An examination of the teaching of motor vehicle technology in colleges in the north east of England

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ABSTRACT

AN EXAMINATION OF THE TEACHING OF MOTOR VEHICLE TECHNOLOGY IN COLLEGES IN THE NORTH EAST OF ENGLAND

BY

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The main purpose behind this work was to try and establish why so many motor vehicle students in the North East of England, having embarked on a course of study, fail to successfully complete it.

Briefly, the correlated information indicates:-

(a) Students who found their way into the motor industry as apprentices had not, in general, been given sufficient careers advice, either at home or from outside agencies.

(b) It was also apparent that many of the students taking part in this work had obtained their apprenticeships by what can only be described as 'chance factors'. There is little evidence to support the view that 'constructive selection' is practised in the motor industry.

(c) It was discovered that those students who had been selected for technician courses, primarily because of their superior mathematical ability over their craft counterparts, were far less likely to have had previous employment, and were less likely to leave their college course prematurely.

(d) The majority of students taking part showed a willingness to participate in college administration, had very definite opinions on their lecturers and on the way courses should be organised and presented to them, and were far more constructive about these matters than lecturers anticipated.

(e) Lecturers, even when given clear definitions of intellectual levels, found it difficult to place specific objectives within these levels, particularly at the higher grades. Nevertheless even accepting a certain amount of confusion concerning the correct intellectual levels of objectives, the results obtained from student evaluation tests were

encouraging. The indicants were that specific objectives when used for lesson presentation and/or revision purposes enabled the students to score significantly higher than those students who had been taught and had revised in the traditional way.

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INTRODUCTION

This thesis is concerned with the question of course planning and in particular the teacher's role in the planning and implementation of courses. It is the intention of the writer to propose a 'systematic approach' to education and training. It is his belief that the ambiguities that exist in the interpretation of traditional syllabuses and in the presentation of material to students will be considerably reduced if a systematic approach is applied to course planning. Taylor (1970) observed that, in planning their courses, teachers may have found some parts particularly difficult. In addition they may have found themselves covering the same ground in different ways, or they may not have been certain what was appropriate in some areas. Nevertheless, they would have pushed on to complete the task, and only in some cases would they have reflected on their difficulties or on the nature of the process of planning in which they were engaged. Considering his observations, Taylor was led to comment that if teachers are more and more to be expected to be involved in the basic planning of courses and curricula, as seems likely, there is a need to make explicit the principles by which effective planning is achieved, and to communicate these principles so that they may become, in time, part of the professional expertise of all teachers.

It is also essential to take into account at the planning stage the attitudes, interests, aspirations and motivations of students for whom the course is to be designed. Moore (1971) put the view forward that, apart from an examination of curriculum content, colleges should also consider how they might change teaching and learning methods with a view to improving both the motivation of students and their ease of access to the system.

When talking about a "system", it is important first of all to clarify the use of educational aids such as projection or closed circuit television. Others define the 'systems approach' as the use of techniques of programmed instruction, and some would describe the 'systems approach' as the application of cybernetics to the training situation. Bearing these interpretations in mind Romiszowski (1970) comments that some others see the whole concept of systems and a 'systems approach' as a new jargon which has been conjured up to explain old ideas, invented (or at least promoted) by those who wish to obscure the fact that they are substituting talk for action. Neil (1970)points out that is is extremely important to distinguish between a 'systematic' and a 'systems' approach. When attempting to convince those who are not familiar with systems ideas, he favours proceeding with a systematic approach first, using a minimum of technical jargon, and only later progressing to more sophisticated ideas which may present very real problems in communication. Razik (1972) defines an instructional system as "an empirically developed set of learning experiences which are designed to achieve, with a given degree of reliability, a given outcome for a given class of learners" and that "the first step in analyzing a system is to describe as specifically as possible the ultimate goal of that system". Beynon (1968) summarizes the definitions of a system as a point of view to which is added a number of key ideas integrated into a logical pattern. Wales (1975) is of the opinion that the design of an educational system is no different from the design of any other complex operation; it requires a high level of professional ability, a background of appropriate educational and psychological principles and the ability to make decisions. The design process can be expected to follow the usual iterative pattern including steps such as (1) Identify a need. (2) State the constraints. (3) State the goals of the system to be designed. (4) Generate possible solutions. (5) Analyze, synthesize, evaluate. Heinich (1968) shares these views and produces the following two definitions of a system:-

(1) A system is the structure or organization of an orderly whole, clearly showing the interrelationships of the parts to each other and to the whole itself.

(2) An operational system synthesizes and interrelates the components of a process within a conceptual framework, ensuring continuous, orderly, and effective progress towards a stated goal.

Also sharing these views, Zifferblatt (1972) states that a systems approach helps us examine how all parts work together, or how they might work together to accomplish a specific mission or set of objectives. Immegart (1973) observed that the basic notion of a system, as revealed by all forms of systems theories is built on the input - output relationship. Gare (1972) describes how a navigating system has inputs of desired position and present position, and produces outputs of desired courses, leading to later positions. Therefore the main ingredients to ensure the success of the system are the inputs, the objectives, the process, and the outputs.

In this thesis a "system" is defined as a procedure whereby inputs are transformed into desired outputs. Although the system proposed is one that could be applied to any course, whether it be a new course or an existing course in need of modification. In this piece of research the writer is concerned with the implementation and organisation of motor vehicle courses, and in particular motor vehicle craft courses. The background to this work and the reason for considering craft courses as the chosen area of study is the inexplicable wastage of students attending these courses, particularly during the first year of attendance. As pointed out in the White Paper 'Better Opportunities in Technical Education' (1961) "there is serious cause for concern because so many students in further education do not complete their courses, or fail to pass the examinations at the end of them". The report continues and suggests possible reasons for this wastage; 'some students fall behind in their studies because of illness or for some other reasons, and cannot catch up again; others may start a course with good intentions but become distracted by other interests; others may be attending the college only because it is a condition of their employment. Some improvements could no doubt be brought about by more individual attention to students and other developments in teaching methods. But much could be done by providing a wider range of courses, by improving the methods of selecting students for courses, and by giving students more time to cover the necessary ground. Under the present system the prospect of failure is too great! Pilkington (1959) defined 'wastage' as referring to those students who do not obtain any recognised qualification at all by the time they cease attending a technical or commercial course. He went on to say that the placement of students into the right type of course at as early a stage as possible is undoubtedly the most important single factor in the prevention of wastage, and there is an urgent need for research and experiment in this area. The costs involved in educating and training apprentices are very high indeed and, at a time of high inflation, are likely to rise even further. But as indicated by Berg (1973) it is not easy to evaluate quantitatively the net gains and losses to employers and to the 'system' that accrue from high worker turnover, and other negative aspects of personnel policy. Lipshitz (1972) is of the opinion that the part-time nature of day-release courses increases the likelihood generally that many students may give up their studies, unless there are strong forces supporting their attendance. As a corollary 'drop outs' may turn out to be less interested in their work, and so place less value on the possession of a skill than those who persist with the course. Thomas (1967) thought that in technical education as in education at all levels evidence of unsatisfactory student performance was always a matter for serious concern and that there were many personal factors that could interfere with a student's ability to successfully complete a course of study. But the cause of a high failure rate or a large number of 'drop outs' on some courses can be sought in (1) ineffective matching of students to appropriate courses of study, and (2) faulty lecturing and examining techniques. Venables (1974) in her studies into the intelligence and motivation of day-release students, observed that colleges could only direct their students to courses which lecturers considered suitable within very definite limits. Such limits are frequently set by the firm which, having first selected its man, naturally reserves the right in many cases to say what course they wish him to pursue. Eyken (1971) also found that because of the close relationship between industry and technical education, exemplified by the day-release system, technical colleges are annually faced with the problem of deciding whether students selected for particular courses by firms are either capable of benefiting from such courses, or conversely, whether they are able to pursue courses of a higher standard. Eyken quotes Martin (1969) and Buzzard (1969) as being of the opinion that the existing system does not pay enough attention to the abilities, aspirations and needs of the individual student. Rugman (1971) when discussing these points states that the company will base its decisions on the needs of the business and the ability of the individual, and that there is a potential conflict between the company's needs and the individual's aspirations.

Proper selection procedures to appoint apprentices are obviously very important and an examination of such procedures is also looked at in this study because the writer is of the opinion that if the 'inputs' to the system are correct, then the chances of successful completion of a course of study are substantially increased. This view is shared by Richmond (1970) who puts forward the view that if selection procedures were perfect then failure rates should be zero. The less accurate the selection, the more the policy of testing ability 'on the job' can be expected to pay off, in terms both of doing justice to the applicant and of ensuring the highest standard for graduation.

In this work the writer is concerned with motor vehicle courses in the North East of England. The examinations for motor vehicle students in this area are set by the Northern Counties Technical Examinations Council at the first and second year stages. The City and Guilds of London Institute also set examinations for these students at the part 1, 2 and 3 levels. The success rate for students sitting these courses at the first year part 1 stage over a 3 year period are as follows:-

YEAR/ SESSION	NO. OF CANDIDATES COMPLETING EXAM.	NO. OF CANDIDATES QUALIFYING FOR AWARD	%
1976-77	676	494	73
1977-78	739	473	64
1978-79	765	520	68

[NORTHERN COUNTIES TECHNICAL EXAMINATION COMMITTEE REPORTS (1977) (1978) and (1979)]

It must be remembered that these numbers represent students who actually sat the examinations. The numbers of apprentices who left the course before its completion and thus did not enter the examination, are not indicated. If these were included, the percentage of students actually passing the examinations compared to those who enrolled on the course at the beginning of the session would be very low indeed. To emphasize this point the Darlington College of Technology, during the sessions 1974/75 to 1978/79 had the following results:-

FIRST YEAR CRAFT STUDENTS

PERCENTAGE PASS RATE COMPARED WITH NUMBER OF STUDENTS TAKING THE EXAMINATION

YEAR/ SESSION	NO. OF CANDIDATES COMPLETING EXAM	CANDIDATES QUALIFYING FOR AWARD	%
1974-75	36	28	78
1975-76	27	22	81
1976-77	84	60	71
1977-78	91	55	60
1978-79	88	53	60

PERCENTAGE PASS RATE COMPARED WITH NUMBER OF STUDENTS WHO ENROLLED

YEAR/ SESSION	NO. OF CANDIDATES ENROLLED FOR COURSE	CANDIDATES QUALIFYING FOR AWARD	%
1974-75	53	28	53
1975-76	43	22	51
1976-77	99	60	61
1977-78	104	55	53
1978-79	110	53	48

THIS REPRESENTS:-

1974-75 53 - 36 = 17 students = 32% loss/wastage

1975-76 43 - 27 = 16 students = 37% loss/wastage

1976-77	99 - 84 = 15 students = 15% loss/wastage
1977-78	104 - 91 = 13 students = 12.5% loss/wastage
1978-79	110 - 88 = 22 students = 20% loss/wastage

This indicates an average loss/wastage over the past five years of 23.3%. An approximate average of 727 students take the Northern Counties examinations each year, therefore, if this yearly loss of 23.3% can be taken as typical in the Northern Region this would indicate that a possible total of 221 students who start motor vehicle courses fail to complete even the first year of their studies.

Darlington College of Technology obtains results similar to the national average, but when the total enrolment of students is compared with the numbers actually passing the examination, the results are not very encouraging. Following discussion with course tutors engaged in motor vehicle work, and following some preliminary investigations into students'attitudes to their courses, it became clear that a certain amount of dissatisfaction existed with the way the craft courses are planned and presented. On further investigation, it became apparent that there was little agreement amongst the tutors as to the treatment required by the various topics as presented in the syllabuses, as well as to the order in which the topics were presented. Some teachers adhered strictly to the published syllabus order, and others attempted to present students with sequenced topics. It became quite clear that this would be a fertile research area in the hope that the method of presentation of craft courses would be improved and the ambiguities that exist in the syllabus as published might be eliminated.

Unfortunately the way in which examining bodies traditionally present courses exaggerates the already difficult problem faced by teachers of knowing what the students are expected to learn, and how best the subject can be taught. This is highlighted by Frankland (1969) who points out that examining authorities give very little guidance to teachers. He goes on to explain that in a dynamic system of technical education, the simple presentation of courses as groups of subjects each subdivided into lists of topics is inadequate to solve the teacher's real problems in the classroom or laboratory. This view is shared by Rudd (1973) who claims that the curriculum prescribes (or at least anticipates) the results of teaching; but it does not prescribe the means that is to say activities, materials or teaching content to be used in achieving these results. The sequencing of topics is obviously important and the method adopted in this work is the approach described by Williamson and Reece (1975). In their paper the argument put forward is that the traditional single linear model of the syllabus gives no information, by itself which will enable the teacher to decide on the relative importance of the weighting of each topic, or the optimum location of revision periods and tests for feed back practice, motivation or continuous assessment purposes. To overcome these problems the use of topic precedence diagrams (T.P.D.) is explored. These are designed to incorporate 'best times' and 'indicants' of the information required for successful course planning. But as Lumsdaine (1968) points out, sequencing is not just an a priori intellectual analysis of subject matter: it must be student orientated. This is not merely an attempt to guess what the students' difficulties will be, but a much more searching forecast of the real bases of these difficulties. In the design of motor vehicle craft courses, individual student operations and the times for these operations are not specified in detail. This is a weakness of the courses, and clearly indicates a need for re-design. This design should include meaningful instructional objectives, the word 'meaningful' being of paramount importance for, as observed by Beard (1972), when a 'satisfactory' classification is found, a different but very real problem is that the nature of the objectives themselves may not be agreed by colleagues in a single department. It is therefore necessary to recruit as much help as possible when writing objectives, and there is a requirement for as many people as practicable to read the proposed objectives before they are published.

The research work contained in this thesis consists of the following:-

1. A questionnaire on students' attitudes and opinions with regard to;
   (a) course content,
   (b) the way in which courses are presented to them,
   (c) the teaching staff with whom they have contact,
   (d) their employment and environment.

2. A questionnaire on course effectiveness, the purpose of which is to find out, prior to some course redevelopment, what opinions lecturers have on the way courses should be presented and how teachers interpret students' attitudes and opinions.

3. A 'classification questionnaire' the purpose of which is to highlight the ambiguities which exist in the way college lecturers interpret course topics.

4. (a) A test, for the purpose of comparison, which was given to two randomly selected groups of motor vehicle craft students, one group having the topics contained in the test presented to them objectively, the other group being taught the topics in the traditional way.

   (b) This approach was also used in the teaching of a number of motor vehicle C.S.E. Mode 3 students who attend college linked courses on one half day per week. The reason for the choice of link students for these tests was that it was thought unlikely that these students would have prior knowledge of the topic areas they were taught, and that the grasp of these topics after instruction would be due entirely to the lessons they had attended, and not to some other outside body, which could possibly be the case with a craft student coming to college one day per week from a firm.

For items (1), (2) and (3) students and staff from several North Eastern colleges helped in the completion of the appropriate questionnaires.

For items (4a) and (4b) students attending motor vehicle craft and C.S.E. courses co-operated in taking part in the various tests. As pointed out already, instructional objectives are not used to teach craft courses at the present time and it is the writer's opinion that, if a systematic approach incorporating the features discussed were used in planning and teaching of craft courses, the consistency of student attendances and the examination pass rate would be considerably improved.

The measurement and evaluation techniques used for questionnaires involved with opinions and attitudes of teachers and students are the (i) means, (ii) standard deviation, (iii) correlation of responses.

In the case of the classification questionnaire, comparison with expert opinion was made. For the criterion referenced evaluation tests, the measurement instrument used to judge the statistical significance of the mean difference is the 't' test.

Before proceeding it seems appropriate to reflect on the words of MacKenzie (1970); 'the long term effect of adopting a systematic approach to teaching problems is likely to be a growing professionalization of the teaching role in higher education. By making teaching itself subject to research and development, it is likely to raise its status. Contributions to the improvement of teaching may become readily recognizable and much work in this area could be publishable. The range of skills used in teaching is also likely to increase and there may be some specialization in order to enable teachers to make the kind of contribution for which they are most suited'.

