TEACHING QUANTITATIVE COURSES TO DISTANCE LEARNERS

22nd June 1996

by

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WORLD CONFERENCE ON EDUCATIONAL TELECOMMUNICATIONS

BOSTON, MASS., USA

June 17-22, 1996

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Abstract

This paper describes how quantitative courses such as mathematics and statistic are taught at the Center for Distance Education, University Sains Malaysia (USM) in Malaysia. A combination of self-instructional printed materials and audio-conferencing are used to deliver study materials to students. Both delivery methods are known for their effectiveness and cheap to operate. Problems associated with these delivery methods are also highlighted. A brief descriptions about the first year distance learners who participated in these courses based on a recent survey are presented. Finally, several suggestions on how distance educators can help distance learners to study quantitative courses are provided.

Background

As Malaysia is moving rapidly towards becoming an industrialized country by the year 2020, the demand to produce a large number of quality graduates and skilled workers has increased. According to the Ministry of Education, there were about 50,600 Malaysians have studied in various higher institutions overseas which formed 20 per cent of students in tertiary education in 1995. The enrollment in the local higher institutions has also increased significantly. Enrollment in degree, diploma and certificate levels increased from 100,590 in 1990 to 152,410 in 1995, or a 52 per cent increased (New Strait Times, 1996).

Setting up more new universities is not a practical solution as this would take time and the cost is indeed very high. Further constraint limiting increased student enrollment in Malaysian universities is the shortage of qualified academic staff. In view of the rise in demand for higher education especially from the working adults who seek better qualifications and skills, distance education can be considered as a viable alternative to meet the Malaysians' educational needs. Distance Education has been in the center stage of education especially in the last two decades and it has been implemented successfully in various forms in many countries.

In Malaysia, the public distance education at higher education level was pioneered by the Universiti Sains Malaysia (USM). USM has been entrusted by the Malaysian government to offer distance education programs which was known earlier as the Off-Campus Academic Programs. The program has undergone many changes since its establishment in 1971 including the name of its organization which has been changed recently (1995) to the Center for Distance Education (hereafter CDE). However the objectives of the program remain the same and among them are:

(i) to help adults who had earlier missed the opportunity for obtaining a higher education and thus prepare themselves for a degree qualification,

(ii) to narrow the gap of educational opportunities among various ethnic groups in the country ,

(iii) to take education to the economically deprived and geographically isolated areas,

(iv) to increase the availability of skilled workforce,

(v) to improve the performance of those already in employment by updating their knowledge and skills.

For the first two years, only Social Science and Humanities courses were offered and later in 1973/74 the University began offering Science and mathematics courses through distance learning mode. Following its academic success and demand in distance learning the University through its Center for Distance Education (CDE) started new programs. Table 1 shows the types of program currently being offered and the number of students enrollment for the coming 1996/97 academic year.

Table 1. Programs and new enrollment in 1996/97

Programs	Number of new students enrollment 1996/97
Remedial Science	236
Science	82
Humanities	153
Social Science	282
Education (Science)	117
Education (Arts)	222
Engineering	140

Source:PELAPOR May 1996

Since its establishment twenty-five years ago, the distance education program has produced 3875 graduates of which 1380 were in Social science, 1776 in Humanities and 719 in the Science programs (CDE Handbook, 1996/7). Being a conventional university, USM has similar academic entry qualification to students who want to study either by distance mode

or face to face instruction held on campus. The additional requirement to enroll in the distance education program is the applicants must be at least 21 years old. The minimum duration to complete a degree program is 5 years and beginning the academic session of 1996/97 students may complete the degree within 4 years.

Teaching Quantitative Courses to Distance Learners

There are more than 350 courses offered by the CDE. The discussion in this paper concerned only with the two quantitative courses offered at the CDE in the academic session of 1995/96. The courses are JKJ 101: Quantitative Method and JIM 101: Calculus which represent the statistic and mathematics courses respectively. For the purpose of discussion both courses will be referred to as Quantitative courses. These courses are classified as introductory course, hence the majority of the students are first-year students who are new to distance learning mode.

The courses officially began in June 1995 and ended in April 1996. A schematic outline of the course structure for the JIM 101 is given in the appendix A. Four hundred and sixty three students enrolled in JKJ 401 and about 140 students in JIM 101. Printed materials and teleconferencing are the two major modes used in the instructional process of both courses.

