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## Research Note

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### Evaluation of a Course in Zoology: Student Responses

B. GAYATHRI JAYATILLEKE

*This paper reports an evaluation of the course on Animal Diversity offered for the Bachelor of Science Degree Programme (B.Sc). The majority of students had found the course 'difficult'. Student performances supported this view with a pass rate of approximately 35%. The difficulties encountered by the students were related to different aspects of the course such as workload, inadequate day school support, insufficient time allocation for laboratory work, and inadequate facilities at the 'mini museum' of zoological species. Students also stated that conventional lectures were more desirable indicating a difficulty in understanding the course material, thus raising doubts about the presentation of course material in the distance format.*

### INTRODUCTION

In an institution of learning the formal evaluation of programmes is considered vital. It helps to detect the weaknesses of the teaching programme in order to improve the overall efficiency and effectiveness of the institution. Course evaluation is a part of programme evaluation and it could be carried out at any stage at the design stage, development stage or at the presentation stage.

It is necessary to modify the course material to suit the changing characteristics of students and update academic content. This helps to assess the 'fitness for purpose' of any course. In the Open University of the United Kingdom (OUUK) all new courses are monitored at the end of their first presentation (Calder; 1994).

This paper reveals the outcomes of a pioneering effort to evaluate the course - Animal Diversity (PSU 1101 later replaced by PSU 1218) at the Open University of Sri Lanka (OUSL). It is one of several courses that make up the B.Sc Degree Programme of the OUSL. It was first presented in 1983 as a one-sixth credit course and transformed into a one-third credit course in the academic year 1993, by including the Zoology practical course (PSU 1104). "Credit rating" of a course here refers to the estimated number of hours necessary for study.

The course is divided into two 'blocks' of materials, (block I-188 pages and block II-263 pages). For PSU 1218, students are provided with a laboratory manual (39 pages) and workbooks (block I - 37 pages and block II- 35 pages). These workbooks are to be completed by the students during practical sessions at the 'mini museum'.

The teaching strategies includes day schools (3 days), laboratory classes (2 days), and assignment tests (2 open book tests). In addition, students are allowed to use the 'mini museum' which is a collection of specimens, slides and charts and are expected to complete their workbooks. Further, students are requested to visit the Zoological Gardens at Dehiwela and observe animals on their own.

This evaluation was carried out after the presentation of the course (summative evaluation) for nine cycles with the hope that the findings would help the restructuring of the course that was then pending.

The main objectives of the survey were to find out students' perceptions of

- the different components of the Animal Diversity course, and
- the suitability of the course material as a self-instructional text.

Holmberg (1983) stresses the importance of having a 'guided didactic conversation' or two way communication, on one hand with the distance learner and on the other hand with the institution, to mitigate the isolation of the distance learner. One way of achieving this target is to design self-instructional texts in such a way to enable the learners to have an 'internal didactic conversation' i.e. to 'talk to themselves' about the subject matter and ideas they encounter in a text. Certain key instructional devices to be incorporated in the text as aids are suggested to facilitate students' use of the text.

According to Marland and Store (1993), key instructional devices such as those listed below help the learner. These include

- devices which orient the learner and introduce the textual material (advance organisers, overviews, pretests, and objectives)
- appropriate questions to assist learners (self assessment questions, in-text questions and exercises)
- presentation techniques which have instructional consequences (graphics, typographical cues).

Research findings also reiterate the idea of having appropriate questions in the text, to help the learner to participate actively in the learning process.

*Students value in-text questions as useful study aids ... 60% of the students believed that the absence of questions had hindered their study of the unit, and none claimed that the absence had helped them*