CHAPTER 1

REVIEW OF LITERATURE

The introduction of the systematic approach to course planning and the implementation of courses has been discussed by many educationalists. Stolurow (1961) is of the opinion that, more than ever before, efficiency in instruction should be paramount. He indicates that, in the past, many approaches have been proposed, but they have all been too limited in nature and, in some respects, have been aimed at treating the symptoms rather than the basic problem itself. Some examples of this type of approach are manipulation of the teacher/student ratio, lengthening the school year, or providing the teacher with a bewildering array of so-called aids. Genuine instructional efficiency might be achieved, according to Stolurow, if an integration of learning and instruction as provided by the systems concept, coupled with a direct effort to implement the emerging modern learning theory were to be built into the instructional system. Bratten (1969) defined the systems approach to education as an attitude or conviction that such educational processes as instruction, administration, counselling, scheduling, curriculum design, and academic government, should be viewed as systems. Carter (1968) points out that one problem is the well-intentioned resistance to the introduction of technology into the educational process that stems from concern that it will dehumanize a very human process. In part, this is based on the notion that teachers will be replaced by machines, that education will be automated and the human, personal, and individualized quality and purposes of education will be lost. What is often overlooked is that the human quality and the genuine personal touch is often lost without automation. Technology will assist and support many educational functions, thus increasing the productivity of the teaching force and freeing it from the multitude of clerical, record keeping chores and the elementary task of simply presenting information for student consumption. This could help to restore the personal touch to the educational process.

Lieberman (1968) states

'Just why we accept the need for a systems approach to putting a man on the moon but not for educating millions of persons annually is an interesting paradox. The mythology that sustains the paradox includes the notion that technology will dehumanize education, that it will transform teachers from professionals into mere technicians, and that it has no use or relevance for the value oriented aspects of education'.

The need for systematic planning in the education and training of students, using fully the knowledge and techniques available, is being increasingly recognized by teachers, for as Platt (1962) indicates, not only do we wish to teach our students by the most efficient methods available but also, because of the ever-present, ever-rising annual expenditure on education, there is obviously a need to employ in education the most efficient planning methods and the most efficient methods of decision-making.

Odiorne (1970) points out that

'The new orientation in training, towards behavioural technology is a consequence of the systems approach to training. It requires some hard criteria for training and the management of the total behaviour change environment'.

Odiorne explains that the systems approach to evaluation of training starts with a definition of behaviour change objectives sought through a conscious development effort. This definition then remains a yardstick for measurement throughout the course, and achievement against the stated goals is the measure of success. Certainly the systems approach to training would be far more acceptable than a situation that led Deterline (1964) to state "generally speaking the product of our formal educational institution, through college, is not a liberally educated student but a sparsely educated one. Instead of turning out 'free minds', we produce unliberated, undisciplined slipshod thinkers whose primary educational distinction is the impressive way that they have slipped through 12 to 16 years of instruction without thoroughly mastering any subject."

Gagne and Briggs (1974) comment that the "systems approach" to the design of instruction is based, on one hand, on logical, systematic thinking and planning, making use of all theory and research evidence available, and, on the other hand, upon empirical testing and fact finding. The combination of systematic thinking, use of theory, use of facts from evaluation studies, and recycling, represents an improvement over earlier ways of planning for instruction. Gagne and Briggs continue to explain that the entire procedure, while lacking the elegant precision and predictive power of physical science, is closer to a science of education than are other approaches to the design of instruction. It is not contended that a highly intuitive approach is always inferior to a systems approach, since planners vary in both their intuitive powers and in their systematic planning efforts. However, what the systems approach does make possible is a verification of whether or not the system has achieved its objectives, that is, whether students performance shows that needs were met. This provides the basis for an accountability system by means of which educators can report to the public the extent to which design objectives have been attained. Tanner (1971) suggests that planning is not an end in itself but rather a means to an end, and that hopefully this end will be an improved educational climate, educational planning being an intellectual system involving the development of well defined design, the main purpose of which is to achieve objectives. Hirst (1974) add weight to this argument in putting forward the view that for curriculum planning to be rational, it must start with clear and specific objectives and then, and only then, address itself to discover the plan of means, the content and method in terms of which these objectives are to be obtained. For any particular curriculum, in deciding what objectives are to be involved in making value judgements of immense complexity and importance, we must get clear precisely what it is that we think is of value, characterising it with the greatest possible precision. Drucker (1974), when talking about difficulties of the system's structure, considers that the requirements for the system's structure to work at all are exceedingly stringent. It demands absolute clarity of objectives. The objectives themselves may well change, and change rapidly. But at any one time they must be clear and the objectives for the work of each member of the system must be derived from the objectives of the whole and be directly related to it. In other words, the system's structure can function only if the job of thinking through "what is our business and what should it be" is taken and performed with excellence, and then it requires that operational objectives and strategy be developed with great care from the basic mission and purpose. Anderson (1977), when referring to a commercial enterprise, states that a system's outlook and a systematic appraisal is essential for effective business operations. He believes that the prime reason for the initial implementation of a system is that it is deemed to have a useful purpose. A system without a useful purpose should not remain in existence as it employs resources which could be used to greater advantage in other operations of the business. A system, to serve a useful purpose, must be goal orientated which means it must have defined objectives. 'Crucial to a system's approach is agreement, by all persons viewing the system, on a definition of effectiveness'. Richmond (1970). All systems have an input and an output. No one doubts that the monetary inputs into the educational services have escalated in recent years. Instead of assuming that the more money we pour into the educational system the better its services will be, might it not be wise to be clearer about its outputs? And does the belief that education is a Good Thing relieve us of the obligation to do what we can to clarify objectives?

CONSTRUCTING A LEARNING SYSTEM

Stones (1969) found by survey that the predominant teaching method employed in colleges of education was the straight forward lecture. He observed that one of the problems had been the tremendous expansion in these colleges and lecturers had not had the time to assemble new ideas or to bring their methods of teaching into line with current thinking. Lecturers encouter a conflict between what is in operation and what some of them feel they ought to be operating. When introducing new methods of instruction or indeed redesigning established methods, the intention must be to introduce an intellectually consistent procedure that can be used systematically on the part of teachers or those involved in the process of course planning. Hollins (1964) explains that those concerned with and involved in the training of teachers too frequently find themselves so immersed in the day-to-day problem of organization, administration and teaching that they seem to have little opportunity to stand back from their work and attempt to view it in its totality. For, as McFarland (1964) points out, the idea of systems implies decision making with regard to the interrelationship of its various parts. If one point is changed, changes can be expected in other parts of the system. Gagne (1974) recommends that we adopt the assumption that instructional planning must be for the individual, as we are not here to be concerned with "man" changes in opinion or capabilities. He is also of the opinion that instructional design has phases that are both immediate and long range and that design in the immediate sense is what the teacher does in preparing a "lesson plan" some hours before instruction is given. The longer range aspects of instruction design are more complex and varied and they are more likely to be concerned with a set of lessons organised into "topics", a set of topics to constitute a course or course sequence, or perhaps with an entire instructional system. A final assumption made is that systematically designed instruction can greatly affect individual human development. Sessem (1974) is also of this opinion and sees the systematic approach to education as providing both a psychological framework of the individual person and a series of constructs that bring together the individual, the educational institution and the community at large, so that a programme of management education may be devised to develop the whole person in the context of his surrounding community.

CHARACTERISTICS OF A SYSTEM

There are two characteristics of the systems approach to instruction, Davies (1974). Firstly, the systems approach consists of a particular point of view towards the teaching - learning process. The teaching - learning process is an arrangement whereby a teacher and student can interact with one another. The specific purpose of this interaction is to facilitate student learning. The second characteristic of the systems approach is the use of a specific methodology for designing learning systems. This methodology consists of systematic procedures for planning designing, carrying out and evaluating the total process of learning and teaching. It is directed at achieving specific objectives and is based on research in human learning and communication. Applying this methodology will produce a learning system which arranges human and non-human resources in an efficient manner to bring about efficient student learning. Thus, because the systems approach is both a point of view and a methodology, it provides a guide for planning instruction and for carrying out the plan. Stenhouse (1975), when talking about methods, expounds the view that teaching is not merely instruction but the systematic promotion of learning by whatever means. He prefers the term 'teaching strategy' to 'teaching method' because teaching strategy hints more at the planning of teaching and learning in the light of principles, and it seems to lay more weight on teacher judgement. It involves developing a policy and putting that policy into practice. Stenhouse, is also of the opinion that the process of systematic curriculum development rests on the development of general statements of aim into more specific behavioural objectives. Great store is set by precision. Bell (1962) indicates the following as the characteristics of a system:- First of all, dynamically, a system may be viewed in terms of information flowing and being recorded, processed, summarized, used, stored and discarded. Secondly, a system is an assemblage of people, devices and plans for performing an administrative function, and thirdly, in order to judge the suitability of an existing or proposed system, a set of requirements is useful as a starting basis of inquiry. Summing up these points, Bell says that a system must (a) fulfil its purpose effectively (b) require minimum time to process each successive case (c) provide a complete set of plans (d) cost less than possible alternatives and (e) be adaptable to changing conditions.

DEFINITION OF A SYSTEM

Agreeing with many of the views expressed by Stones (1969), George (1969) expresses the opinion that the discouraging feature of our existing educational system is that it belongs to the last century, despite its high rating by world standards at all levels, including business and industrial education. He goes on to explain that we must start by asserting once again that our existing educational system is rigid and static in outlook and almost wholly outdated in method. The notion of classroom teaching is itself out of keeping with our understanding of how information processing can be most efficient. It is quite impossible, in general, for any one teacher to impart, information to a group of students at a rate which caters for the learning ability of each equally efficiently. Budgett (1969) expresses the urgency needed for a guiding concept for use in training personnel to view training design in a more critical manner. This naturally leads to adoption of the systems approach. Budgett's eight stages of documentation of the systems approach to training are briefly described as follows:-

1) Determination of operational requirements in detail by job analysis.
2) Determination of skill and knowledge element demanded by operational requirements by task analysis and specification of student population characteristics.
3) Derivation of training objectives expressed in student performance conditions and standards.
4) Specification of criterion measures to be used to check on student achievement of derived training objectives.
5) Synthesis of training design documentation in the form of lesson specification and procedures.
6) Implementation of the programme in accordance with the training strategies decided upon.
7) Presentation of validation statistics in terms of student

achievement of the training objectives for assessment of effectiveness of training strategy.

8) Provision of evaluation data to check relevance of derived objectives.

'A systems approach heps us to examine how all these parts work together or might work together to accomplish a specific mission or set of objectives'. Zibberblatt (1972) as defined by Gare (1972), a system is a set of elements which, with some objectives, uses processes to transform inputs into outputs. Agreeing with Gare, Hodge (1969) voices the opinion that in order to define the changes from input to output, it is first necessary to define the input characteristics, the output characteristics and the system goals and objectives (or standards of acceptability). This assumes that (a) the characteristics are measurable, and (b) that the measures used are valid and reliable. It also assumes that the system objectives can be clearly identified, since one cannot adequately assess achievement of standards if the standards themselves are inadequately defined. The inputs to a training system are trainees with certain characteristics: I.Q., education, experience, but more importantly an inability to perform as required on the job whatever that may be. Other inputs include the nature of the training problem itself, experiences of the training management in the widest sense and the resources available for solving the training problem. The outputs are trainees performing on the job. The most important processes in the system are training courses, on the job experience and training development, designing and producing training courses and other training experiences.

Wales (1969) observed that research in educational psychology has shown that the three most successful methods of improving educational systems are: (1) to determine the characteristics of the student input to the system; (2) to establish content performance objectives for the system; and (3) to observe and measure the behaviour of the teacher as he interacts with the students and the materials. Wales considers the characteristics of the student input to the system to be important because the system must be designed to build upon a certain foundation. If that foundation is not present, even the most beautifully designed system must fail. The content - performance objectives are extremely important because to a large extent, they dictate the materials, process operations and evaluation techniques that will be used in the system design. The third method of improving the system is based on the proven concept that the teacher can be more effective in his classroom if he understands both what he is doing and the effect of what he is doing on his students.

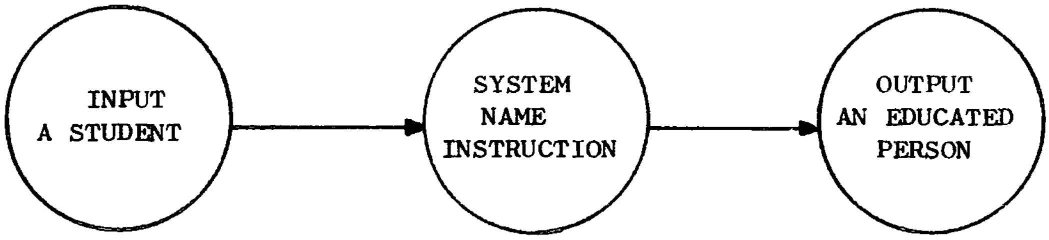
Thompson (1971) identified the systems concept of instruction in a model form as follows:-

NAME - Instruction

INPUT - A student

GOAL - An educated person

OUTPUT - An educated person



Thompson liked to think of the input as A student because of his conviction that, as nearly as possible, the system of instruction should be designed for one learner at a time. Such a restriction may seem wildly impossible and absolutely prohibited by financial constraints, lack of personnel and unavailability of suitable materials for instruction. But individualization of instruction is of such overwhelming importance when one considers the total system/goal mechanism that it must remain the ideal, and the systems designers and managers must continue to exert effort in this direction.

Referring to Thompson's model, the goal of the system is the projected end product and ideally the goal and the output are identical, If this is not the case and the output of the system does not meet up with the goals of the system there are obviously design faults, or perhaps the goal is too ambitious or unrealistic for the students in question.

Edney (1972) argues that the output, or the type of data required to be produced by the system will have been defined before any input or processing of data can take place. It will depend entirely on the data required by the user. Until this definition has been given the processor cannot produce the required output. Hirst (1973) also puts forward the view that rational consideration of a curriculum demands clarification of the ends prior to determination of the appropriate means, for without a grasp of the ends, the significance of the means as means cannot be grasped. Finch (1976) describes input - output analysis as a technique which is used to discover how changes in one, or more than one output flow in a static or dynamic supply and demand network are shared over the various users (input flows).

It can be seen from this that the processing stage and the output stage are dependent upon each other and that, as Mager (1967) explains, the systematic development of instruction involves the detailing of specifications of the desired result, the development of an instrument by which success can be measured, development of procedures, lessons and materials to achieve the specified results and the steps necessary to ensure the continued improvement of course effectiveness. Mager argues that the systematic approach to instruction has essentially three phases of procedure and also three phases of instructional development, these being:-

PROCEDURE

1) Determine and describe what are the desired achievements.

2) Do what is necessary to achieve the desired result and

3) Check to see that the end result is a successful completion of the original aim.

DEVELOPMENT

1) Deriving and describing the objectives in meaningful form.

2) Developing lessons and materials designed to meet these objectives and trying out the course, and

3) Determining how well the objectives were achieved and improving the course to improve the results.

Regardless of subject matter the object of all vocational instruction is to send the student away (1) capable of performing satisfactorily on the job and (2) capable of improving his skill through further practice.

MacKenzie (1970) also found it useful to consider a course as a system in which students, teachers and learning material interact. The purpose of course development, he maintains, is to optimize the system. This approach to course development considers several aspects. Firstly, development could take place to improve overall course efficiency by reduction of costs but maintaining the same quality of output. Another aspect could be to improve course effectiveness by increasing the quality of student performance output. This could also be said to be achieved if the level of the course objectives were raised.

A summary of the components of this approach to the process of course development is as follows:-

1) The logistic input for the course itself and a list of the constraints affecting its allocation (this includes the operational costs allowed for the course, limitations on space, and personnel).

2) An estimate of the student input in terms of numbers and levels of attainment, (this may need to be made more precise in an early stage of the course development process).