Printed Materials

Quantitative courses such as mathematics and statistic courses offered at the CDE, USM are delivered in the form of printed materials called modules. As distance learners are expected to become self-directing in their learning, a module is specially designed to be an interactive text for the students to work on independently. The course content is presented in a carefully structured manner which should include guidance, motivation and encouragement. The writing of distance learning units is not just a matter of converting ordinary lectures into print. The mathematical/statistical concepts must be fully explained in simple writing and direct. In fact all written materials need to be well structured an self-explanatory. Certain pedagogical elements must be included, like objectives, self-assessment questions with answers (practice exercise).

The module has the following features:

- Conversational style of language

  The language used in the module is of conversational type as if the instructor is talking to students directly. For instance, words like 'you', 'I' and 'we' are used regularly to bring students closer to instructors when addressing a particular topic in the course.

- Active language and short sentence

  Active language and short sentence will make reading module more interesting and easy to comprehend.

- Structured

  Contents are organized and structured so that distance learners can follow the course easily. For example, the easier materials are introduced at the beginning of the module and then students are slowly walked to a more complex materials.

- Activities Packed

  A lot of activities are provided in the module. Activities are varied and spaced according to the needs of a particular topic. Common activities ranged from asking students to read a section in a suggested book to solving a problem. Many examples and solutions to the problems are given. Students are encouraged to solve all problems given in the exercises and answers are available at the back of the module.

A typical lesson in a mathematics modules may include the following:

--lesson objectives(in behavioral terms)

--brief introduction to the lesson content

--main content (activities, examples, self-assessment questions (SAQ))

--summary

--exercise

--brief solutions to SAQ's

Modules are distributed during the compulsory annual orientation programs for the new students. Modules have several advantages over other media, chief among them are:

* Low cost

  Compare to other media like video, printed material is cheaper to produce especially when the number of copies are large.

* Handy and Easy to access

  Students can bring and read module anywhere and at anytime they like without any need to have additional accessories like cable or batteries to access the material.

Many academic staff started their teaching career at the CDE with no proper training in module writing. In order to assist them in preparing the module, from time to time CDE runs a number of in-house sessions or workshops to train instructors to be a module writers.

Teleconferencing

Teleconferencing is becoming an important component in delivering distance education courses because it brings distance education students "together" and giving them a sense of being part of a class. Teleconference permits interactive group communication through an electronic medium that carries audio, video or text signals. Basically, we can identify three main types of teleconferencing: audio teleconferencing, video-teleconferencing and computer teleconferencing.

The development of a teleconference system at CDE, USM started in 1988 when the center introduced its first audio-teleconference. Later in 1991 audio-graphics teleconference was installed which further enhanced the two-way communication between students and instructors. This is particularly true in delivering quantitative courses such as mathematics and statistic. Before audio-graphics was introduced it was pretty awkward and clumsy discussing mathematical and statistical problems using audio only. Difficult concepts are much easier to explain and demonstrate to the students with the graphic components along with the audio.

The teleconferencing system at the CDE, USM uses the telephone lines leased by the telecom company to link the students in various regional center with the instructor at CDE in Penang. The system consists of a bridge (a multi-line interconnection device), microphone, speaker and electronic writing board. There are support staff such as technicians at the center who manage the system and help students and instructor should there be any technical problems which could disrupt the teleconferencing session.

Students will go to their respective regional centers during the weekends (according to schedule) to attend the teletutorial session conducted by the instructor. Due to the different weekends in some of the states in Malaysia, the regional centers are divided into two zones. Zone A consists of regional centers having Thursday and Friday as their weekends while zone B having their weekends on Saturday and Sunday. See appendix B. Thus each teletutorial session has to be conducted twice for the two different zones. Each meeting lasts for an hour. Since there are many courses offered by CDE, only 5 slots of an hour-session teletutorial were allocated to JKJ 101 and 6 slots to JIM 101. Obviously the number of meetings are small but at CDE, audio-graphic conferencing serves to complement the teaching-learning process. The allocation of a time slot for the teletutorial is included in the academic planning book and distributed to all the students before the start of a course. Teletutorials required a lot more planing than the conventional tutorial. In the case of JIM 101 and JKJ 101 the agendas for the discussions and other printed material were sent to the students well in advance. We found the printed agendas helped the students to be more prepared and make the teletutorial more structured. All teletutorial sessions were being audio-taped and a copy was being sent to all the centers for the benefit of students who missed the session. The solutions to the mathematical problems discussed were also posted to the students in East Malaysia. At present there is no teleconferencing facility in East Malaysia.