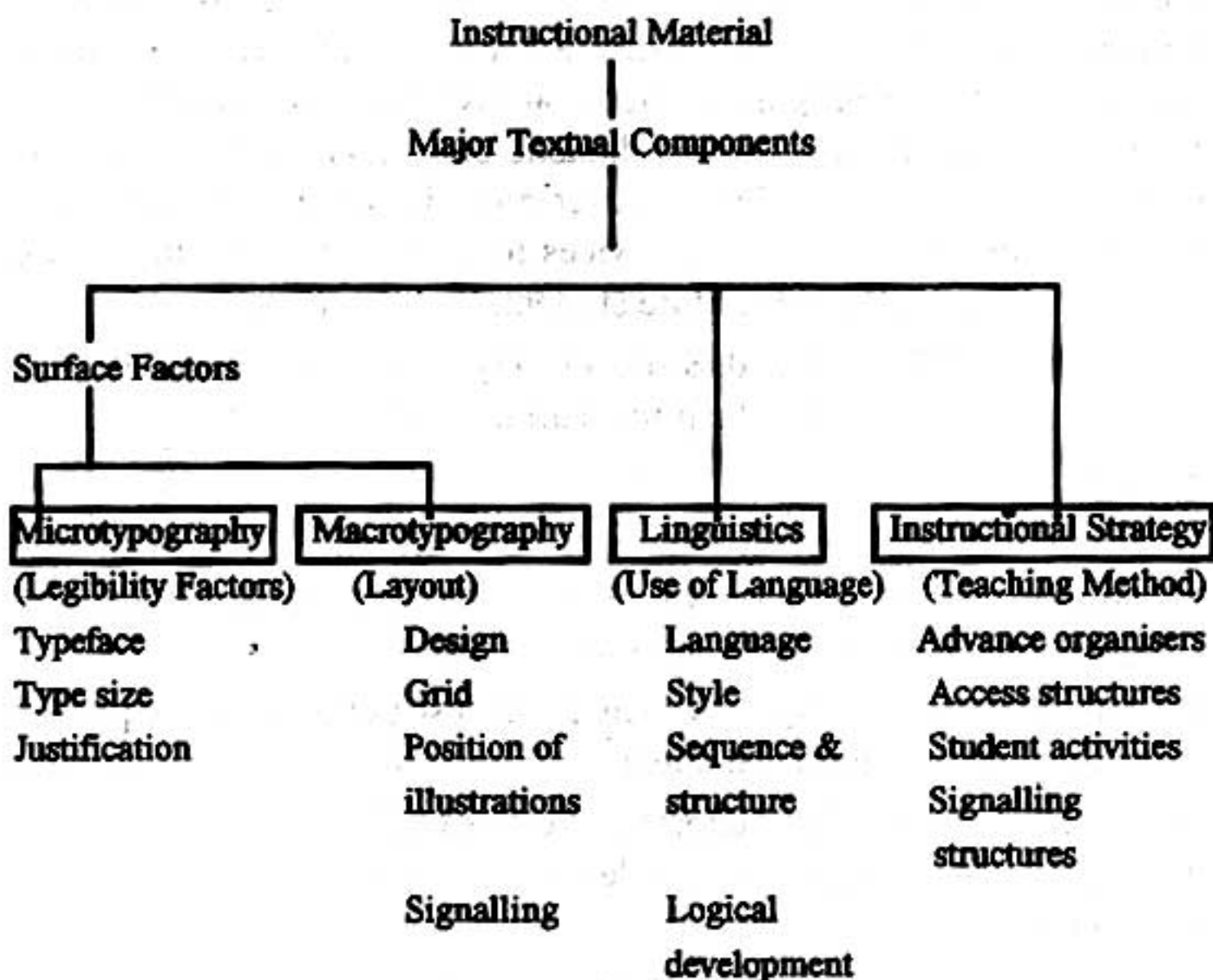
(Duchastel and Whitehead; 1980, pp. 46).

In addition, language style is recognised to be important. Rowntree (1994) suggested the use of user-friendly and conversational language as if the tutor were addressing the student in a classroom.

His concept known as tutorial-in-print is widely used in open and distance learning institutions.

The recommended theoretical framework for instructional material is shown in Figure 1.

**Figure 1 - The Theoretical Framework for Instructional Material**



*(Source: Parer, M S. (1988) - Textual design and Student Learning)*

This study attempted to discover to what extent such guidelines had been followed in the course on Animal Diversity.

## METHODOLOGY

The survey was conducted using questionnaires. The instrument consisted of three parts and included a mixture of pre-coded questions and open ended questions. Part 1 related to general information regarding the course. Part 2 and Part 3 dealt with the 'instructional design' aspect of the course material (information related to block I and block II respectively). The questionnaires were administered in Sinhala and English.

The survey was carried out at the end of the course. Questionnaires were distributed and collected at a face to face session.

### Response rate

The response rate is presented in Table 1.

*Table 1 - Response rate for the course on Animal Diversity*

PSU 1101*	PSU 1218	Total No. Sat for the final examination	Responded	%
137	296	433	280	65

\*PSU 1101 - resit/repeat students

*Source: Survey Data*

## FINDINGS

### Pass rate

Table 2 presents the student performances in Zoology courses at level 3. Level three at OUSL corresponds to the first year in a conventional university. The data revealed that the lowest pass rate was in the Animal Diversity course.