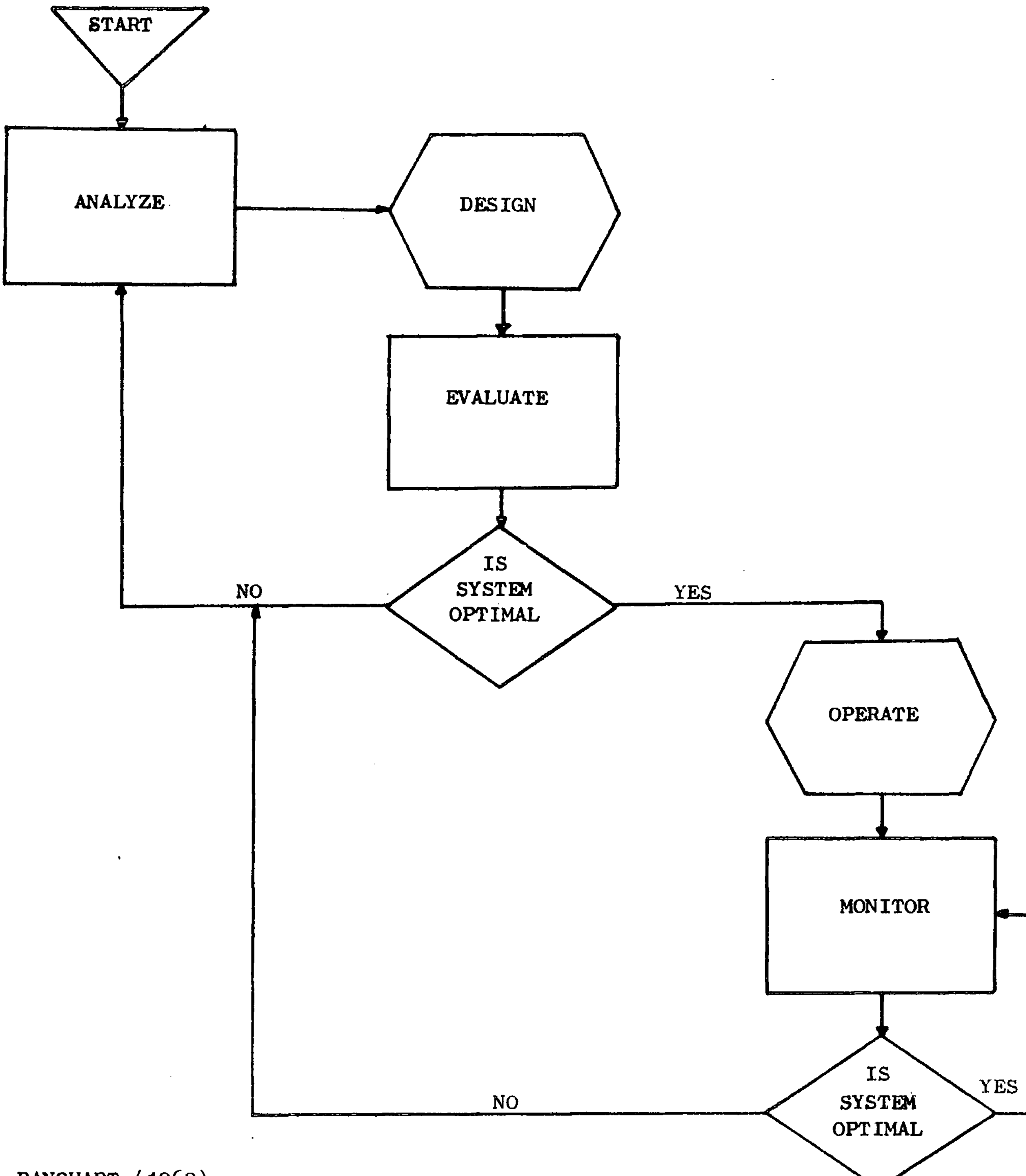
3) Guide lines on intended outcomes of the course (these also will need to be refined later).

4) Guide lines on what is to be optimized i.e. is the cost to be reduced, is the effectiveness to be improved or are the outcomes to be expanded to include more ambitious objectives?

5) A budget for the course development process itself, including the costs of the time to be contributed by each member of the course team.

6) A commitment to the use of formative evaluation for at least some part of the course, i.e., to at least one substantial revision.

Banghart (1969) indicates by a typical flow chart the continuous nature of systems work. When evaluation is made of a new design, the question is asked, "Is the new system functionally optimal?" If not, an additional analysis is made and the design is modified prior to a new evaluation. This process is continued until the new system is optimal.



BANGHART (1969)

Banghart claims that there is a series of steps through which one must proceed in order to accomplish a systems analysis. These are briefly:-

1) <u>Establish Objectives</u>:- The most difficult part of the entire systems study involves establishment of very specific objectives to be accomplished.

2) Review of Systems Operations:- The second step in systems analysis involves a comprehensive review of all the systems operations.

3) Collection of Data:- Following a review of the total system and isolation of the apparent problem area, the analyst begins to collect detailed data within the problem area.

4) The Analysis of Data:- Analysis of data is discussed separately from collection of data in order to point out the distinction between a systems analysis and the traditional experimental paradigm in research.

5) Isolation of the Problem:- The administrator does not always know precisely what the problem is. It is necessary to go through the systematic review, data collection, and analysis of data in order to determine the specific problem.

6) Specify Operations in the Problem Area:- Once the specific problem has been isolated, it is necessary to carry out a detailed comprehensive review of those operations within the problem area.

7) Block Diagram:- Prior to building a new design, one builds a block diagram of all functions of the subsystem that make up the problem area.

CHAPTER 2

THE CLARIFICATION OF AIMS AND OBJECTIVES

It has been the normal procedure in many organised courses to list topics in the form of a syllabus, giving little thought to outcome. The teacher is left to decide for himself the extent to which the topic should be taught and, at the same time, somehow relate his decision to his 'inspirational' aims such as 'developing a good service engineer'. The relationship between the syllabus and its aims remainsimplicit and individual.

MacKenzie (1970) states that the difference between an aim and an objective can be expressed in a number of ways. For example, we may consider an aim as a general declaration of intent which gives direction to a teaching programme and an objective as a particular point in that direction. Alternatively, an aim can be defined as an answer to the question of why a topic is taught and an objective as an answer to the question of what will have been achieved when it has been taught. By clarifying an objective we could be said to be describing a process of making explicit a problem which is normally implicit, the problem of deciding what to teach. Gallegos and Phelan (1974) spoke about industry's approach to training and the importance of ensuring that whatever is taught is relevant to the achievement of the desired behaviour in the trainee. Having decided what is wanted of the trainee it is then necessary to choose the best teachers, the best information, the best training aids and the best teaching techniques which will cause this change to come about. Gallegos and Phelan then explained that to specify the outcome of a training programme as a first step is really only stating your objectives and that objectives are what you wish to achieve through training.

Lawson (1974) observed that 'one of the essential dimensions in any type of instructional development involves the nature and characterization of the objectives to which instruction is addressed. The lack of identifying instructional outcomes and their subsequent utilization parameters is being investigated by a variety of agencies and individuals who contend that they have the best solution to the issue. Despite the ubiquitous attention given to the matter of identifying, analyzing and employing instructional objectives, the documentation of the resultant impact of such intensions on instruction and learning is generally wanting. Summer (1969) formulated a list of aims which he intended to be suitable for a wide range of crafts, these being:-

(1) To develop pupils' and students' achievements progressively through a range of skills which employ physical and associated mental abilities.

(2) To discover abilities which lead to craft attainment.

(3) To initiate and develop a spectrum of techniques with hand and machine tools, which will enable the pupil to re-structure appropriate materials in the creation of products.

(4) To provide an environment in which purposeful creative activity will flourish.

(5) To teach meaningful technology, craft and social history, and aesthetics so that a student arrives at concepts which give his work a context in which he can be his own judge.

(6) To employ the processes of material usage and related design concepts in such a way that the student gains insights upon which to base judgemental criteria.

(7) To enable the student to judge which outcomes of crafts satisfy evaluative criteria.

(8) To relate craftwork to conjoint disciplines so that evaluation embraces a variety of disciplines, and thus leads students to be aware of knowledge holistically in relation to contemporary society.

(9) To enable the diverse personalities of the students to make adjustments to society and the material environment by ways of expanding interests and attitudes in the area of craft related activity.

(10) To effectively assess the degree to which detailed objectives have been achieved, and determine their contribution to these overall aims.

'With no clear statement of objectives set out to guide them, teachers only too easily take the statement of the mere content of the curriculum or syllabus as a statement of the objectives to be pursued.' Hirst (1974)

Ennever (1969) thought it may help in understanding what objectives are if we emphasise what they are not. They are not the items in a list of things to do, and they do not make up a syllabus, although looking at a list of objectives may at first give this impression. In Ennever's opinion, objectives do not tell teachers anything about the materials or apparatus that should be used or about the experiments or activities that should be undertaken because all pupils do not necessarily have the same problems. Each objective can be achieved in many different ways, the choice being left to the teacher and whether or not the maximum potential is achieved in a given situation depends on the way in which the situation is managed.

An early attempt to categorize objectives was made in the United States by Bloom and his associates (1956) who wished to facilitate exchanges of information between educators about curricular developments and methods of evaluation. They began by collecting educational objectives from institutions and from literature, classifying them initially under the heading of knowledge, intellectual abilities and intellectual skills. Next they proceeded to make further subdivisions, placing cognitive objectives in order from the simplest to the most complex, attempting to categorise these sub-divisions in such a way that all those using their material could communicate with each other about the specific objectives as well as the testing procedures by which their achievements could be evaluated.

CLASSIFICATION

Bloom's Taxonomy: Cognitive Domain

1.0 Knowledge

- 1.1 Knowledge of specifics.
- 1.2 Knowledge of ways and means of dealing with specifics.
- 1.3 Knowledge of universals and abstractions in a field.

2.0 Comprehension

- 2.1 Translation
- 2.2 Interpretation
- 2.3 Extrapolation

3.0 Application

4.0 Analysis

4.1 Analysis of elements.

4.2 Analysis of relationships.

4.3 Analysis of organizational principles.

5.0 Synthesis

5.1 Production of unique communication.

5.2 Production of a plan or a proposed set of operations.

5.3 Derivation of a set of abstract relations.

6.0 Evaluation

6.1 Judgement in terms of internal evidence.

6.2 Judgement in terms of external criteria.

Numerous classification schemes have been attempted, many influenced by Bloom, an example, described by MacKenzie (1970), being Scrivan's 'Conceptual Description of Educational Objectives'. In this description, Scrivan has made one important addition in that he has identified three levels of description for educational objectives:-

(a) the conceptual level which is relatively abstract and is the level at which discussions of 'breadth V depth' and 'knowledge V comprehension' are carried out and the 'structure' of the course is outlined.

(b) the manifestational level which is concerned with ways in which a student's achievement of an objective can be demonstrated, and

(c) the operational level which defines an objective in terms of the precise means by which it is to be assessed.

Bloom (1964) found that most of the objectives stated by teachers could be placed rather easily into one of the three major domains or classifications. These domains or classifications, as described by Bloom, are:-

(1) COGNITIVE: Objectives which emphasize remembering or reproducing something which has presumably been learned as well as objectives which involve the solving of some intellective task for which the individual has to determine the essential problem and then re-order given material or combine it with ideas, methods, or procedures previously learned. Cognitive objectives vary from simple recall of material learned to highly original and creative ways of combining and synthesizing new ideas and materials. (Bloom found that the largest proportion of educational objectives fell into this domain).

(2) AFFECTIVE: Objectives which emphasize a feeling tone, an emotion, or a degree of acceptance or rejection. Affective objectives vary from simple attention to selected phenomena to complex but internally consistant qualities of character and conscience. (Bloom found a large number of such objectives in the literature expressed as an interest, attitude, appreciation, values, and emotional sets or biases).

(3) PSYCHOMOTOR: Objectives which emphasize some muscular or motor skill, some manipulation of material and objects, or some act which requires neuromuscular co-ordination. (Bloom found

few such objectives in the literature and when found they were mostly related to hand writing and speech and to physical education, trade and technical courses).

Gronlund (1970) observed that instructional objectives in the psychomotor domain typically include concomitant cognitive and affective elements, but the demonstration of a motor skill is the dominant characteristic of the student's response. This overlapping of behaviour from the different domains is, of course, not limited to performance skills. Learning outcomes in the cognitive area have some affective elements, and outcomes in the affective area have some cognitive components.

The following tables show the major categories in the Cognitive Domain of the Taxonomy of Educational Objectives Bloom (1956) and also the major categories in the Affective Domain of the Taxonomy of Educational Objectives Krathwohl (1964), together with examples of general instructional objectives and behavioural terms.

MAJOR CATEGORIES 'COGNITIVE DOMAIN'	ILLUSTRATIVE GENERAL INSTRUCTIONAL OBJECTIVES	ILLUSTRATIVE BEHAVIOURAL TERMS FOR STATING SPECIFIC LEARNING OUTCOMES
KNOWLEDGE	Knows common terms Knows specific facts Knows methods and procedures Knows basic concepts Knows principles	Defines, describes, identifies, labels, lists matches, names, outlines, reproduces, selects, states
COMPREHENSION	Understands facts and principles Interprets verbal material Interprets charts and graphs Translates verbal materials to mathematical formulas Estimates future consequences implied in data Justifies methods and procedures	Converts, defends, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, paraphrases, predicts, rewrites, summarizes
APPLICATION	Applies concepts and principles to new situations Applies laws and theories to practical situations Solves mathematical problems Constructs charts and graphs Demonstrates correct usage of a method or procedure	Changes, computes, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses
SYNTHESIS	Recognizes unstated assumptions Recognizes logical fallacies in reasoning Distinguishes between facts and inferences Evaluates the relevancy of data Analyzes the organisational structure of a work (art, music, writing	Breaks down, diagrams, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, points out, relates, selects, separates, subdivides

MAJOR CATEGORIES 'COGNITIVE DOMAIN'	ILLUSTRATIVE GENERAL INSTRUCTIONAL OBJECTIVES	ILLUSTRATIVE BEHAVIOURAL TERMS FOR STATING SPECIFIC LEARNING OUTCOMES
EVALUATION	Judges the logical consistency of written material Judges the adequacy with which conclusions are supported by data Judges the value of a work (art, music, writing) by use of internal criteria Judges the value of a work (art, music, writing) by use of external standards of excellence	Appraises, compares, concludes, contrasts, criticizes, describes, discriminates, explains justifies, interprets, relates, summarizes, supports

MAJOR CATEGORIES 'AFFECTIVE DOMAIN'	ILLUSTRATIVE GENERAL INSTRUCTIONAL OBJECTIVES	ILLUSTRATIVE BEHAVIOURAL TERMS FOR STATING SPECIFIC LEARNING OUTCOMES
RECEIVING	Listens attentively Shows awareness of the importance of learning Shows sensitivity to human needs and social probles Accepts differences of race and culture Attends closely to the classroom activities	Asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits erect, uses
RESPONDING	Completes assigned homework Obeys school rules Participates in class discussion Completes laboratory work Volunteers for special tasks Shows interest in subject Enjoys helping others	Answers, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes

CONTINUED

MAJOR CATEGORIES 'AFFECTIVE DOMAIN'	ILLUSTRATIVE GENERAL INSTRUCTIONAL OBJECTIVES	ILLUSTRATIVE BEHAVIOURAL TERMS FOR STATING SPECIFIC LEARNING OUTCOMES
VALUING	Demonstrates belief in the democratic process Appreciates good literature (art or music) Appreciates the role of science (or other subjects) in everyday life Shows concern for the welfare of others Demonstrates problem-solving attitude Demonstrates commitment to social improvement	Completes, describes, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works
ORGANIZATION	Recognizes the need for balance between freedom and responsibility in a democracy Recognizes the role of systematic planning in solving problems Accepts responsibility for his own behaviour Understands and accepts his own strengths and limitations Formulates a life plan in harmony with his abilities, interests, and beliefs	Adheres, alters, arranges, combines, compares, completes, defends, explains, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes
CHARACTERIZATION BY A VALUE OR VALUE COMPLEX	Displays safety consciousness Demonstrates self-reliance in working independently. Practices co-operation in group activities. Uses objective approach in problem solving Demonstrates industry, punctuality and self-discipline. Maintains good health habits	Acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, uses, verifies

EXAMPLES OF GENERAL INSTRUCTIONAL OBJECTIVES AND BEHAVIOURAL TERMS

FOR THE PSYCHOMOTOR DOMAIN OF THE TAXONOMY

TAXONOMY CATEGORIES	ILLUSTRATIVE GENERAL INSTRUCTIONAL OBJECTIVES	ILLUSTRATIVE BEHAVIOURAL TERMS FOR STATING SPECIFIC LEARNING OUTCOMES
(Development of categories in this domain is still underway)	Writes smoothly and legibly Draws accurate reproduction of a picture (or map, biology speciment, etc.) Sets up laboratory equipment quickly and correctly Types with speed and accuracy Operates a sewing machine skillfully Operates a power saw safely and skillfully Performs skillfully on the violin Performs a dance step correctly Demonstrates correct form in swimming Demonstrates skill in driving an automobile Repairs an electric motor quickly and effectively Creates new ways of performing (creative dance, etc.)	Assembles, builds, calibrates, changes, cleans, composes, connects, constructs, corrects, creates, designs, dismantles, drills, fastens, fixes, follows, grinds, grips, hammers, heats, hooks, identifies, locates, makes, manipulates, mends, mixes, nails, paints, sands, saws, sharpens, sets, sews, sketches, starts, stirs, uses, weighs, wraps

TECHNICIAN EDUCATION COUNCIL

(T.E.C.)