Instructors can conduct sessions from any regional centers (except in East Malaysia) should they have to be away from the CDE in Penang. The flexibility and the reasonable

cost to operate make audio-conferencing a useful 'partner' to the CDE. Furthermore, audio-conferencing is very reliable. More often than not, audio-conference worked well. Table 2 shows some problems related to audio-conference that have been reported throughout 1995.

Table 2: Problems While Conducting Audio-Conferencing and Number of Cases Occur in 1995

Problems related to:	Number of cases reported
audio	8
graphic	28
audio and graphic	5
equipment (AEC-400)	4
line disconnected	4
lines not functioning	5
electricity supply	8
noise	1
thunderstorm	1

Source: CDE Technician Report, 1995

Some of the problems were temporary failure that had been corrected within a short time but there was also case like when line or equipment broke down and it took days to fix. Normally not all centers were affected by the same problem at the same time, for instance one center would experienced graphic problem but the other centers did not. In 1995, problems related to graphic were higher than audio or 3.5 times more than audio. These caused some difficulties to instructors and students affected but as long as the audio was functioning the session could still be conducted. Audio was the main strength of audio-conference, without it the discussion and exchange of information would be very difficult. Only 8 cases were reported about problems related to audio (some temporary failures) in 1995 by certain regional centers and this showed that audio-conference was dependable. In the month of January and November, 1995 no problems were noted by the technician at the CDE.

Annual Intensive Course

In order to increase communication and interaction between the distance learners and the lecturers, and between the student themselves, the students are required to attend three weeks annual residential intensive study programs at the main campus. The activities

organized during the intensive course include attending face to face tutorial, laboratory works, counseling, others social activities.

Evaluation

Evaluation was based on assignments, two continuos assessment tests and the final examination. For JKJ 101, assignments and assessment tests contribute 40% of the total marks while the final examination carries 60% of the marks whilst for JIM 101 the contribution are 30% and 70% respectively. Three graded assignments were given for the JIM 101 and JKJ 101's students. Students have to mail the completed assignment and must reach the CDE before the due date stated on each assignment. Each assignment was graded and appropriate comments were given. Comments constitute and important feedback as the students need to know their weaknesses and how they can improve in their subsequent works.

Support Systems

Any successful distance education systems need a solid and effective support systems to ensure success for their students. The support services in distance education should be of a varied nature to provide the best learning environment for the individualized style of learning. Among the support services available at the CDE are :

Regional Center. USM established a network of regional center as one form of support service for its distance education program. They are located in the capital cities of the states and managed by a resident tutor. There are now 11 regional centers set up for the Science, Arts and Remedial Science and 5 more centers for the engineering programs. Appendix B shows the distribution of the regional centers according to zones. Generally the students use regional center to attend the weekend teletutorial sessions and taking their tests/examinations. The small library in each regional center contains a relatively restricted number of reference books. However books may be borrowed from the USM main library in Penang through mail for students living in remote areas. From the interviewed with some students, little use is made of audio visual equipment while some students use the center as their venue for group discussions.

Counseling. Studying at a distance can be both a very challenging and demanding experience for an adults students having other commitment in life. Under the CDE counseling system, the instructors are appointed to be an advisor for a particular regional center. The advisor provides general educational advice and support irrespective of whatever courses the student is taking. There is an answering machine taking student's call after the office hours. The counselor coordinator will then direct the problems or any queries to the advisors concerned.

Students Characteristics

Characteristics of students who took these courses were collected through a survey done during the annual intensive program in November, 1995. Questionnaires were given to students in both courses and 396 out of 603 questionnaires were usable, a return rate of 66%.

Demographic Profile

Males made up 57% of the respondents, female 43%. At the CDE, male students were always the majority group. Of the respondents, 42% were in the age of 25-29 years and 38% were between 30-34 years old. So about 80% of the total sample were in the age of 25 to 34 years old. About 56.3% were married, 42.7% single and 1% single parent.