*Table 2 - Pass rate - All Zoology Courses at level 3*

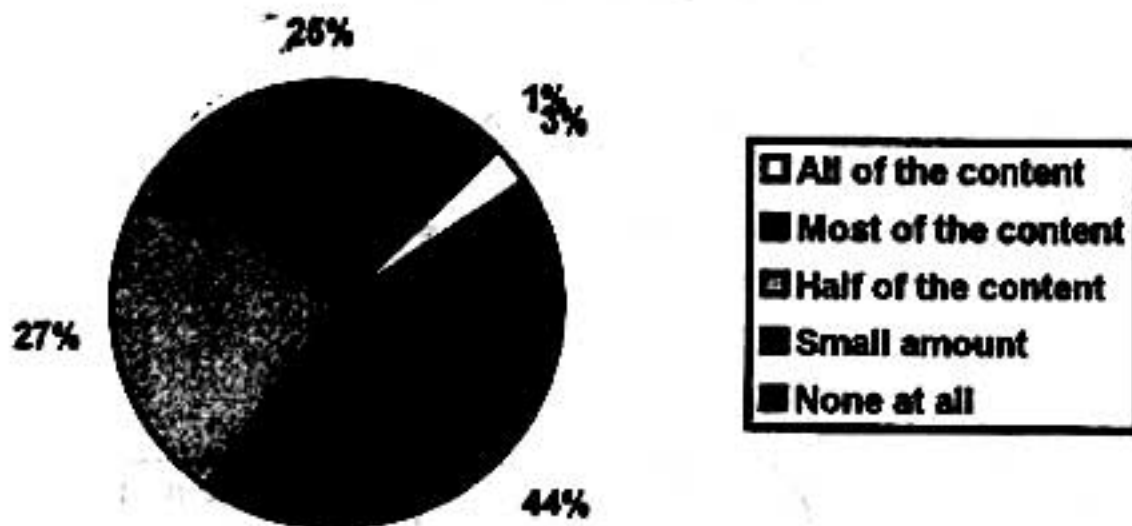
<b>Year</b>	<b>PSU 1101 Animal Diversity</b>	<b>PSU 1102 Animal Physiology</b>	<b>PSU 1103 Animal Ecology</b>	<b>PSU 1104 Zoology Practical Course</b>
1990	33%	44%	43%	42%
1991	33%	40%	43%	73%
1992	25%	88%	81%	62%
1993	66%	92%	40%	100%
1994	17%	79%	76%	73%
1994	36% (PSU 1218)	The final examination had not been held at the time of the research study.		

*Source: Open University Data 1994*

### **The background knowledge in the subject area prior to enrolment**

When students were asked about their initial level of knowledge of the subject prior to registering for this course, most of them stated that they had some basic knowledge of the subject before enrolling for the course. Cumulative percentages showed that more than 69% of the students had known most of the subject matter before they started the course. Only 1% stated that the concepts were new to them (Figure 2).

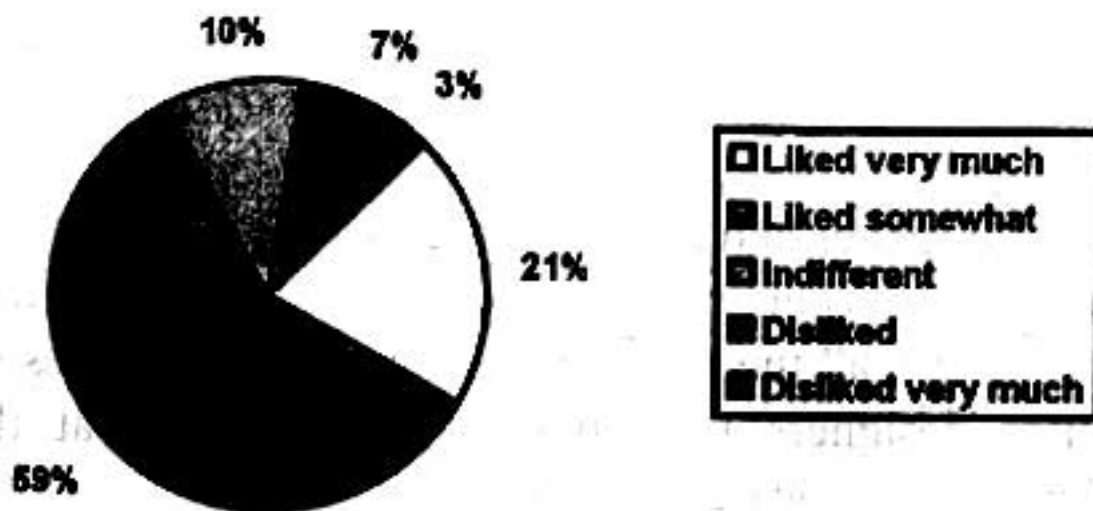
**Figure 2 - Background knowledge in the subject prior to enrolment**



### Degree of Interest In the course

When asked whether the course was interesting, 80% responded that it was interesting while 10% indicated dislike and 10% were indifferent. Figure 3 gives the percentage responses for each category.

**Figure 3 - Degree of interest in the course**



## Degree of difficulty In the course

Students were asked to respond to the degree of difficulty in the course in five categories viz. 'very difficult, fairly difficult, neutral, fairly easy and very easy'. About 53% of the students rated it as a 'difficult' course while 5% found it very easy (Figure 4).

Figure 4 - The degree of difficulty in the course



## Workload of the course

Table 3 indicates the estimated study time for the whole course. In this instance, the calculation for the course material was based on 'study rates' which refer to the reading in relation to comprehension, rather than mere reading speeds. According to Kulatunga et al. (1995), a lesson usually contains 2500 - 3000 words or approximately 10 pages and a student is expected to spend two hours of study time per lesson. It was assumed that the students would manage to complete all the exercises and practical activities specified by the course designers for laboratory classes and at the 'mini museum' during the allocated time period.