The Technician Education Council, in Circular TEC 6/75, gives indications of its requirements on the aims and objectives of programmes and units to be submitted for validation and the form in which unit content should be set out. It draws attention to the following passage in the Policy Statement: "A unit will be defined by the knowledge and skills to be attained by the student at its completion". In section 4.3.4 of this Circular, T.E.C. says that colleges submitting their own schemes for the Council's approval should provide syllabuses or lists of topics and the proposed method of assessment for each unit. This material should include the scope and learning objectives of the unit but will not necessarily represent the teaching programme. This policy has now been developed further and the council, in consultation with its Programme Committee, has decided that its aim will be to have all units written in the form of general and specific learning objectives in due course. T.E.C. envisages that, compared with traditional style syllabuses, the advantages of planning courses in this way will be as follows:

(a) Employers should be able to obtain a greater understanding and awareness of what is intended to be achieved as a result of each unit. This should not only aid consultation but also help employers to determine whether the programme is suitable for their staff.

(b) Teachers should find it of greater assitance in appreciating the depth of treatment intended for each topic. What is to be achieved should also be made clear, leaving them free to determine the most appropriate learning method.

(c) Students should be able to obtain an awareness not only of what they should be able to do as a result of each unit, but also of what is required of them during the assessment of their performance.

(d) The Programme Committee should find it easier to appreciate the depth of treatment proposed for each topic and so be able to gauge whether or not it meets the Committee's requirements for validation.

(e) Those responsible for assessing the student's performance will have detailed and unambiguous information on which to base their schemes of assessment.

OBJECTIVES AND TEACHER EFFECTIVENESS

'Those responsible for evaluating teachers have exalted procedures in teaching and have seldom examined the products, i.e. the efficiency of the teacher as indicated by what the pupils can do following instruction'. McNeil (1969). McNeil feels that, as public support of education increases, there will be greater insistence on judging a teacher in the light of his ability to enhance the learning of pupils. One way to do this is for a supervisor and a teacher to agree on which behavioural objectives are to be sought for particular pupils and what will be accepted as evidence that the teacher has or has not been successful in obtaining the desired gain. Bloom (1956) explains that, by educational objectives, we mean explicit formulation of the ways in which students are expected to be changed by the educative process; that is, the ways in which they will change in their thinking, their feelings and their actions. Mager (1961) states that an objective is an intent, communicated by statements describing a proposed change in a learner - a statement of what the learner is to be like when he has successfully completed his learning experience. It is a description of a pattern of behaviour (performance) we want the learner to be able to demonstrate. He goes on to say 'when clearly defined goals are lacking, it is impossible to evaluate a course programme efficiently and there is no sound basis for selecting appropriate materials, content, or instructional methods'. Another important reason for stating objectives relates to the evaluation of the degree to which the learner is able to perform in the manner desired. Tests or examinations are the mileposts along the road of learning and are supposed to tell the teacher and the student the degree to which both have been successful in their achievement of the course objectives. Mager (1968) asks the question 'what can you actually do to enable you to claim you have done your best towards the achievement of the objective of having the student leave your influence with as favourable an attitude towards your subject as possible?' Mager answers this question by saying that perhaps the best way to begin is to clarify the objective, and then identify the kinds of actions a student might take if the objective were achieved. Following that we should attempt to identify some of the practices that would help achievement of the objective. Finally, available procedures should be explored for checking instructions to see if any hindering condition has inadvertently been allowed to exist, and to see which helping conditions might be added to those already being used. Skilbeck (1971) maintains that the objective or criteria the teacher has in mind should refer explicitly to pupil learnings. The teacher's objective is satisfied when the pupil learns something in a certain way. It is not sufficient to have an intention which does not result in any discernible change in the pupils, although such intentions are not altogether rare in education. Skilbeck is of the belief that 'objectives' are better when understood and appreciated by students. As depicted by Baurne and Jones (1972) the major end product of a lecturer's effort is a student who, through his contact with the lecturer, has in some way changed. It is also believed that behavioural objectives, that is precise statements of the skills, knowledge and other attributes of the student at various stages of his learning, provide an essential tool for helping this process of change. Odiorne (1970) when talking about the systems approach to training indicates that this approach means moving toward an objective from some previous position which can be called training by objectives. It also means that training achieves objectives or should attempt to do so. This is a kind of discipline that liberates training from the many kinds of activities that it could become bogged down in, and make it purposeful, meaningful, economic, and possible to evaluate. DeCecco (1968) referred to educational objectives as broad goals and values which educational systems embrace and instructional objectives as the specific performances students acquire through particular instructional procedures, and that it is the teacher's job to convert educational objectives into instructional objectives. DeCecco put forward three points to indicate the importance of instructional objectives, these being:-

(1) By far the most important reason for using explicit statements of instructional objectives is the guidance they give to the teacher in planning his instructional procedures.

(2) A second reason for making explicit statements of instructional objectives is that they are useful in performance assessment.

(3) Using explicit statements of objectives pertains more to the student than to the teacher. If the student knows beforehand what he must learn in any given unit of instruction, he can better direct his own attention and effort.

Atkin (1969) thinks that there are overwhelmingly useful purposes served by attempting to identify educational goals in non-ambiguous terms. He contends that to plan rationally for a growing educational system, and to continue to justify relatively high public expenditures for education there is a need for a firmer basis for making assessments and decisions than now exists. Current attention to specification of curriculum objectives in terms of pupil performance represents an attempt to provide direction for collection of data that will result in more informal choice among competing alternatives. Hirst (1975) believes that a clear and logically accurate statement of objectives is necessary for curriculum planning. For Hirst, the fundamental objectives of education are cognitive in character. What is needed for effective curriculum planning, therefore, is an understanding of what is involved in the acquisition of knowledge. Hirst's contention is that knowledge is in fact differentiated into seven or eight distinctive "forms". Behavioural objectives will not universally suffice for curriculum planning since, though some objectives are logically behavioural, other more basic objectives in education are essentially covert. In those cases, "behaviours" could only be evidence for, rather than constituents of, the achievement of a rational mind. Hirst continues and adds that if curriculum planning is a matter of planning means to specified ends, and an educational curriculum therefore serves educational ends, the clearer we are about those ends and their nature the more adequate the planning can be.

In defining a 'teaching objective' Curzon (1976) has formulated the following 'a statement which describes what a learner will be able to do on completion of an instructional process known as a behavioural objective'. Thus we could state that; following an introductory lesson on the carburettor, the learner "will name correctly the different components of the carburettor";or that, following a unit of instruction relating to the industrial trade cycle, the learner "will describe in their correct sequence the events which make up a trade cycle". The naming and describing refer to types, or forms of behaviour from which one can observe whether the objectives of the lesson have been attained, or not, Taba (1962) explains that a statement of objectives should describe both the kind of behaviour expected and the content or the context to which that behaviour applies. Too often educational objectives are stated so that only the coverage of the content is explicit, and it is not clear whether this content is to be memorized, thought about, or acted upon to produce a change of attitudes. In other words, the expected behaviour is not specified. Objectives should be so formulated that there are clear distinctions among learning experiences required to attain different behaviours.

Agreeing with this view, Popham (1969) says that a satisfactory instructional objective must describe an observable behaviour of the learner or a product which is a consequence of learner behaviour.

McAshan (1970) is of the opinion that the clarity with which each behavioural objective is stated is of the utmost importance. The significance of such clarification is that the objective must not only identify the goal and the specific evaluation processes, but should also enable investigators of the problem area to write out procedures they will use in carrying out the proposed project. It is obvious that few, if any, behavioural objectives ever reach a state of perfection, but can be rewritten and improved indefinitely. Kibler (1974) claims that the value of instructional objectives to the teacher is dependent upon the level of instruction, the subject matter of the course, the nature of the school system, and countless other variables related to the instructional environment. He claims however that there appear to be at least two variables of objectives that remain constant in most teaching situations. These are (1) objectives prompt teachers to determine the most significant aspect of the subject matter to be learned and (2) objectives are an aid to teachers in establishing criteria for the measurement of classroom achievement. Eisner (1969) referred to instructional objectives as being used in a predictive model of curriculum developments. He explains that a predictive model is one in which objectives are formulated and activities selected which are predicted to be useful in enabling the student to attain the specific behaviour required. He also claims that, with instructional objectives, the teacher as well as the pupils are likely to focus upon the attainment of a specific array of behaviour and that the teacher in the instructional context knows what to look for as an indicator of achievement since the objective unambiguously defines the behaviour.

MOTIVATION

When considering the maintenance of achievement motivation during a course of instruction on topics or subjects, Gagne (1967) wrote that 'a valuable decision will be to keep students informed of the objectives of instruction and also of their achievement of these objectives. Achievement motivation cannot be effectively established unless the "mystery" of objectives is completely removed. "Why are we learning this?" is a question that always needs to be answered, as thoroughly and precisely as possible.'

Assessment exercises, or "tests" need to be employed at frequent intervals for the purpose of giving the student feedback about his achievement.

Probably the most skilled work that the teacher-manager performs, and certainly the most personal, lies in the guidance, encouragement, and inspiration which he communicates to his students. In this way, the teacher makes decisions on how the objectives can best be accomplished, communicates them to his students and then motivates then sufficiently so as to get them to accept responsibility for their own learning.

CHARACTERISTICS OF OBJECTIVES

Course objectives represent a clear statement of instructional intent and are written in any form necessary to clarify that intent. In practice, it will be necessary to have at least twice as many statements as tasks on the list. These statements will have the following characteristics:

(1) An objective says something about the student. It does not describe the textbook, the instructor, or the kind of classroom experience to which the student will be exposed.

(2) An objective talks about the behaviour or performance of students. It does not describe what the student is expected to know or understand. Though an objective might begin with a general statement such as "the student must understand the operation of the XYZ sewing machine", it would go on to explain what is meant by understanding by describing what the student will be expected to do to demonstrate the specific definition of understanding. In some cases the student may be expected to answer questions or to solve some problems or to describe a procedure or to construct a gadget. Whatever is meant by understanding would be defined in the sentence following the general one. In any case, an objective describes what the student will be doing to demonstrate his achievement of the instructional intent.

(3) An objective is about ends rather than means. It describes a product rather than a process. As such, it describes what the student is expected to be like at the end of instruction rather than the means that will be used to get him there. It talks about terminal performance rather than course content.

(4) An objective describes the conditions under which the student will be expected to perform in the absence of any assistance provided by job aids. In some cases such aids are acceptable, for example sometimes the student may be expected to solve problems with the use of a slide rule or calculator, and sometimes without these items.

(5) An instructional objective also includes information about the level of performance that will be considered acceptable. If a student will be expected to perform a task within five minutes at the end of a course, this will be stated as part of the objective. If his performance at the end of a course is expected to be error free or if some error will be tolerated, this will be indicated. In most instances, the decision about what performance will be considered acceptable is an arbitrary one. This is one place where the experience and wisdom of the instructor is most important, because specification of satisfactory performance is one of the unique contributions that can be made only by the skilled instructor.

Mager (1967)

CLASSIFICATION OF SKILLS

As part of this dissertation for the purpose of a classification questionnaire to test teachers' opinions, the writer has chosen the intellectual levels adopted by the Technician Education Council (T.E.C.) i.e. (a) INFORMATION (b) COMPREHENSION (c) APPLICATION (d) INVENTION.

INTELLECTUAL SKILLS (COGNITIVE DOMAIN)

Skills here reflect the intellectual processes presumed to be involved in tasks requiring thinking. Because of the different depths at which the thinking can occur, and also because intellectual objectives are those most likely to figure in unit specifications and so will constitute a significant factor in assessment, it is convenient to consider a hierarchy graded from a lower to a higher level. Not many sub-divisions are necessary as any sub-division is generally a compromise of ideas. The sub-division indicated here is that adopted in the preparation of the T.E.C. Standard Units. The hierarchy basically conforms with that of Bloom, the three highest levels, however being grouped together as Invention. This is in line with the practice of the Joint Matriculation Board in their G.C.E. assessment specifications.

(a) Information

This is taken as the lowest intellectual skill and represents the ability to recall or recognise previously learned material. A student would be expected to do such things as identify materials or events by means of their characteristics, state names or specific facts or methods or procedures or definitions. Typical verbs used to describe such learning capacities are defines, describes, identifies, labels, names, recognises, states. The term 'know' often implies objectives within this area.

(b) Comprehension

This concerns the ability to grasp the meaning of material and is a higher level than the information category though could well include some aspects of that category. A student would be expected to translate material from one form to another, graph to verbal, graph to mathematical, etc., interpret material, results of an experiment; in general, show an understanding of facts and principles. The translation is just a direct transfer from one form to another when the method of transfer is specified. This could for instance be a simple problem involving putting numbers in an equation or taking data from a graph. Discussions involving simple comparison, where no detailed evaluation is required, also can be considered as comprehension. Typical verbs used to describe learning capabilities in comprehension are calculates, compares, demonstrates, discusses, distinguishes, expresses, explains, infers, solves.

(c) Application

Here the student is expected to bring a number of ideas together, possibly to apply laws and theories to practical situations, or concepts and principles to new situations. Given an unfamiliar problem the student could select and then correctly use the appropriate equations without the equations having been specified. This would thus involve a student putting together in the right sequence the correct pieces of knowledge gained in comprehension objectives. Typical verbs indicating the learning capabilities are applies, derives, determines, predicts, relates, shows, uses. The term 'understand' is often taken to imply objectives within this area.

(d) Invention

This is the highest level in this particular four part hierarchy. Objectives at this level generally will include aspects of all the other levels. Origination, analysis, synthesis, evaluation are all implied within the title of invention. A student would be expected to recognise unstated assumptions and fallacies, evaluate the relevancy of data, formulate new processes or principles, propose plans for an experiment, judge the adequacy with which conclusions are supported by data, judge the value of a report. Typical learning capability verbs are appraises, analyses, categorizes, combines, creates, criticizes, designs, devises, discriminates, distinguishes, evaluates, generates, modifies, plans, relates, re-organizes, revises.

HIERARCHIES

Many hierarchies have been evolved for the cognitive domain. The one being used by T.E.C. is based on that of Bloom and his co-workers. The following is a comparison of the T.E.C. adopted hierarchy with that of Bloom.

T.E.C.		BLOOM
Information		Knowledge
Comprehension		Comprehension
Application		Application
Invention	(	Analysis
	(	Synthesis
	(	Evaluation

WHY OBJECTIVES ?

Many educationalists are fully committed to the use of objectives but, although there are many advocates of educational objectives, there are still those who have substantial doubts about their use.

Tyler (1964) posed the question commonly put forward 'why is it now considered important to define objectives clearly when teachers in the past have done excellent work without having a clear statement of goals?' He explains that it is certainly true that many teachers have a sense of what is important for students to learn and some of them are able to translate the notion of educational goals into relevant learning experiences for the student without ever having put down on paper what these implicit aims are. However, many others have not carried their thinking beyond the point of selecting the content to be presented. They have not considered carefully what the students are to do with the content. In such cases, students commonly believe that they are to memorize all or important parts of the content and other objectives involving behaviour distinct from memorization are not developed. This question, Tyler believes, can also be examined from the point of view of the student. When Tyler interviewed more than 100 students at the upper elementary and secondary school levels, he observed that students reported that they found out what they were to learn from three sources, these being the text books and work books, what the teacher did in class and the advice of other students. If the objectives are not clearly stated in the text books students will obviously carry out many irrelevant activities and, perhaps, then not achieve the desired goals. Eisner (1967) put forward several arguments against the use of objectives, these being briefly as follows:-

1) The outcomes of instruction are far too numerous and complex for educational objectives to encompass. The amount, type and quality

of learning that occurs in a classroom, especially when there is inter action among students, are only in a small part predictable. The changes in pace, tempo and goals that experienced teachers employ when necessary and appropriate for maintaining classroom organisation are dynamic rather than mechanistic in character. Elementary school teachers, for example, are often sensitive to the changing interests of the children they teach and frequently attempt to capitalise on these interests. In the very process of teaching and discussing, unexpected opportunities emerge for making a valuable point, for demonstrating an interesting idea and for teaching a significant concept.