Reasons for Pursuing University Education

Table 3 illustrates the reasons why respondents chose to pursue university education. Most common reasons were to get a degree and career advancement which accounted 36% and 32% respectively. About 12.4% of the respondents cited seeking knowledge as the reason and 10.4% said they need university education to gain higher social status. Only 5.8% said they need university education for career change.

Table 3: Reasons for Pursuing University Education (Only one response required)

Reasons	frequencies	Percentage of responses
To get degree	143	36.1%
Career advancement	127	32.1%
To seek knowledge	49	12.4%
Higher social status	41	10.4%
Change career	23	5.8%
Interested in the major applied	12	3.0%
To fill the free time	1	0.25%

In this survey 69.4% of the respondents were government's school teachers and the rest were mostly from the administrative and uniform group. At present, having a degree is required for one to be considered to a higher position or salary scheme in the government service. As such to get a degree can be a compelling reason to pursue one's education in Malaysia.

Reasons for Choosing Distance Learning to Earn a Degree

Respondents were asked to give three reasons why they chose to study at a distance to earn a degree. Table 4 shows the reasons students gave for choosing distance learning. The three top reasons for choosing distance learning were present career would not be affected (79.04%), flexible in time (46.2%) and not separated from family (38.13%). For these adult students their concerns were revolved around career, time and family. Hence, distance learning is a practical solution for them. Low tuition fee was not in the top three reasons for participating in distance learning. This can be attributed to some extent to

higher income level enjoyed by many Malaysians today who are more able to pay higher tuition fee.

Table 4: Reasons for Choosing Distance Learning (Three responses were required)

Reasons	frequencies	percentage of responses
Present career would not be affected	313	79.0%
Flexible in time	183	46.2%
Not separated from family	151	38.0%
No other choice	129	32.6%
Not required to attend university fully	116	29.3%
Low tuition fee	89	22.5%
To try a 'new' way of learning	43	10.9%

Source of Encouragement to Study at a Distance

Respondents were asked to indicate who encouraged them to study at a distance. Only one response was required. Table 5 shows the results of the response.

Table 5: Source of Encouragement (Only one response required)

Source of encouragement	frequencies	percentage of responses
Self	281	71.0%
Spouse	58	14.7%
Friends	29	7.3%
Family members (other than parents)	18	4.5%
Parents	9	2.3%
Department head	1	0.25%

Majority of the students (71.0%) indicated that the decision to enroll in the distance learning program was made by themselves. They were the ones who encouraged or initiated the moved to be in the program voluntarily. This is a typical characteristic of adult learners. Adults voluntarily participate in learning activities and according to Even (1987, p.22), "Adult learning is voluntary in all its dimension - participation, acquisition, and

outcome." As a self-initiator, a student's chance to succeed in the program is greater compare to the one who is otherwise.

Concerns of Distance Learners

Respondents were also asked to indicate the top five items that concern or worry them most as they became distance learners. Table 6 shows the concerns and the responses.

Table 6: Concerns of Distance Learners (Five responses were required)

Concerns	frequencies	percentage of responses
No systematic study technique	291	73.5%
Fail in the exam	288	72.8%
Do not know to manage time	247	62.4%
Lack of motivation	178	45.0%
Family problems may arise	152	38.4%
Loneliness	139	35.0%
Financial problem	132	33.3%
Lack of reading skill	111	28.0%
Instructors do not understand adult learner's situation	111	28.0%
Lack of writing skill	90	22.7%
Health problem	74	18.7%
Quality of the degree is lower than the full-time program	55	13.9%

'No systematic study' was the top-most concern among students (73.5%), followed by the 'fear of failing in the exam'(72.8%), 'do not know how to manage time' was the third concern (62.4%), the fourth was 'lack of motivation' (45.0%), and the fifth 'family problem may arise' (38.4%). Knowing how to study systematically is crucial to adults and many of them knew that they need to learn how to study especially when studying at a distance. Many had been away from formal education for a number of years and had forgotten some of the learning skills. Thus the students were approaching the quantitative courses with certain level of anxiety and lack of confidence.

The adults students were equally worry they would fail in their quantitative exams which accounted for 72.7% of the respondent. Quantitative courses such as JKJ 101 and JIM 101 are a compulsory course and they must pass to proceed to a higher level. When a student fails in a course he/she is required to repeat it which can cause some delay in completing the program, a situation that no one wishes to be. These feelings are intimately connected with fears of losing face and self-esteem. After some years leaving formal study, 73.5% students apparently felt they need to acquire new study skills.