*Table 3 -Estimated Study Time for the Animal Diversity course*

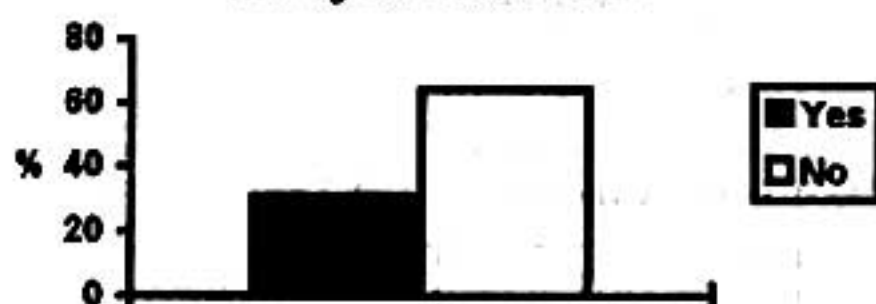
<b>Component</b>	<b>Activity x no. of hours</b>	<b>Estimated study time</b>
Course material (pp. 451)	45 lessons x 2	90 hrs
Laboratory manual (pp. 39)	4 lessons x 2	8 hrs
Workbooks (pp. 72)	7 lessons x 2	14 hrs
Day schools (3 days)	3 x 6	18 hrs
Laboratory classes (2 days)	2 x 6	12 hrs
'Mini museum' (2 days)	2 x 6	12 hrs
Estimated study time		154 hrs

Table 3 shows that the estimated study time exceeded the expected (ideal) study time based on the course developers' subjective judgement (i.e. around 150 hours for a 1/3<sup>rd</sup> credit course) only by four hours. It is evident that the time required for writing reports, studying for assignments, attending a field trip and referring recommended text books had not been considered in the allocation of time for the course. This indicates that the students were probably overloaded with work.

### **Reference done by the students**

When asked whether additional reference work was carried out during the study period, only 31% of the students answered in the affirmative. Figure 5 indicates the responses given by the students with regard to reading reference material.

**Figure 5 - Reference work carried out by the students**



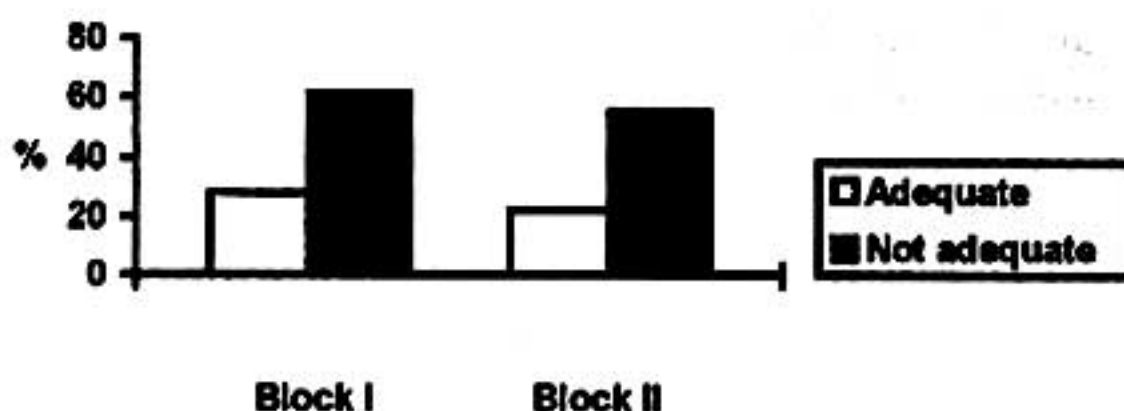
Most of the students (58%) said that they did not have adequate time to read the recommended reference material and to complete the course material. 4% commented on the nonavailability of the recommended books in the library. 3% had the opinion that they could pass the final examination without referring any text books other than the course material.

## Students' perception of course material

### Time factor

When students were asked whether they could read and understand all of the course material within the allocated time period, the majority responded negatively. Figure 6 shows that about 60% of the students could not complete all the course material within the allocated time period.

**Figure 6 - Time factor**



## Syllabus

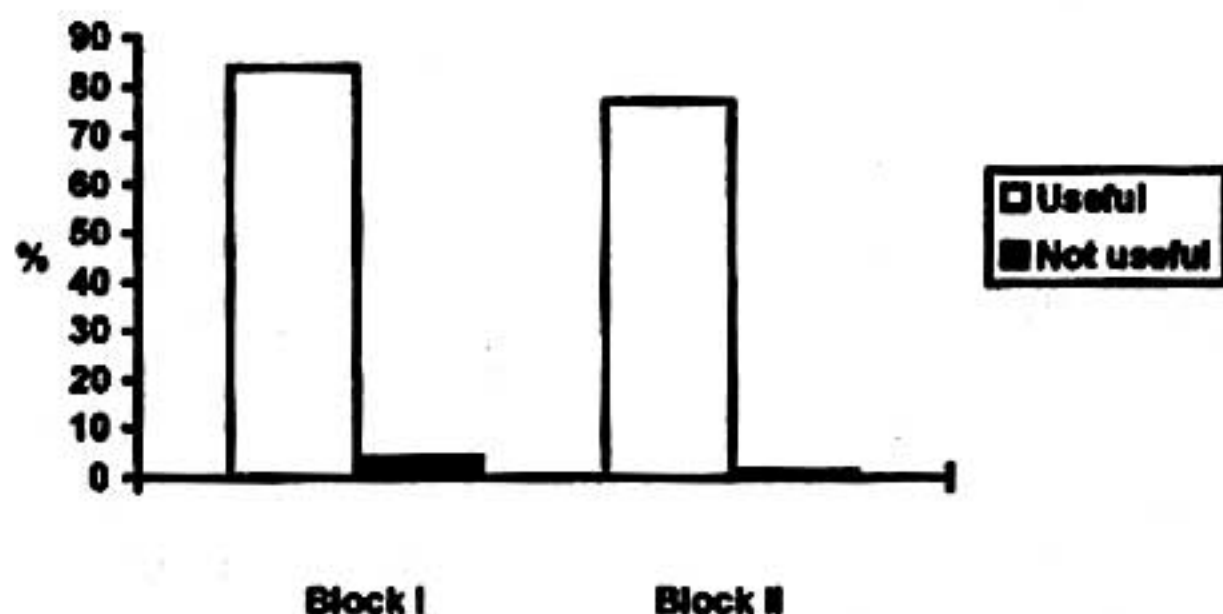
Majority of the respondents indicated that the syllabus of the course was very similar to the local G.C.E. (Advanced Level) syllabus and commented that the course contained outdated information.