2) A second limitation of theory concerning educational objectives is its failure to recognise the constraints that some subject matter places upon objectives. The point here is brief. In some subject areas, such as mathematics, languages and the sciences, it is possible to specify with great precision the particular operation or behaviour the student is to perform after instruction. In other subject areas, especially the arts, such specification is frequently not possible and, when possible, may not be desirable.

3) Educational objectives provide, it is argued, the standard against which achievement is to be measured. Both taxonomies are built upon this assumption since their primary function is to demonstrate how objectives can be used to frame test items appropriate for evaluation. The assumption that objectives can be used as standards by which to measure achievement fails to distinguish adequately between the application of a standard and the making of a judgement. Not all - perhaps not even most - outcomes of curriculum and instruction are amenable to measurement.

Davies (1976) agrees with these points and adds that creation and invention are primarily a product of spontaneous development and that they take time to appear or develop. Self-surrender, rather than control through previously defined goals, is always hard to achieve. Furthermore, he adds that when objectives are defined, all too often they appear to be hideous caricatures of the feelings that you have about what you want to happen. Creative curriculum development and good teaching do not necessarily begin with a blue print. The constantly evolving richness, the intricate subtleties, the never-ending succession of refinement - all of which lie at the very heart of the creative process can sometimes be lost in the apparent materialism of objectives.

Popham (1968), although strongly committed to the use of instructional objectives, comments on the objections to objectives and considers the following reasons given by objectors, none of which Popham believes are valid.

1) Trivial learner behaviours are the easiest to operationalize : hence the really important outcomes of education will be under-emphasized.

2) Prespecification of explicit goals prevents the teacher taking advantage of instructional opportunities unexpectedly occurring in the classroom.

3) Apart from pupil behaviour changes, there are other types of educational outcomes which are important, such as changes in parental attitudes, the professional staff and community values.

4) Measurability implies behaviour which can be objectively and mechanistically measured; hence there must be something dehumanizing about the approach.

5) It is somehow undemocratic to plan in advance precisely how the

learner should behave after instruction.

6) Popham, quoting Jackson (1966), 'That isn't really the way teaching is; teachers rarely specify their goals in terms of measurable learner behaviour; so let's set realistic expectations of teachers'.

7) In certain subject areas, e.g. fine arts and the humanities, it is more difficult to identify measurable pupil behaviour.

8) While loose general statements of objectives may appear worthwhile to an outsider, if most educational goals were stated precisely, they would be revealed as generally innocuous.

9) Measurability implies accountability; teachers might be judged on their ability to produce results in learners rather than on the many bases now used as indices of competence.

10) It is far more difficult to generate precise objectives than to talk about objectives in customarily vague terms.

11) In evaluating the worth of instructional schemes, it is often the unanticipated results which are really important but prespecified goals may make the evaluator inattentive to the unforeseen.

Bacon (1974) voiced yet another argument against the use of objectives in his article 'Objectives - A Means to an End'. His argument is that for any course in any discipline, any number of objectives may be defined but many of them would be virtually valueless. Bacon goes on the say 'Write any good objective and immediately one could define several more, aligned to each learning step leading to the main one. But such activity, by multiplying objectives, can lead only to confusion and the ultimate defeat of the original intention. Effectively it treats every teacher as an idiot since it assumes that he is incapable of exercising common sense or even that he does not know his subject. The writing is on the wall and very clear to be read. Already we are well on the way to be treated as a set of morons, to be armed with a detailed tick list every time we meet our students.'

In reply to Bacon, Reti (1975), gives the opinion that if objective tests are to become increasingly used as tools of external assessment, (as with the City and Guilds 732 Achievement Testing Course), then precisely defined objectives (as in the 732 schedule) are necessary to minimise the variations in syllabus interpretation that could otherwise occur. In reply to Bacon's opinion that objectives treat teachers as idiots, Reti says 'Bacon was writing from the vantage point of an experienced teacher, thoroughly familiar with the examination requirements of his course. But what of the new teacher, or one teaching a new course, or above all, the part-time evening teacher who hardly ever sees a full-time colleague whom he can consult for guidance? These are the people whose first questions on being confronted with the syllabus are 'to what depth should I teach the subject; into how much detail should I go?' This isn't a matter of not knowing one's subject. On the contrary, it may often be a matter of knowing it too well but, through inexperience, or not having enough information to correctly interpret the examiners' intentions. To meet this problem, published objectives are clearly necessary.'

CRITICISM OF THE TAXONOMY

Writers over the years have had a number of criticisms of Bloom's Taxonomy. Lawton (1973) makes a résumé of these criticisms as follows:-

1) One of these criticisms is quite basic to the whole idea of separating knowledge into three domains : cognitive, affective, and psycho-motor. Some critics feel that more is lost than is gained by such an analysis. It may be useful to sub-divide at an abstract level, but in practical educational settings the

connection between cognitive and affective is so close as to make the distinction in terms of objectives a highly artificial one.

2) A second criticism concerns the hierarchy or taxonomy itself. It must be recognised that there are important aspects of learning to be assessed other than those most easily examined (specific items of information easily committed to memory and regurgitated when required). However evaluation is necessary throughout the taxonomy, and it may be a little misleading to leave evaluation until number six in the taxonomy if this gives the impression that it is something which can take place only after the others have been accomplished. One of the ideas of much modern education is to introduce evaluation at all stages of learning; to emphasise critical appraisal rather than memorization from the beginning.

3) A third objective concerns the emphasis of the taxonomy on 'behavioural' objectives. The danger here is that educationalists will be dominated by the idea of what is possible to measure, and allow this to influence what they want to teach. In fact, a new slogan which seems to be emerging in certain American contexts is, 'If you can't measure it, don't try to teach it'. In this form the argument reaches its darkest stage; if teachers can only be allowed to teach things which can be evaluated later in terms of changes in pupils' behaviour, this is accepting a strait-jacket rather than a useful guide.

Socket (1971) also made reference to Bloom's Taxonomy and claims that, in the taxonomy, the precise view of learning is unclear, for the content does appear to be part of a complete statement of objectives, and that separation of behaviour and content leads to considerable difficulties. Socket believes that the context in which the Taxonomy is to be viewed, is that of an 'ideal' model of the Curriculum in which ends are rigidly distinguished from means and a distinction is made between the behavioural and substantive elements of any particular instructional objective.

Considering all the criticisms of using instructional objectives, it would be difficult to find anyone who would not concede that there is a certain amount of truth in them, but, looking at the overall picture, some concluding remarks made by Popham (1968) seem to sum up the situation when he states 'any risks we run by moving to behavioural goals are miniscule in contrast with our current state of confusion regarding instructional intention. The objections against behaviourally stated goals are not strong enough. To secure a dramatic increase in instructional effectiveness, we must abandon our customary practice of goal-stating and turn to a framework of precision.'

EVALUATION

Cronback (1969) states that course evaluation should ascertain what changes a course produces and should identify aspects of the course that need revision. Lindgren (1967) tells us that 'evaluation is the result of the teacher's concern with the goals of education. In his role as an evaluator the teacher asks himself such questions as the following "Are students making any progress in the direction of the goals appropriate to his learning situation? What evidence indicates whether or not they are progressing? How much progress, if any, are they making? To what extent can their success (or failure) be attributed to the experiences that they have had in the classroom?"' Mills (1972) claims that assessment is an integral part of the teaching learning process, and that the objectives of a training programme are achieved by good motivation, sound teaching, activity learning, continuous assessment and feed back, operating in a unified process. Stake (1969) is of the opinion that formal evaluation of education is recognized by its dependance on check lists, structured visitation by peers, controlled comparisons and standardized testing of students. He claims that some of these techniques have long histories of successful use, but unfortunately when planning an evaluation, few educators consider even these four. From Stake's experience, the more common notion is to evaluate informally : to ask the opinion of the instructor, to ponder the logic of the programme or to consider the reputation of the advocates and seldom do we find a search for relevant research reports or for behavioural data pertinent to the ultimate curricular decisions. Nickson (1971) defines evaluation as 'the generating point of a new curricular cycle' and that, without making the results of evaluation known, the series of events dies and the process stops. Feedback is therefore essential. Although it may sound straight forward enough, accomplishing this is one of the most difficult parts of implementing the curricular process. Lawton (1975) observed that from discussion of psychological contributions to curriculum planning, there emerged the point that evaluation is essential on any educational programme for at least two reasons : one is that feedback to the pupil at frequent intervals improves his performance, another is that it is highly desirable for the teacher to know, again at frequent intervals, how successful he is at achieving his teaching objectives. As Popham (1970) indicated, if a teacher is committed to improvement of his instruction, he must make some evaluation of the success of his teaching in order to know where modification should be made. Students must also be evaluated. A strange quirk of instructional methodology is that these two critical processes are generally considered separately. Our position is that evaluation of teachers should not disassociate these two tasks but rather should depend primarily on the record of achievements that teachers produce in their learners. A problem, then, is for a teacher to be able to design measurement instruments that properly reflect the objectives he is trying to achieve. Hastings (1969) talked of evaluation in the light of curriculum innovation and claims two general purposes of evaluation. These are (1) evaluation concerns the collection of information to be used as feedback to the innovators for further revision of materials and methods. Without such feedback, either the decision to revise or the decision not to revise, and most certainly the decision of how to revise, must be based upon feeling tones and the arguments of personal preference, (2) the second purpose of evaluation is to provide information as input for decision making by the schools about adoption of course content improvement packages. 'If the educational establishment is to move toward the point of basing decisions about revision and decisions about adoption on educational purpose and outcome, we need far more evaluation data of all kinds that we have had in any instance to date. We do need, however, somewhat different kinds of data for the purposes of revision and adoption'.

IMPORTANCE OF EVALUATION

A course of instruction has been designed to achieve certain objectives. The first draft of the course, the notes and learning materials, and the activities of the teacher himself are unlikely to be the best possible. How do we measure their success and improve them?

The success of the course is measured in terms of the degree of student success in attaining the objectives. If the objectives form a detailed hierarchy, then the effectiveness of the material can be gauged in some detail. During the operation of the course the success of the student in attaining each component objective can be monitored. Problems and obscurities will readily be noticed and pinpointed. These can then be overcome by modifying the course materials, or by some temporary expedient. (Baume 1974). Taking these views a step further, Litwak (1970) claims that the evaluator should measure the student's knowledge before any new programme is introduced, and then measure afterwards before deciding if the new programme or part of the new programme is more effective than previous methods.

In the training function the importance of and the need for evaluation is becoming more and more accepted, and most people involved in training accept that evaluation is important. This of course does not mean that evaluation is actually carried out. However, more and more evaluation schemes are being carried out. Three reasons for evaluation, as seen by Warr (1970), are:-

1) Evaluation provides the trainer with information that will enable him to increase the effectiveness of later or even current training. Deprived of information about the results of training sequence, there

is no logical way in which the trainer can plan the more effective utilisation of his resources. It only becomes possible to learn by experience if success can be distinguished from failure.

2) The training department, like all other departments, will be expected to play its part in the achievement of the organisation's objectives. If trainers can demonstrate factually that they are making a genuine contribution to organised goals, this can lead to an increase in both the standing and influence of the training department within the organisation.

3) An attempt to build an evaluation scheme into a training programme often entails making some alterations and additions to the original training framework. Experience has shown that modifications, irrespective of their evaluation purpose, regularly benefit training in their own right.

Active response is fairly well accepted as an essential component of efficient learning. People learn better if they are given some information and/or a practical problem, and then have to use that information to solve the problem. What is important is that the format of instruction should demand some effort from the learners. Indeed, one way to make a quick check on the quality of a lesson or a lesson plan is to ask "What does this require the trainee to do?" "How often does the instructor get a response from the trainee?" When a learner has made his active response he needs to have it evaluated as soon as possible. Feedback must enable one to decide why the previous response was unacceptable. (Gane 1972). Giving weight to Gare's argument is the observation made by Beard (1972) that it hardly required an investigation by psychologists to appreciate that some kind of feedback is needed to enable anyone engaged in learning to find out whether he is doing what is required of him. If he is not told whether he succeeds and has no means to judge for himself, there is little point in making further efforts. Until the learner has established standards by which to assess his own performance, he needs detailed and prompt criticism to redirect his learning. Mills (1972) agrees with these points and adds that it is important to give trainees the results of a test and to hold a post-mortem on the result, within a day or two of the test. Mills also claims that the longer the interval between test and result, the more remote the test becomes in the mind of the trainee and the beneficial effects of timely praise or censure rapidly diminish. The main factors which determine the form of assessment used during teaching and learning should therefore be:-

(a) the need to include all important objectives

(b) the need to provide the learner with adequate information about the nature and level of his performance, and

(c) the need to provide the teacher with information to help him fit his teaching to the needs of his students.

For the administrator, evaluation is the key to the optimum use of teaching resources. For the student, evaluation is the key to self-evaluation. For the teacher, evaluation is the key to professionalism, whereby he applies the same intellectual standards to his teaching as he applies to his research. (MacKenzie 1970).

THE USE OF TESTS

If a teacher wishes to have an adequate basis for judging the quality of his instruction, he should use tests that accurately and representatively reflect his objectives. How can he be assured of this accuracy? Popham (1970) points out that unless the teacher has access to prepared items he must get into the business of writing tests himself. Tests produced by the teacher have the advantage of being specific to the instructional target -

that is to say essentially equivalent to that teacher's instructional goals. The performance of students, therefore, can be used to make valid judgements regarding the performance of the teacher, generally in terms of the previously established class minimal level of student performance. Tests which measure a student's attainment of stated objectives are referred to as 'criterion referenced tests'. Tests of this kind are usually given at the end of a particular presentation or instructional sequence. Tests of this kind can also be used to establish changes in student behaviour on a pre-test and post-test basis. Agreeing with this, Stenhouse(1975) argues that in measurement-based evaluation the function of objectives is to make if possible to develop criterion-referenced, rather than norm referenced tests. Norm referenced tests tell us how an individual performs as compared with a group. Criterion-referenced tests tell us how an individual performs in relation to a set standard. The teacher or curriculum developer is invited to nominate, by stating his objectives, the standard by which he wishes his work to be assessed, provided that the standard is couched in behavioural terms which make it possible to develop criterion-referenced tests. He can opt for the way in which the curriculum is to be measured, but not for the method by which it is to be judged. He cannot, for example, ask that it be judged on its internal logic or by the judgement of teachers or of students. It is to be judged, according to Stenhouse in the light of the measurement of the performance of students on criterion-referenced tests. Glaser (1969) comments 'achievement measurement can be defined as the assessment of terminal or criterion behaviour : this involves the determination of the characteristics of student performance with respect to specified standards.'

Popham (1970) explains that in the case where one can specify the whole of the content implied in the objective, the best way of choosing specific items for inclusion in a test is to use random procedures. By flipping a coin, placing items into a hat and selecting, or using a table of random numbers and choosing items whose numbers occur first, one can constitute a representative test. Such a test is eminently fair, since every item has the same chance of being used in the test. It is unlikely that the test is systematically biased towards being too difficult or too easy. Performance in it would indicate fairly the success the teacher has had with the objective.

CHAPTER 3

DESIGN AND METHOD OF RESEARCH

The research work contained in this thesis consists of the following:-

1) QUESTIONNAIRE ON STUDENTS' ATTITUDES AND OPINIONS

The purpose of this questionnaire is to find out the attitudes and opinions of students with regard to:-

(a) the content of motor vehicle courses,

(b) the way in which courses are presented to them,

(c) the teaching staff with whom they have contact,

(d) their employment and environment.

DETAILS CONTAINED IN STUDENTS' QUESTIONNAIRE

QUESTIONS 1 TO 51

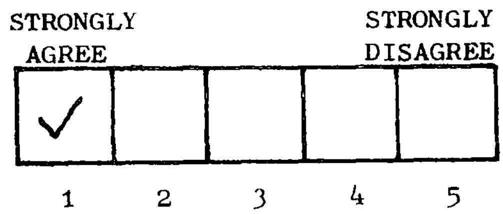
These questions are mainly concerned with the student's background, and include items such as opinions and attitudes of past school life, school academic record, home background, pastimes and interests, details of any previous employment, and advice received from parents and school on matters concerning career prospects.