It is interesting to note that majority of respondents did not cite the quality of the degree through distance is of a lower quality than the full time program as their main concern. This indicates that students have trust in the USM's quality of distance education programs. After all, USM through the CDE has been in this business for 25 years and the accumulated experiences gathered have helped the CDE to provide quality programs to Malaysians.

Items Owned by Distance Learners

Table 7 shows the responses pertaining to the items respondents owned. The item that most students owned is the radio with 98.2 percent responses followed by the television set with 96.2 percent responses. The next item is the cassette player 92.7 percent and followed by telephone 82.6 percent. About 24 percent of the respondents have computer at home.

Table 7: Items Owned by Distance Learners (More than one choice acceptable)

Items owned	frequencies	percentage of responses
Radio	389	98.2%
Television	381	96.2%
Cassette	367	92.7%
Telephone	327	82.6%
Video player	230	58.1%
Computer	95	24.0%
Facsimile	10	2.5%
None of the above	0	0%

More than 90 percent of the respondents owned radio, television and cassette at home. Alsagoff's study (1985) showed that only 45.5 percent of the students at the CDE had a telephone but now 82.6 percent. Items like telephone, cassette and radio are essential to distance learners at the CDE. They can overcome the feeling of loneliness by

contacting their coursemates or instructors using the telephone. They can listen to teletutorial discussion

through tapes if they missed the session or just want to review the discussion. Students also are encouraged to listen to the radio as the CDE has been allocated a slot every week by the public national radio.

Problems Encountered in Teaching Distance Learners

The failure rates among the distance students taking quantitative courses like JIM 101 was relatively high. Lack of practice was normally quoted as the main reason. Practice alone would not be sufficient unless it is coupled with informative feedback from the instructor. Informative feedback is a kind of feedback which not only tells the learners why their working is incorrect but also explains with appropriate examples or by referring back to theorem or definition in the modules. Speedy helpful feedback to students on their assignment is vital to the teaching-learning process. In particular, late (or non at all) feedback from the instructor on students' assignment was apparently disrupting and many commented on this in the questionnaires. Another problem was the large number of students who enrolled in these courses that made interaction between students and instructors less effective. Further more instructor could not provide speedy feedback on students' assignment.

Due to the long break from formal education, many students lack the necessary mathematics study skills. Their learning style may be quite unsuited to learning mathematics. For example, some students would search their modules for similar examples or techniques, while others would try to identify relevant principles as a basis for solving the problems given in the assignments. Mathematics study skills programs designed specifically for new distance learners do not yet seem to exist.

It was apparent that the allocation of more teletutorial slots for low level qualitative courses is desirable. Having more teleconferencing session would help new distance learners to sustain motivation, pacing and provide instant feedback to get them going.

Some adult learners find quantitative courses especially JIM 101 a "dull and dry" subject and this has some impact in their final grades. Students also commented that lack of time and commitment towards family and career had caused them to put less time to study. Most weak adult students also seemed reluctant to contact their instructor/advisor when they faced difficulty with the course.

Discussion and Recommendations

Teaching quantitative courses at a distance is a very challenging task due to physical separation between instructors and students, adult learners whom study is not their main responsibility and the large number of students that instructors have to teach. The printed materials or modules are the main medium of delivery and expected to stay at the CDE for many more years as modules are not too costly compared to other electronic or newer

technologies. The convenient feature is another positive aspect of the module that make it easy for students to study when and where ever they like.

Interaction between students and instructors are critical to the learning process. Two-way communication between distance learners and an instructor, counselor or mentor should be as regular as possible to minimize ambiguities, misconceptions and frustration (Smith, 1979). In teaching quantitative courses, the interaction and two-way communication were enhanced by using the audio-graphic conferencing, three-weeks intensive program and communication done through telephone or mail. Interaction between students and students, and students and instructor were high during the intensive program. Most students favor intensive course as they could concentrate better, discuss with friends and instructor (Lourdusamy, et al, 1989).To facilitate personalized audio-video communication and to enable students to interact with instructors at the main campus, CDE, USM has recently set up a comprehensive video conference system at all its 15 centers in Peninsular Malaysia. With the VTEL video-conferencing systems, instructors can give lectures as well as send multimedia presentations to students in remote sites. Fully-interactive course material can be developed to foster the highest acceptance and enthusiasm among the students.