## Layout and Presentation

### *Layout*

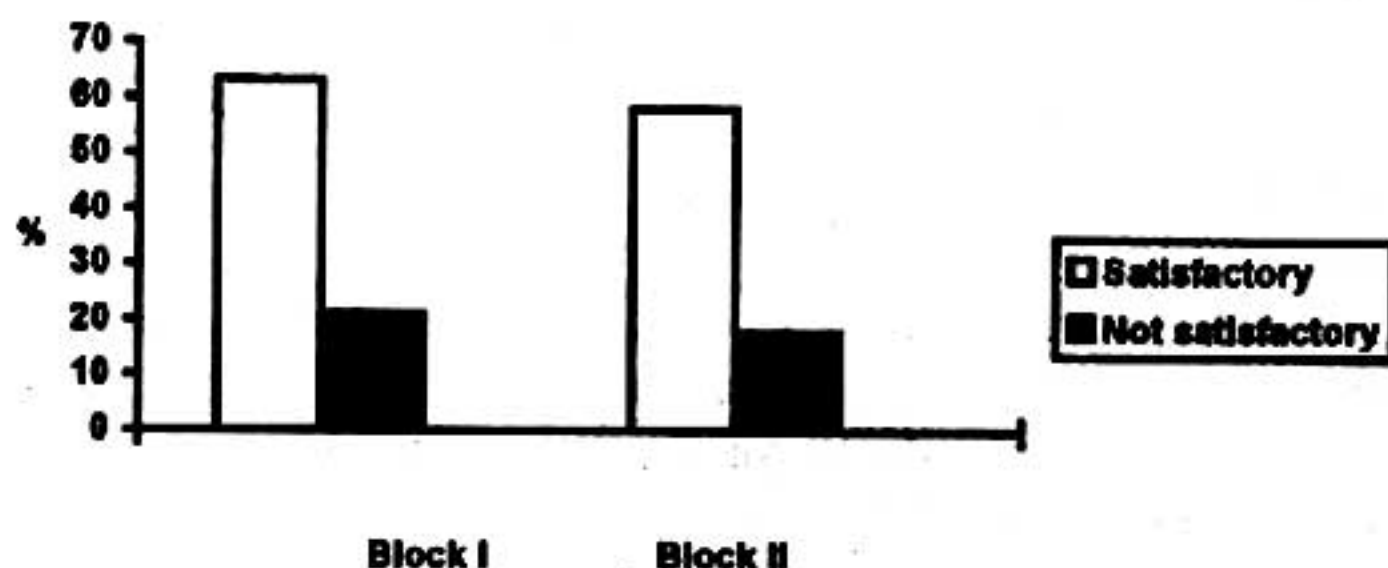
In the OUSL course material, a blank margin is given on the left side of the page to enable students to write notes and other references. When students were asked whether they were satisfied with this blank margin, over 75% expressed their satisfaction. A small percentage of students did not consider it to be important (Figure7).

**Figure 7 - Preference for the blank margin**



### *Presentation of the subject matter*

Figure 8 shows the responses regarding satisfaction with the presentation of subject matter. More than 60% of the students agreed that most of the subject matter was clearly presented in all the lessons. However they commented that in a few instances there was contradictory information presented within the course material. Furthermore, in some lessons, the concepts had not been clearly explained.