QUESTIONS 52 TO 140

This section of the questionnaire contains questions asking students for their opinions and attitudes on matters such as the course they are attending at college, individual topics within a course, the presentation of course topics and the college staff with whom they have contact while attending their course.

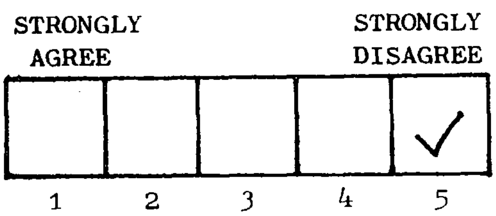
The opinions asked for in this section of the questionnaire are based on a five point scale.

If the student strongly agreed with a statement he would place his tick as follows:-

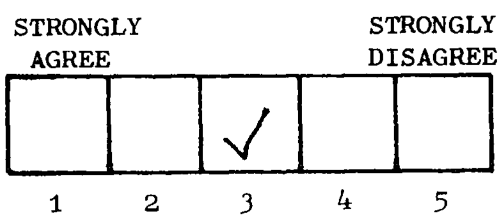


The lower the number, the more agreement.

If the student strongly disagreed with the statement he would place his tick as indicated.



If the student was undecided as to whether he agreed with the statement, he would place his tick in the neutral number 3 position.



Therefore each box represents opinions as follows:-

BOX 1 indicates 'strongly agree'

BOX 2 indicates 'agree'

BOX 3 indicates 'neutral, neither agree nor disagree'

BOX 4 indicates 'disagree'

BOX 5 indicates 'strongly disagree'.

QUESTIONS 141 TO 149

This section concerns questions on the importance to the student of examination success, in his college course and questions are also asked on how he actually obtained his employment, the type of course preferred and his opinions of courses already attended.

QUESTIONS 150 TO 154

These questions are concerned with homework activities and opinions are sought from the student on the most effective way of dealing with homework set in various course subjects. The response required was a tick in the appropriate box/boxes numbered from one to seven, the choices offered being (1) Homework not needed. (2) Copying up notes. (3) Practicing of routine skills/procedures. (4) Tackling new problems. (5) Working through self study packages. (6) Collecting information from work. (7) Reading text books.

QUESTIONS 155 TO 159

This part of the questionnaire deals with opinions on the way students record information. The method/methods for a particular subject had to be chosen from (1) Dictation from the lecturer. (2) Notes from blackboard. (3) Class handouts. (4) Use of test books. (5) Own made notes.

QUESTIONS 160 TO 164

In this final part of the students' questionnaire, the information required deals with teaching methods and learning activities best suited to subjects. The choice of teaching method/learning activities being (1) Exposition. (2) Question and answer sessions. (3) Group discussions and assignments. (4) Individual tutorials. (5) Self study. (6) Practice.

For the purpose of comparison it was thought prudent to split the students filling in this questionnaire into four groups, so that as well as obtaining overall results, separate results could be studied from motor vehicle craft students under the age of 18 years, as well as motor vehicle craft students over 18 years of age. Results from motor vehicle technician students falling into the same age categories were also sought.

The numbers of students taking part in this questionnaire survey were as follows:-

(a) Motor Vehicle Craft Students under 18 years of age 111 Students

(b) Motor Vehicle Craft Students over 18 years of age 115 Students

(c) Motor Vehicle Technician Students under 18 years of age 108 Students

(d) Motor Vehicle Technician Students over 18 years of age 111 Students

2) <u>QUESTIONNAIRE ON COURSE EFFECTIVENESS</u>

The purpose of this questionnaire is to find out, prior to some course redevelopment, what opinions lecturers have on the way courses should be presented and how lecturers interpret students' attitudes and opinions.

The questionnaire has been designed to be given to college lecturers who have specific knowledge of motor vehicle students. Statements and questions are given to the lecturers which in the main correspond directly with those questions and statements given to the students. Therefore direct comparisons can be made between the students' and the lecturers' responses. The design of the questions allows the lecturer to respond in exactly the same way as the student, that is by placing a tick in the appropriate opinion square of his choice.

In asking lecturers to make responses like this, it was thought desirable to ask them to make two responses to each question/statement, one response relating to a craft student and the other relating to a technician student as follows:-

'Students think they enjoy their jobs more than the average worker.'

	STRONGLY AGREE				STRONGLY DISAGREE
CRAFT STUDENT	✓				
	1	2	3	4	5
TECHNICIAN STUDENT					✓
	1	2	3	4	5

In this example the lecturer's response shows that he strongly agrees that craft student enjoy their jobs more than the average worker and, at the same time, strongly disagrees that technician students enjoy their jobs more than the average worker.

3) CLASSIFICATION OF INTELLECTUAL LEVELS

A section included in the lecturers' questionnaire that does not appear in the students' questionnaire is a section dealing with the classification of intellectual levels. For this purpose it was decided to use the four intellectual levels adopted by the Technician Education Council; those of (a) INFORMATION (b) COMPREHENSION (c) APPLICATION (d) INVENTION. The following definitions of these intellectual levels are given on the first page of the questionnaire:

(a) INFORMATION

This lowest level involves the remembering of previously learned material. This may involve the recall of a wide range of material from specific facts to methods, theories and definitions.

(b) COMPREHENSION

Comprehension is defined as the ability to grasp the meaning of material. This could involve:-

(i) translating material from one form to another (words to numbers);

(ii) interpreting material (interpolation of a graph or explaining in own words);

(iii) estimating future trends (oxtrapolation of a graph or predicting consequences);

(c) APPLICATION

Application refers to the ability to use learned material in new situations.

(d) INVENTION

Objectives at this the highest level, expect the student to produce a finished article (i.e. a design, or a judgement) after having duly considered all the relevant aspects.

The first half of the questionnaire consists of fifteen objectives based upon the topic of a gearbox. There are four sub topics within the main area of work, these being (a) Layout (2) Calculation of ratios (3) Reverse gear, and (4) Load conditions.

The topic of the gearbox is a first year craft subject. Consequently one would expect the lower intellectual levels to be predominant but, for experimental reasons, the basic theme of each sub-objective was written out at more than one intellectual level with the operational verb in each case remaining the same. All objectives were then randomly placed in the questionnaire.

The first fifteen questions were then answered by reaching each objective and placing a tick in a square at the appropriate intellectual level.

<u>A PANEL OF EXPERTS AT THE HUDDERSFIELD FURTHER EDUCATION EXTRA MURAL CENTRE AT WALDRIDGE, CO. DURHAM GAVE THE FOLLOWING DESCRIPTION OF THE OBJECTIVES</u>

<u>TOPICS</u>	<u>INTELLECTUAL LEVEL</u>	<u>CONDITIONS</u>
(a) <u>LAYOUTS</u>		
Q. No's 1	COMPREHENSION	VERBAL ✓ STATE WHY
10	INFORMATION	SKETCH ✓ STATE
12	INFORMATION	VERBAL ✓ STATE
(b) <u>CALCULATION OF RATIOS</u>		
Q. No's 2	COMPREHENSION	V/NUMERICAL ✓ CALC.
3	APPLICATION	V/OBJECT ✓ CALCULATE
4	INVENTION	V/OBJECT ✓ CALCULATE

TOPIC	INTELLECTUAL LEVEL	CONDITIONS	
(b) CALCULATION OF RATIOS (continued)			
Q. No's 11	INFORMATION	-	CALCULATE
(c) REVERSE GEAR			
Q. No's 5	INFORMATION	V/OBJECT ✓	STATE HOW
6	COMPREHENSION	VERBAL -	STATE
9	APPLICATION	VERBAL -	STATE
13	INFORMATION	VERBAL -	STATE
15	COMPREHENSION	V/SKETCH ✓	STATE
(d) LOAD CONDITIONS			
Q. No's 7	INFORMATION	VERBAL -	EXPLAIN
8	COMPREHENSION	VERBAL -	EXPLAIN
14	APPLICATION	VERBAL ✓	EXPLAIN

The second half of this questionnaire consists of a further fifteen questions. The same objectives were given and the person filling in the questionnaire was then asked to choose, up to a maximum of three, the most appropriate teaching methods or learning activities that would best achieve the expected learning outcomes. The choice of teaching and learning activities were:

1) EXPOSITION:- lecturer lecturing, perhaps with the use of aids and demonstrations.
2) QUESTION AND ANSWER SESSIONS:- class responding to lecturer's questions.
3) GROUP DISCUSSIONS:- students working or discussing in groups.
4) INDIVIDUAL TUTORIALS:- lecturer tutoring individual students.
5) SELF STUDY:- students learning and working alone.
6) PRACTICE:- students involved in repetitive practice of activities to improve competence.
7) LABORATORY AND WORKSHOP ACTIVITES:- student learning using equipment,

tools or materials.

INFORMATION REQUIRED

The following information was required from this questionnaire:

1) The spread of scores.

2) A comparison between experts' opinions and those of lecturers as to the intellectual level of objectives.

3) Any 'significant' scores. The percentage of significance was based on an arbitrary figure of 70% decided by the panel of experts. This percentage was obtained by taking the majority choice of intellectual level and comparing with the total of the scores of the other three levels.

4) The level and type of objective most easily understood.

5) The most appropriate teaching methods and/or learning activities for each objective.

4) STUDENT EVALUATION TESTS

These tests were divided into three categories, these being

CATEGORY 1

MOTOR VEHICLE CRAFT STUDENTS (TESTED DURING THEIR COURSE)

SUBJECT:- FOUR SPEED CONSTANT MESH GEARBOX

The purpose of this piece of research was to see if students who had been taught a topic by means of instructional objectives achieved significantly higher scores when tested than students who had been taught in the traditional way.

Two groups were tested in this category 1 test consisting of 75 first year motor vehicle craft students. The test was conducted when the students had reached the appropriate stage of the syllabus. Forty-one students were chosen at random and formed group one of this category. These students were given a copy of the instructional objectives they were required to know by the end of a forty five minute session. Thirty minutes were used by the lecturer in working through the objectives, and fifteen minutes were used to answer questions, clarifying any points of possible misunderstanding. During the same class period the remaining 34 students, forming group two, were taught the same topic in the traditional way, and without the use of instructional objectives. Unlike the method used with group one students, there was no specific time laid down to complete the lesson topic. Both groups of students were told that a short test covering the area of the four-speed constant gearbox would be given to them the following week. This test consisted of fifteen questions with a timed completion allowance of fifteen minutes and the questions asked were based upon previously set regional and nationally set examination questions at the craft one level.

CATEGORY 2

MOTOR VEHICLE CRAFT STUDENTS (TESTED TOWARDS THE END OF THEIR COURSE)

SUBJECT:- FOUR SPEED CONSTANT MESH GEARBOX

Two groups consisting of forty-one first year motor vehicle craft students took part in this category 2 test. The tests in this case were conducted towards the end of the teaching year when all students undertaking the test had already been taught the topic in question by traditional methods. The first twenty-one students were chosen at random to form group one of this category and these students were then given a copy of the instructional objectives. Forty five minutes were then spent by the lecturers concerned with both groups, treating the session as an instructional/revision one. A test was then given immediately following this session to both groups consisting of the same fifteen questions as given to category 1 students.

CATEGORY 3

MOTOR VEHICLE C.S.E. COLLEGE LINK STUDENTS

The tests were arranged in a different way for these students, a search being made for a suitable way of making the testing as valid as possible.

It is normal practice for motor vehicle C.S.E. students attending college on one half day per week over a period of two years to be assessed on a continual basis. Tests are given to these students at intervals of six weeks, the topics contained in the tests having been taught to them during the preceding six weeks. For the purpose of this experiment four groups of students were used, each group attending a different comprehensive school in the Durham area. The reason for the choice of link students for these experimental tests was that it was thought unlikely that these students would have prior specific knowledge of the topic areas contained within their tests, and the examination performance would be due entirely to the taught lesson and not to some other outside influence as might be the case of motor vehicle trade students who could possibly enforce their knowledge gained at the college by practical work. Even this possibility is fairly remote because first year motor vehicle trade students would not generally be allowed to work on gearboxes. For the purpose of the tests, the students were randomly formed into two groups 'A' and 'B' by drawn numbers.

TEST 1 SUBJECT AREA:- CLUTCH AND TRANSMISSION

Specific instructional objectives were written covering the first six weeks work and, as before, these were given to the students and also used by the lecturers concerned in presenting the lessons. In this first test Group 'A' received the specific objectives and group 'B' was taught at the same time by traditional methods. At the end of the six weeks period the same test was given to both groups.

TEST 2 SUBJECT AREA:- TRANSMISSION AND ENGINE COOLING

For the second period of six weeks, group 'B' was given the prepared objectives for the subject areas indicated, and this time group 'A', which had for the previous six weeks been given the instructional objectives, was taught by traditional means, that is without specific instructional objectives.

The purpose of this arrangement was to see if, in each case, the students receiving and being taught by instructional objectives were on average achieving significantly higher marks than those being taught in the more traditional manner. The number of students taking part in these category 3 tests were:-

TEST 1:- 46 students received objectives and
39 students were taught traditionally

TEST 2:- 38 students received objectives and
48 students were taught traditionally

LOCATION OF INFORMATION IN APPENDICES

1)	Questionnaire on Students' Opinions and Attitudes	APPENDIX 1
2)	Questionnaire on Course Effectiveness (Lecturers' questionnaire)	APPENDIX 2
3)	Classification of Intellectual Levels	APPENDIX 3
4)	Students' evaluation test - Categories 1 and 2	APPENDIX 4
5)	Students' evaluation test - Category 3 test 1	APPENDIX 5
6)	Students' evaluation test - Category 3 test 2	APPENDIX 5

MEASUREMENT AND EVALUATION TECHNIQUES

The measurement and evaluation techniques used for questionnaires involved with opinions and attitudes of lecturers and students are (a) the means, (b) standard deviation, (c) correlation of responses.

In the case of the classification questionnaire, comparison with expert opinion was made. For the criterion referenced evaluation tests, the measurement instrument used to judge the statistical significance of the mean difference is the 't' test.

CHAPTER 4

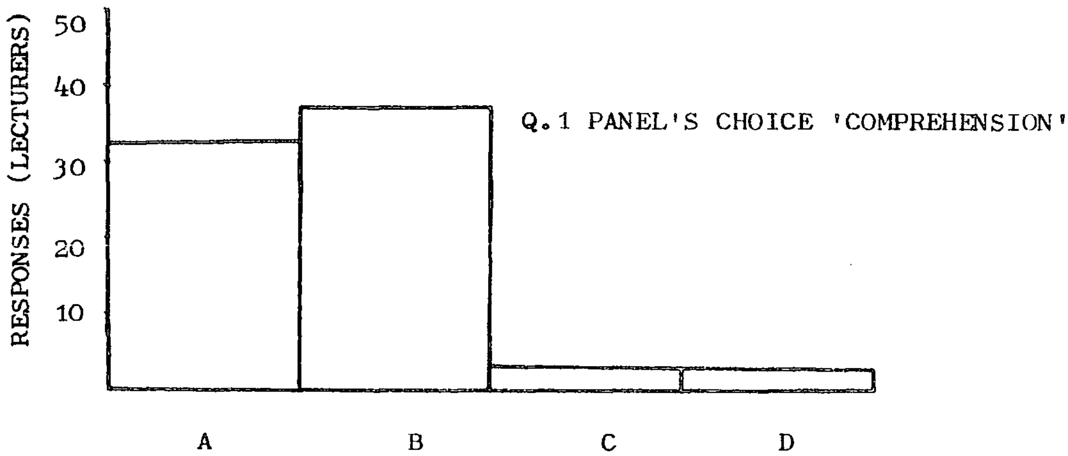
REPORT ON CLASSIFICATION QUESTIONNAIRE

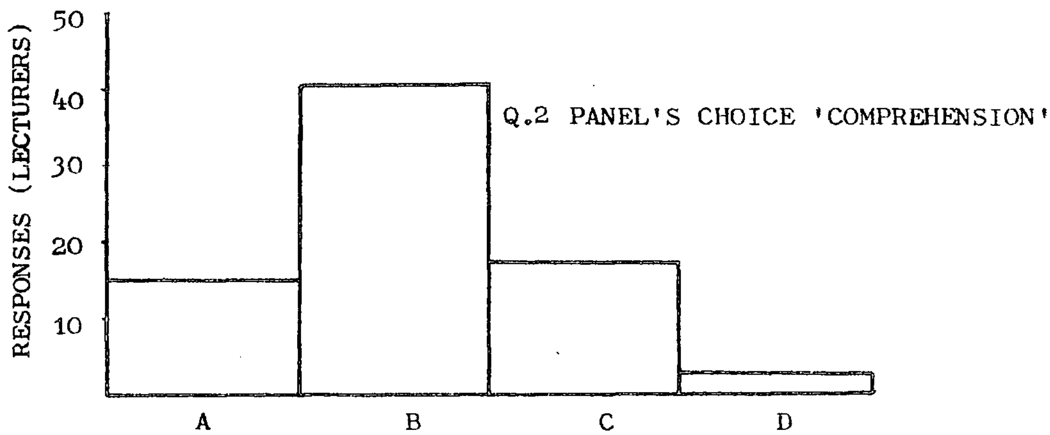
Motor vehicle lecturers filling in this section of the questionnaire numbered 74.