Quality study materials and communication between instructor and students will be two major issues that need to be reviewed continuously by distance educators. Study materials or modules have to be up-dated at regular interval to accommodate the new knowledge and information. At present, up-dating modules and producing them with the current system of production are quite time consuming. The time lag between the production process(including the writing part which normally takes the longest time) and the learners is going to decline precipitously , with the use of computer. The same is true to the communication between students and instructors which can be further improved by

One way of establishing an effective communication is to use a combination of e-mail and Scientific WorkPlace (Lewin , 1990). USM has recently set up campus-wide network called USMNET to facilitate full inter- and intra-departmental(as well as branch campuses) communications. By networking all the regional centers and allowing the distance learners to have access the email and WWW, adequate line of communication between students and instructor can be established for interactive learning.

Understanding the characteristics of adults distance learners can help instructors to meet their educational needs better. Instructors may reconsider the appropriateness of the course contents, the way they communicate with students and the delivery methods. For example, the results of the survey indicate that there are about 24% of the students have personal computer at home. This information is useful for quantitative courses' instructors or other distance educators to seriously start thinking how to deliver study materials and conducting teaching-learning activities through computer. Even though the number is still small but the use of computer is increasing in Malaysia. According to the Star (1996), the growth rate of Malaysians who subscribe to Jaring which is the local gateway to internet is about 22 percent per month. As Malaysia's economy is booming and more people can afford to have a PC at home, it is expected very soon that teaching and learning via computer will be the order of the day at near future.

Another encouraging development is the launching of the first Malaysia East Asia satellite (Measat) in January 1996. On board Measat is a transponder which is a transmitter that allows for voice, data and video transmission which is suitable for interactive distance learning. With this development, it is visioned that the local university will be able to make use of satellite-based facilities to enhance the distance learning programs in future.

The following suggestions are offered in the hope that teaching at a distance can be varied and improved:

1. The use of other media such as video and computer can be increased as more students are expected to have or easy access to them. Students are known to have varied learning styles, so in this way students who are more inclined towards these media will gain some benefits or improve in their study.
2. Students should be exposed to techniques of studying at a distance. Even though, there is no such thing as one effective study technique but some pointers or guides on how to study at a distance may probably help students to study smarter and better.
3. Motivation seminars or courses should be done at strategic times to check the decline of motivation among students. Quantitative students or those who take mathematics may lose motivation or get discourage when they are not able for example to solve complex problems. The ability to stay 'cool' and have positive attitude in studying are critical to students' success.

Acknowledgement

The authors wish to thank the Universiti Sains Malaysia for the provision of funds to attend the conference.