**Figure 8 - Presentation of the subject matter**

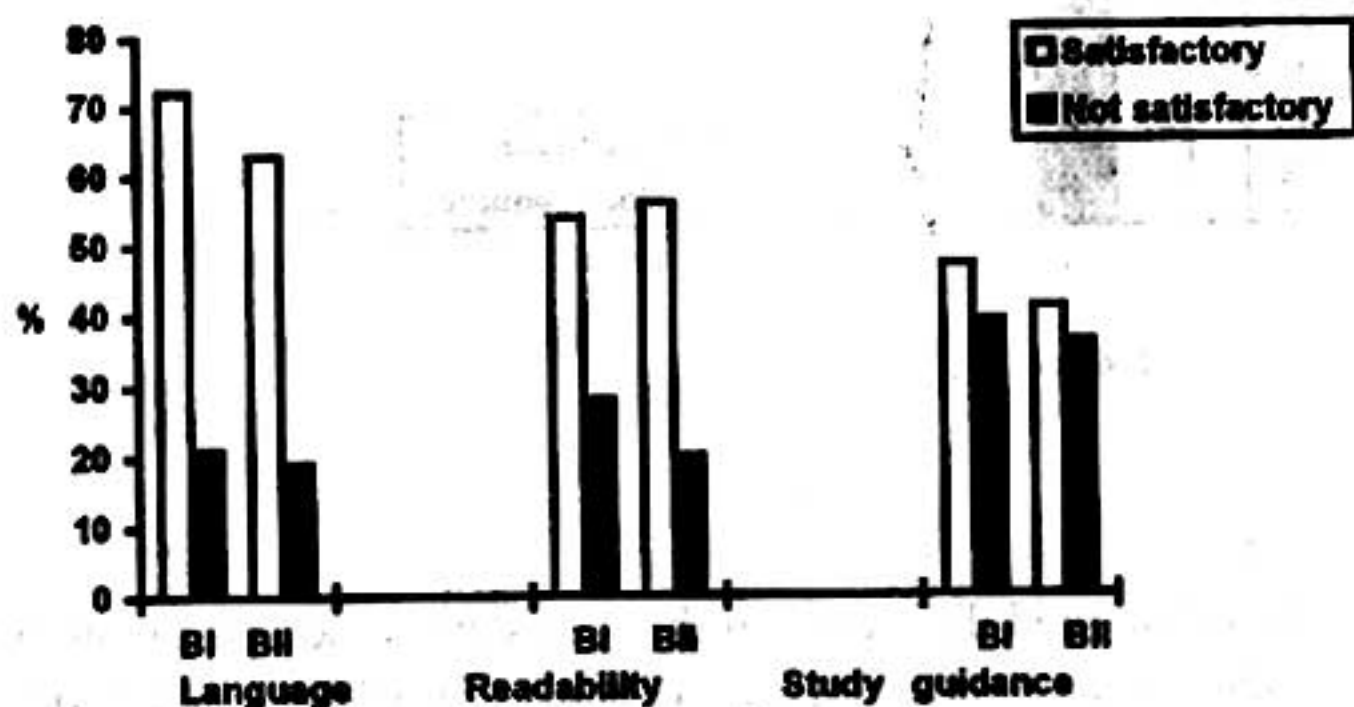
### **Language, Readability and Study Guidance**

When students were asked for their opinion on the language, the readability and guidance provided in the course material, most of the students agreed that the language used in the course material was satisfactory. However, approximately 20% said it was difficult for them to understand and grasp the issues explained in the course material (Figure 9). A majority of students who responded that the course was 'not easy to understand' were those who took the course either in the Sinhala medium or the Tamil medium. In some instances these students referred to the English medium course material to obtain the exact meaning, either by going to regional centres or by borrowing English medium course books from a fellow student.

55% said that they could read the lessons easily while 24% said it was difficult to read.

44% of the respondents revealed that the guidance provided by the course material was inadequate.

**Figure 9 - Language, Readability and Study Guidance of the course material**

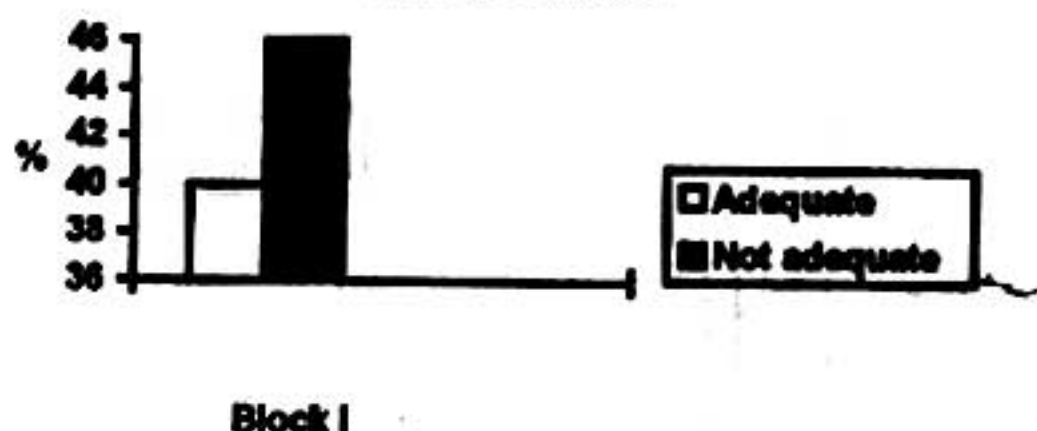


### Self Assessment Questions (SAQs)

When students were asked to comment on the Self Assessment Questions (SAQs) in the course material, the majority (over 67%) agreed that the SAQs were useful for their learning process. Figure 10 presents the responses on the usefulness of SAQs.