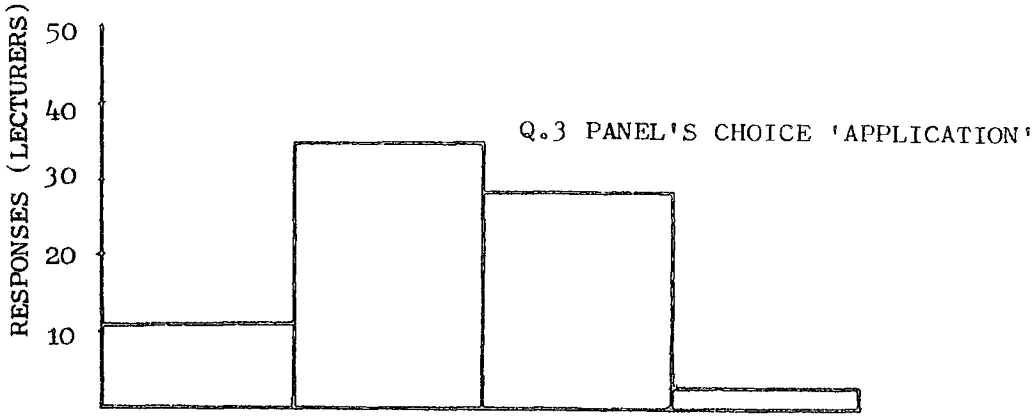
QUESTIONS 1-15

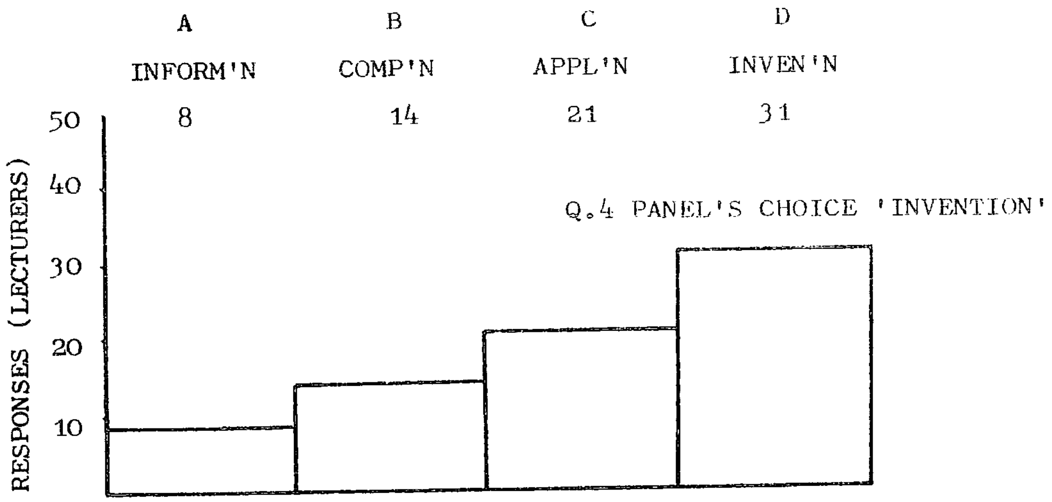
TABLES 4.1. - 4.15.

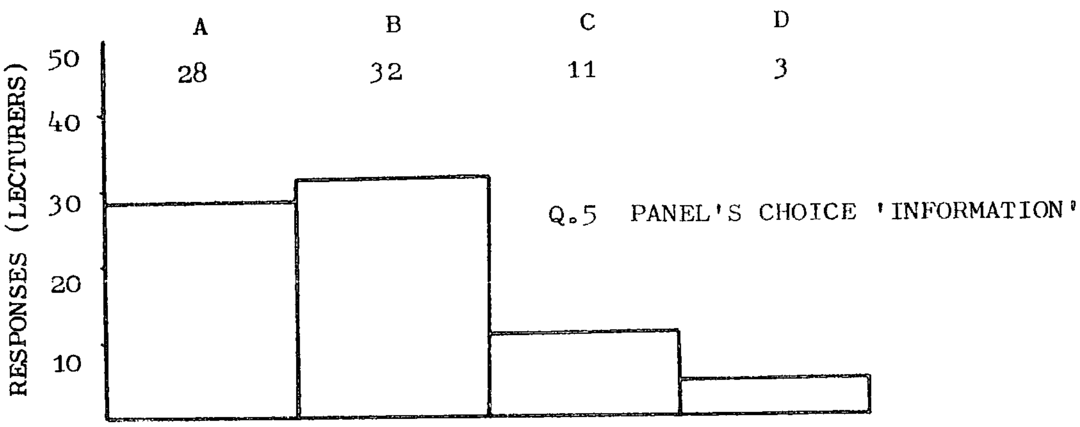
A	B	C	D
INFORM'N	COMP'N	APPL'N	INVEN'N

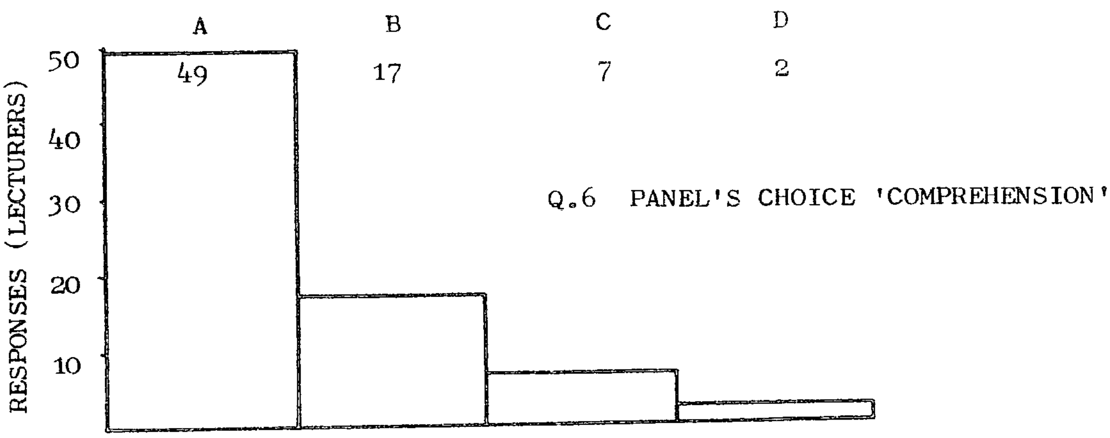


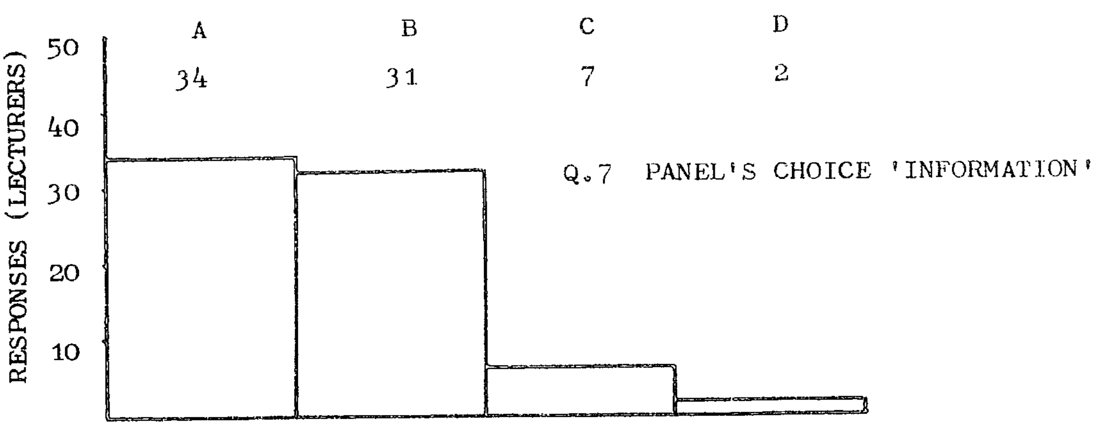


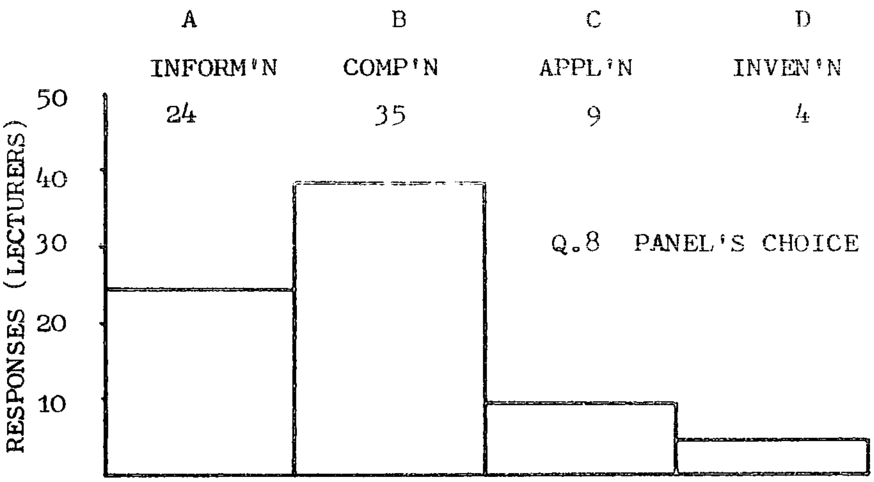



A
B
C
D
INFORM'N
COMP'N
APPL'N
INVEN'N
8
14
21
31
50
40
30
20
10
RESPONSES (LECTURERS)
Q.4 PANEL'S CHOICE 'INVENTION'

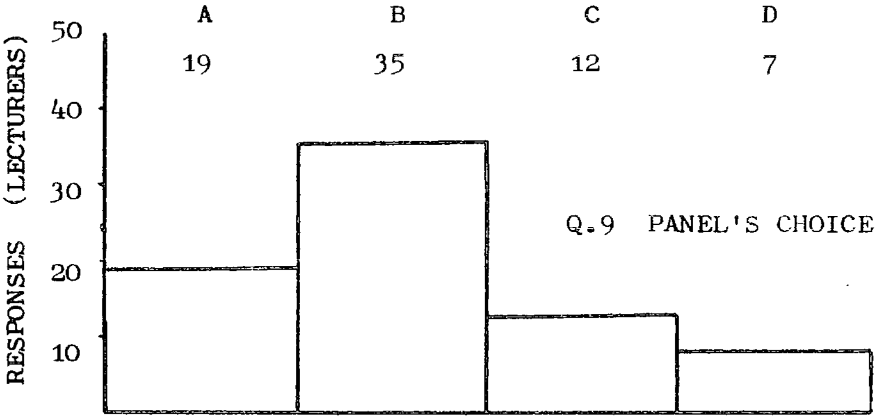

A
B
C
D
28
32
11
3
50
40
30
20
10
RESPONSES (LECTURERS)
Q.5 PANEL'S CHOICE 'INFORMATION'


A
B
C
D
49
17
7
2
50
40
30
20
10
RESPONSES (LECTURERS)
Q.6 PANEL'S CHOICE 'COMPREHENSION'

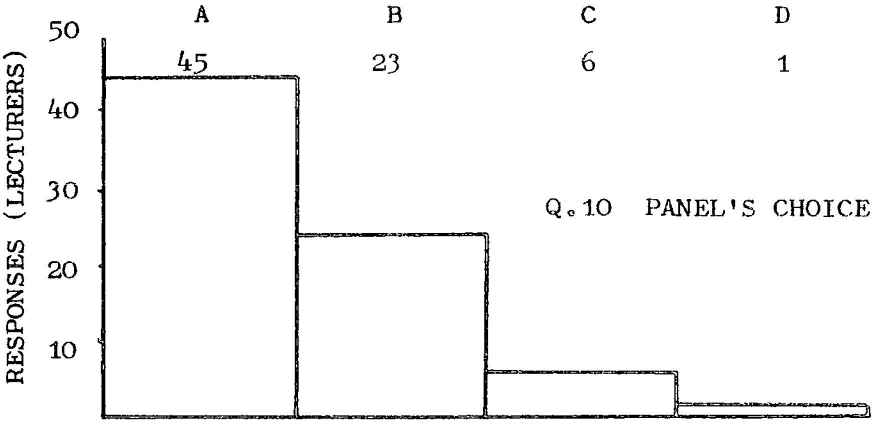

A
B
C
D
34
31
7
2
50
40
30
20
10
RESPONSES (LECTURERS)
Q.7 PANEL'S CHOICE 'INFORMATION'



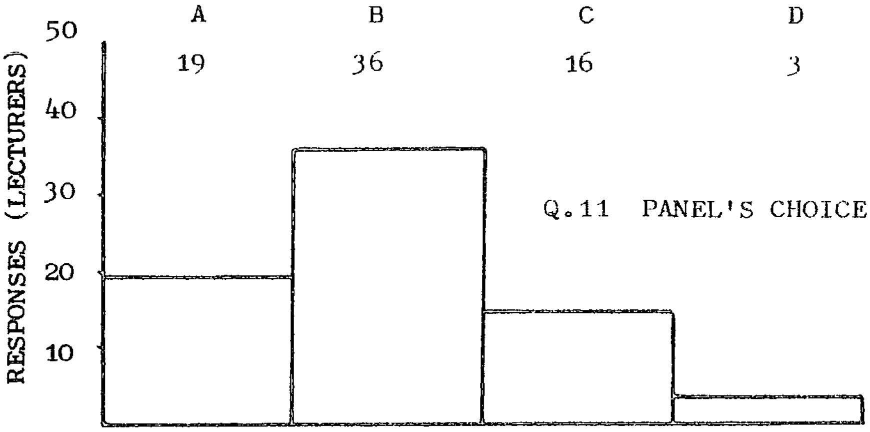
Q.8 PANEL'S CHOICE 'COMPREHENSION'



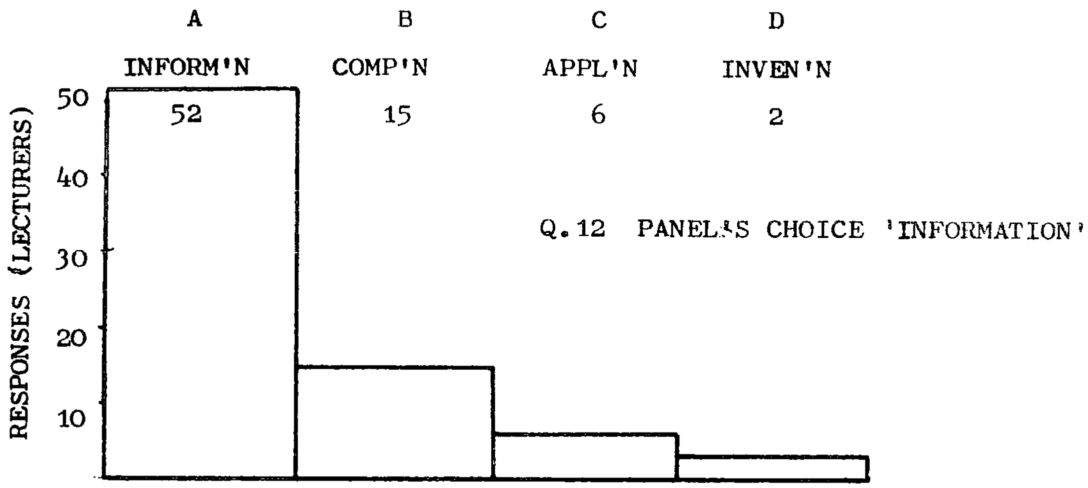
Q.9 PANEL'S CHOICE 'APPLICATION'