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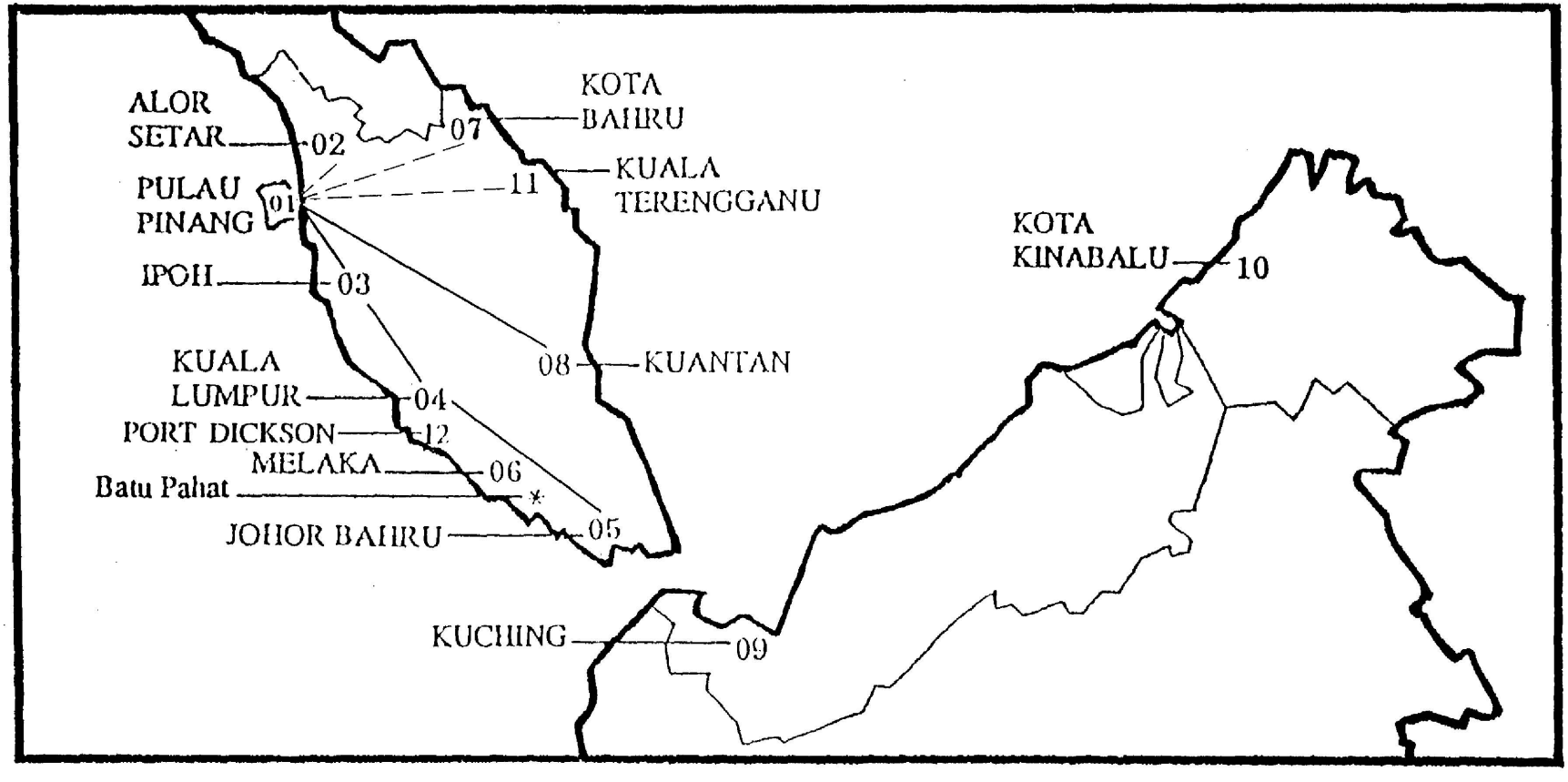
APPENDIX A

Table 8: JIM 101- Calculus course schedule 1995/6

Week Number	Beginning Monday	Topics		Important Dates
1	29th May '95	MODULE 1	Pre-Calculus: • Set • Number System (including complex numbers) • Functions	Orientation New Students : End May Teletutorial 1: 16/18th June '95 Teletutorial 2: 7/9th July '95
9	24th July '95			Assignment 1: 5th Aug. '95
10	31st July '95	MODULE 2	• Limits • Continuity • Derivative • Applications of Derivative (Module 3: Integration)	Teletutorial 3: 5/7th Oct. '95 Continuous Assessment Test 1: End October '95
23	30th Oct. '95			Assignment 2: 4th Nov. '95
24 - 26		INTENSIVE COURSE		6th - 26th November 1995
27	27th Nov. '95	MODULE 3	• Integration (cont.) • Area under the curve • Exponential, Logarithmic, Inverse of Trigonometric and hyperbolic functions	Teletutorial 4: 21/23rd Dec. '95 Teletutorial 5: 18/20th Jan. '96 Assignment 3: 6th Jan. '96
34	15th Jan. '96			
35	22nd Jan. '96	MODULE 4	• Conic Sections; parabolic, ellipse, hyperbolic • Polar coordinates • Applications of the integral; arc length, surface area, center of mass, moment of inertia,	Continuos Assessment Test 2 : Feb. '96 Assignment 4: 2nd March '96 Teletutorial 4: 21/23rd March '96 Final Examination: Early April 96
43	18th March '96			

REGIONAL STUDY CENTRES and STUDY CENTRE RECEIVING VIDEO CONFERENCING



REFERENCE

ZONE A
- 01 - Pulau Pinang
- 03 - Ipoh
- 04 - Kuala Lumpur
- 05 - Johor Bahru
- 06 - Melaka
- 08 - Kuantan
- 12 - Port Dickson

ZONE B
- 02 - Alor Setar
- 07 - Kota Bharu
- 11 - Kuala Terengganu

* - Sub-Centre

- 09 - Kuching
- 10 - Kota Kinabalu