However, 46% of the respondents commented that the SAQs in block - I was inadequate (Figure 11). There were no SAQs in block II.

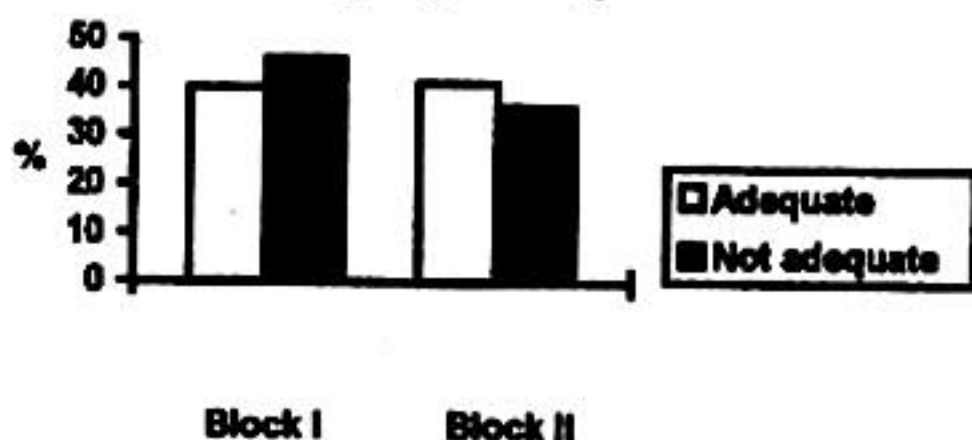
**Figure 11 - Students' responses on adequacy of SAQs**



### Diagrams

There was a marked difference in the views expressed on the number of diagrams in the course material (Figure 12). Block I and Block II include more or less the same proportion of diagrams. However 53% said that the diagrams were not adequate in Block I but were adequate in Block II. This observation might be related to the nature of the subject matter and the students' familiarity with this subject matter. Block I deals with invertebrates and students may have needed more diagrams to visualise these animals whereas Block II deals with the more familiar vertebrates.

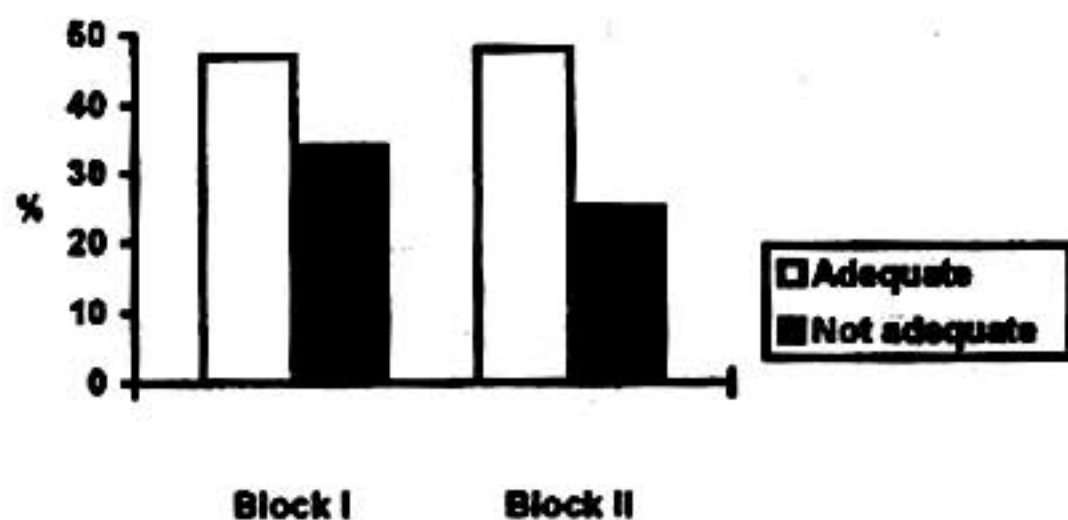
**Figure 12 - Students' responses on adequacy of diagrams**



## Examples

When asked for their views on examples in the course material, most of them were satisfied with the available number of examples. About 25% said they needed more examples and suggested the incorporation of local examples wherever possible. Figure 13 indicates their responses to this question.

**Figure 13 - Students' responses on adequacy of examples**



## Students' perception of Day Schools

Open ended comments from students regarding their views on day schools indicated that they needed additional day schools for this course. The majority of those who requested more day schools, preferred conventional lectures rather than discussion classes.

## Students' perception on Assignment Tests

Student comments on the Assignment Tests showed that the majority were not happy with the arrangement of the tests. They revealed that some of the open book tests had been conducted before the concepts had been explained at day schools. They also commented on the insufficient time gap between the first and second open book tests. In addition they said that they did not get any feedback on the assignments and therefore they found it difficult to assess their own progress.

## Students' perception on laboratory classes

Around 39% of the respondents said that the time allocation (only two days) for practical classes was inadequate to observe, study, apply their knowledge on exercises and to write reports during laboratory classes. They commented that they gave priority to completing the practical report and handing it over before the deadline. Hence they had very little time for the application of fundamentals during the laboratory classes - Figure 14.

