on-campus facilities, more appeared to use the facilities provided at cyber cafes. Such a pattern of usage could be a result of many reasons. For instance, because students realised that the facilities available on campus were insufficient, they resorted to using other facilities such as borrowing other people's computers outside or using facilities at cyber cafes rather than trying to access facilities at the faculties' laboratory, the university's computer centre, the halls of residence or the library. Or, it could be that students prefer not to use on-campus university facilities because they already own personal computers or have access to other sources.

Judging from further students' responses, although students did not unanimously perceive that non-access to on-campus university facilities was a hindrance to their ability to use the VC application, they believed that one way to improve the usefulness of the VC application was to increase the on-campus university facilities. Students also indicated that computers were mostly used for purposes of word processing and accessing the Internet and e-mail. Whenever they faced problems with computers, students were found to refer mostly to their peers or staff at cyber cafes rather than lecturers. Additionally, prior to being exposed to the VC application during the semester preceding the May 1999/ 2000 semester, most of the respondents used computers about once a week.

Feedback from respondents showed that only about 2% of them did not know how to use the VC application, hence, did not use it at all. The majority of those who indicated that they knew how to use the VC application and indeed did use the application, obtained the knowledge from the lecturer during the hands-on sessions. There were some who learned from their peers. Among the modules in the VC application at the FEM, the "Assignment and quizzes" module was most popular and most regularly used. The "Students register" and "Discussion" modules were the least popular.

The main problem that students faced while using the VC application was the length of time spent to get access to the VC application. Difficulty in getting help when faced with problems was another problem cited by students. The benefits that students believed they had experienced in using the VC application were in relation to information on the course. Through using the VC application, students perceived that their knowledge of a particular course was enhanced. However, on aggregate, it seemed that the main benefit of the VC application was perceived to be the role it played in the communication process between students and lecturers.

When asked whether the use of the VC application should be extended to all lecturers in the university, more than 80% of the respondents would like this to happen, including the two students who had never used the VC application. Their main reason was because most of them believed that the VC application could help their communication with lecturers. Such a perception was also held by the two students who did not use the application. Those students who did not want to see the usage extended to all lecturers at the university cited inadequacy of computer facilities as the main reason.

In order to enhance the usefulness of the VC application, students suggested that lecturers provide more complete sets of notes than currently available. Some others believed that the on-campus university facilities, especially at the FEM premise, should be improved.

The findings in this study as highlighted above have implications on the future approach of education in general and at the FEM in particular. The VC application can be a useful approach to learning if used appropriately. Students' responses show that generally, the use of the VC application at FEM can still be considered low with the average usage of about less than once a fortnight. The use of the "Discussion" module, for instance, which educators believe can be a useful platform to enhance learning, was found to be rare. Given the availability of vast room for improvement, measures have to be taken to encourage further usage. Of equal importance is to emphasise the overall role of the VC application in relation to students' learning process. It has to be stressed that the VC application is never intended to supplant traditional lectures so that students should never view usage of the VC application as an opportunity to be absent from lectures. It is indeed unfortunate that the majority of the students perceived that among ways to enhance the VC application usefulness, lecturers should provide more complete sets of notes. Problems

highlighted by students on usage of the VC application that they faced should not be dismissed without further consideration. Likewise some of the suggestions made by students should be deliberated upon. It should always be remembered that if the VC application is not perceived as useful to them, students may be reluctant to use it. With the investment cost involved in providing the VC application facilities, it would indeed be wasteful if these facilities were not utilised.

In terms of its contribution to the literature, it is also hoped that this study will provide the impetus for future research in the area. Given that it is only exploratory, further work involving a larger sample size and students from other disciplines and examining other issues on the usage of the VC application is needed to obtain a more comprehensive picture of the VC learning environment. Nevertheless, as it is, this study does meet its particular objectives.

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