**Figure 14 - Time allocated for the application of fundamentals during laboratory classes**

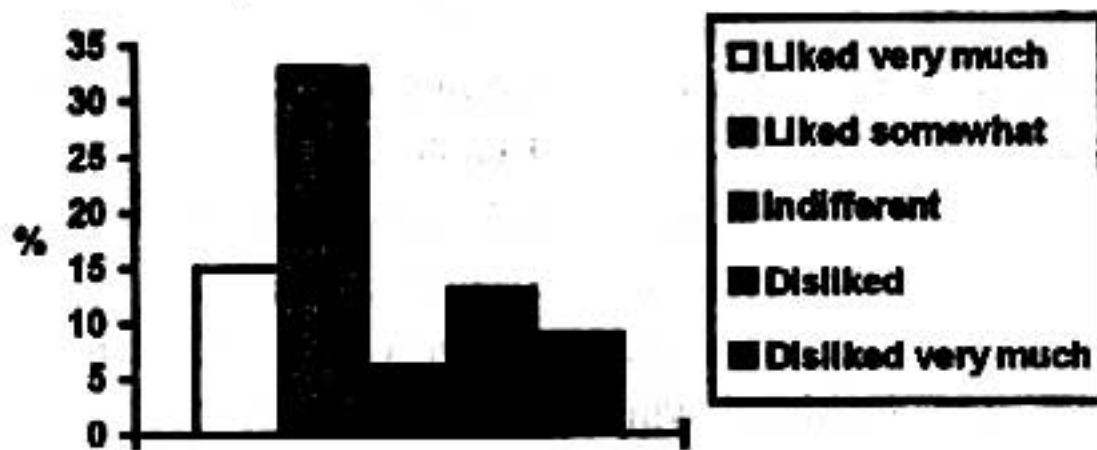


## Students' perceptions of the 'Mini museum'

When asked to respond on the adequacy of the 'mini museum', most of the students favoured the idea of having the 'mini museum' as an additional resource but they were not happy with the way it was conducted. Figure 15 presents the preferences for the 'mini museum'.



**Figure 15 - The degree of interest regarding the 'mini museum'**



The major problems they encountered in the museum were

- inefficiency of procedure adopted to allocate students to the museum
- inadequate working conditions
- inadequate number of slides, specimens and microscopes
- insufficient guidance and support from instructors during the session
- inconvenient time for returning the manual and lack of feedback on the manual.

## CONCLUSION

The study revealed that the Animal Diversity course was rated as a very 'difficult' course by the majority of students (See Figure 4). Student performances over the past years also confirmed this view as this course had the lowest pass rate among all Zoology courses at level 3. This may be due either to the students' partiality for the conventional type of teaching or to the inappropriateness of the course material as a self instructional text. This resulted in requests for more academic support and guidance.

It appears that the course was overloaded. As a result students could not accommodate all the academic activities such as report writing,

preparation for assignment tests, attending a field trip and referring recommended text books within the allocated time. Student responses also established that there was insufficient time for activities such as reading the course material, laboratory work, preparation for the assignment tests, and reference work. This raises concerns about the credit rating allocated to this course.

Chambers (1994) pinpoints that a study which does not allow time for thought, application or digestion does not constitute 'good learning'; it is unrewarding and has a demoralising effect on learners. In addition, the excessive workload will always affect the quality of learners (Chambers; 1992). This might have been one of the major reasons for poor performance in the course on Animal Diversity over the past years.

Overloading has been identified as the most important course related reason for drop-out at the OUUK (Woodley and Parlett; 1983). This reason might have been one of the causes for early drop-outs in this particular course. However, further research in this area is needed in order to come to any conclusions.

Feedback given by students on the day schools clearly pointed that they needed additional support to clarify the contents of the course material and raised doubts as to the self instructional nature of the course material. The material seemed to lack major key elements such as objectives, activities and feedback, appropriate language style, adequate illustrations, summaries and a glossary.

The major issues raised in this survey could be summarised into three main areas.

- management and delivery of the course
- workload of the course
- suitability of the course material as a self - instructional text

The following suggestions may help to resolve some of these issues.

- Most of the managerial problems associated with the course could be rectified to a greater extent by careful planning and changing the existing management strategies to suit the clientele.
- Providing infrastructure facilities for the 'mini museum' such as a more spacious room, equipment and specimens could strengthen it to a greater extent, as a long term measure.
- Reorganising the existing strategies that operate in the 'mini museum' and adopting methodical and flexible procedures to suit the distant learner could be considered as a short term measure.
- Sending marked assignments either with supportive comments or model answers well before the final examination would motivate and encourage the distant student to a greater extent.
- Workload assessment needs careful thought and it is necessary that course developers re-consider either changing the balance of the curriculum or reorganising/eliminating certain components of the course to suit with the distance learner.

The transforming of course material into a distance mode raises much concern, and it is up to the course developers to incorporate key elements necessary for self-instruction to facilitate students' use of text. This will make the course material more interesting and rewarding for the students.

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