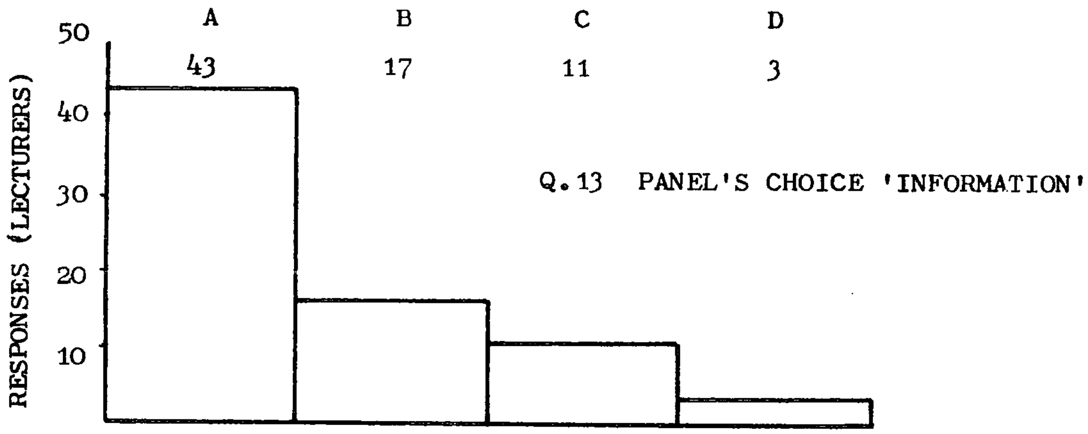


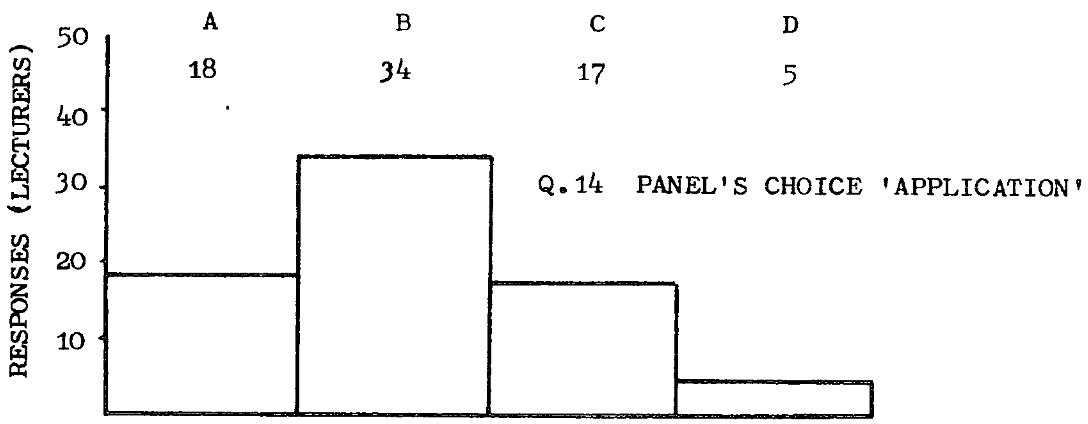
Q.10 PANEL'S CHOICE 'INFORMATION'

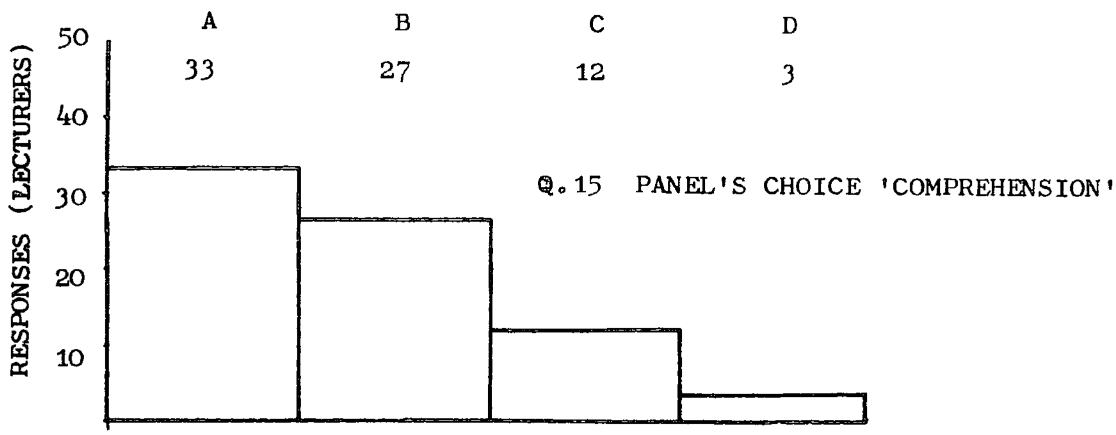


Q.11 PANEL'S CHOICE 'INFORMATION'


A
B
C
D
INFORM'N
COMP'N
APPL'N
INVEN'N
52
15
6
2
50
40
30
20
10
RESPONSES (LECTURERS)
Q.12 PANEL'S CHOICE 'INFORMATION'


A
B
C
D
43
17
11
3
50
40
30
20
10
RESPONSES (LECTURERS)
Q.13 PANEL'S CHOICE 'INFORMATION'


A
B
C
D
18
34
17
5
50
40
30
20
10
RESPONSES (LECTURERS)
Q.14 PANEL'S CHOICE 'APPLICATION'


A
B
C
D
33
27
12
3
50
40
30
20
10
RESPONSES (LECTURERS)
Q.15 PANEL'S CHOICE 'COMPREHENSION'

REPORT ON CLASSIFICATION SECTION OF TEACHERS' QUESTIONNAIRE

TABLE 4.16

Q/OBJ NO.	MAJORITY CHOICE	OTHERS	INTELLEC. LEVEL	% MAJ. CHOICE	PANEL'S CHOICE	INTELLEC. AGREEMENT
1	37	37	COMP	50	COMP	✓
2	39	35	COMP	53	COMP	✓
3	34	40	COMP	46	APP	-
4	31	43	INV	42	INV	✓
5	32	44	COMP	43	INF	-
6	49	25	INF	66	COMP	-
7	34	40	INF	46	INF	✓
8	38	36	COMP	51	COMP	✓
9	35	39	COMP	47	APP	-
10	45	29	INF	61	INF	✓
11	36	38	COMP	49	INF	-
12	52	22	INF	70	INF	✓
13	43	31	INF	58	INF	✓
14	34	40	COMP	46	APP	-
15	33	41	INF	45	COMP	-

From these figures it can be seen that, in eight questions there is agreement with the choice of the panel of experts and in seven, there is disagreement.

INTELLECTUAL LEVELS (DECIDED BY PANEL OF EXPERTS)

LEVEL	OBJECTIVE NUMBERS
INFORMATION	5; 7; 10; 11; 12; 13;
COMPREHENSION	1; 2; 6; 8; 15;
APPLICATION	3; 9; 14;
INVENTION	4;
OBJECTIVE NUMBERS WITH CONDITIONS	1; 2; 3; 4; 5; 10; 12; 14; 15;
OBJECTIVE NUMBERS WITH NO CONDITIONS	6; 7; 8; 9; 11; 13.

BASED ON 50% OR MORE AGREEMENT AND ALSO IN AGREEMENT WITH OBJECTIVE PANEL

WITH CONDITIONS 4 out of 9 = 44%

NO CONDITIONS 2 out of 6 = 33%

BASED ON 50% OR MORE AGREEMENT AND NOT TAKING INTO ACCOUNT THE OBJECTIVE PANEL'S CHOICES

WITH CONDITIONS 4 out of 9 = 44%

NO CONDITIONS 3 out of 6 = 50%

OBJECTIVE NUMBERS ACHIEVING OVER 50% AGREEMENT

1 - COMP 2 - COMP 6 - COMP 8 - COMP 10 - INF

12 - INF 13 - INF

% MAJORITY RESPONSE	TOTAL NO. OF QUESTIONS FALLING WITHIN THIS RANGE
40-44	2
45-49	6
50-54	3
55-59	1
60-64	1
65-70	2
	15

ACCEPTABLE LEVEL OF AGREEMENT

Before it can be said that any of the fifteen objectives are clearly understood by lecturers, a sufficiently large percentage agreement is needed on the interpretation of these objectives into their highest intellectual level of learning.

If a figure of 50% or over was taken as being acceptable it can be seen that out of the fifteen objectives, seven achieved this level.

Taking the view of the panel of experts a figure of 70% or over would be required to indicate a sufficient level of agreement between lecturers. Only the response to objective number 12 achieved this with a majority of 70%.

INTELLECTUAL AGREEMENT

From the chart it is interesting to note that, of the seven objectives that achieved over 50% agreement on their intellectual level, six of the seven were in agreement with the choice of the panel of experts, the exception being objective number six, the second highest percentage scored.

THE PERCENTAGE OF OBJECTIVES SHOWING 50% OR GREATER AGREEMENT ARE AS FOLLOWS:-

TABLE 4.17.

LEVELS	INF	COMP	APP	INV
No. of Objectives at this level	6	5	3	1
50% + Agreement	3	4	0	1
Percentage	50	80	0	100

Excluding number 4, which is the only objective dealing with invention, the objectives where most agreement lies are concerned with the lower intellectual levels.

Overall there seems to be a low level of agreement as to the intellectual level of learning for a given objective. The application of conditions within an objective surprisingly had no effect upon results; in fact the simpler written lower level objectives containing no conditions had the larger percentage agreement amongst the lecturers.

It would seem advisable, when an objective has been agreed upon, that the intellectual level intended be also stated. This would be less confusing for the lecturer and he or she would have a clear indication of what it is the student is actually required to know.

REPORT ON TEACHING/LEARNING ACTIVITIES FOR THE GIVEN OBJECTIVES

Here the same fifteen specific objectives were considered, and lecturers were asked to choose, for each objective, appropriate teaching activities/learning activities that would best achieve the expected learning outcomes of that objective.

The teachers were asked to choose from:-

(1) EXPOSITION:- teacher lecturing, perhaps with the use of aids and demonstrations.

(2) QUESTIONS AND ANSWER SESSIONS:- class responding to teacher's questions.

(3) GROUP DISCUSSIONS:- students working or discussing in groups.

(4) INDIVIDUAL TUTORIALS:- lecturer tutoring individual students.

(5) SELF STUDY:- student learning and working on his own.

(6) PRACTICE:- student involved in repetitive practice of activities to improve competence.

(7) LABORATORY AND WORKSHOP ACTIVITIES:- student learning, using equipment, tools or material.

RESULTS

Although there are some responses to every method/activity for all the objectives, it was thought prudent to eliminate the lower responses and chart the highest three for each objective.

TABLE SHOWING THREE HIGHEST RESPONSES FOR EACH GIVEN OBJECTIVE

TABLE 4.18.

OBJ. NO.	EXPOSITION	QUESTION & ANSWER	GROUP DIS'NS & ASSIGNMENTS	SELF STUDY	PRACTICE	LAB & W/S ACTIV.
1	61	41			18	18
2	54	26			39	
3	48				39	35
4	40				23	41
5	46	25				28
6	50	33				15
7	56	35	14			
8	59	39	16			
9	55	34				21
10	52	35				21
11	49	34			36	
12	54	29				22
13	54	29				27
14	59	37				15
15	59	38				17

TABLE 4.19.

TEACHING METHOD/ LEARNING ACTIVITY	PLACEMENTS		
	FIRST	SECOND	THIRD
(1) EXPOSITION	14	1	0
(2) LAB & W/S ACT.	1	1	5
(3) QUES. & ANS.	0	10	3
(4) PRACTICE	0	3	6

From the results obtained it is clear that exposition is by far the most popular teaching/learning method followed by questions and answers. Practice and laboratory and workshop activities are also considered to be effective to a lesser degree, but seemingly lecturers do not consider group discussions and assignments or self study to be sufficiently effective or practicable.

CHAPTER 5

REPORT ON EVALUATION TESTS

These tests were divided into three categories, the results being as follows:-

CATEGORY ONE TESTS

The number of motor vehicle first year craft students taking part in this category one test was 75. Students who received specific objectives numbered 41. The total score achieved by these students was 550 out of a possible 615, a mean score of 13.415 being obtained.

There were 34 students taking part in the test without the use of specific objectives. The total score achieved by these students was 342 out of a possible 510, a mean score of 10.059 being obtained.

A 't' test was carried out to judge the statistical significance of the mean difference. 't' was found to be 6.4813

with (41 - 1) + (34 - 1) = 73 degrees of freedom. From the distribution of 't' table, 't' = 3.460 (less than) at the 0.001 level of significance (i.e. P = 0.1 per cent) with 73 degrees of freedom.

It is therefore concluded that the instructional objectives had an effect on the D.V., as the observed value of 't' is numerically greater than 3.460, thus disproving the null hypothesis that 'there is no true difference between the test scores of students taught by instructional objectives and those taught by traditional methods.'

CATEGORY ONE TEST

TABLE 5.1. STUDENTS WITHOUT OBJECTIVES

TEST ITEMS MARKED CORRECT/INCORRECT

TEST ITEM

STUDENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SCORE
1	X	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	12
2	X	✓	X	✓	✓	✓	✓	✓	X	X	X	✓	✓	X	✓	9
3	✓	X	X	X	✓	✓	✓	✓	X	X	X	✓	✓	X	X	7
4	X	X	X	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	10
5	✓	✓	✓	X	✓	✓	X	✓	X	X	X	✓	X	X	X	7
6	X	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	12
7	✓	✓	✓	✓	✓	✓	X	X	X	X	X	✓	✓	X	X	8
8	✓	✓	X	X	✓	✓	✓	✓	✓	X	X	✓	✓	X	✓	10
9	X	✓	✓	✓	✓	✓	✓	X	✓	X	X	✓	✓	✓	✓	11
10	✓	✓	X	✓	X	✓	✓	✓	✓	X	X	✓	✓	✓	✓	11
11	X	✓	✓	X	✓	✓	X	X	X	X	X	X	✓	✓	✓	7
12	✓	X	X	X	✓	✓	✓	✓	X	X	X	✓	X	✓	✓	8
13	✓	✓	X	X	✓	✓	✓	✓	✓	X	✓	✓	✓	X	X	10
14	✓	X	✓	X	✓	X	✓	X	X	X	✓	✓	✓	X	✓	8
15	X	✓	X	X	✓	✓	✓	✓	X	X	X	✓	✓	X	X	7
16	X	✓	X	X	✓	✓	X	✓	X	✓	X	✓	✓	✓	✓	9
17	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	12
18	✓	✓	X	X	✓	✓	✓	✓	X	✓	✓	X	✓	X	X	9
19	X	✓	X	✓	✓	✓	✓	✓	X	X	✓	✓	X	X	X	8
20	✓	X	✓	✓	✓	✓	✓	X	X	X	X	X	✓	X	X	7

TABLE 5.1. STUDENTS WITHOUT OBJECTIVES (CONTINUED)

TEST ITEMS MARKED CORRECT/INCORRECT

TEST ITEM

STUDENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SCORE
21	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	13
22	✓	X	X	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	10
23	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
24	✓	X	X	X	✓	✓	X	✓	X	X	X	✓	✓	X	X	6
25	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	13
26	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	12
27	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	12
28	✓	X	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	11
29	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	13
30	✓	X	X	✓	✓	✓	✓	✓	X	✓	X	✓	✓	X	X	9
31	✓	✓	✓	X	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	12
32	✓	✓	✓	X	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	12
33	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	13
34	✓	✓	X	✓	✓	✓	✓	✓	✓	X	X	X	✓	✓	✓	11
INCORRECT	9	9	23	18	1	1	5	6	22	16	23	7	3	14	11	
% INCORRECT	26	26	68	53	3	3	15	18	65	47	68	21	9	41	32	

CATEGORY ONE TEST

TABLE 5.2. STUDENTS WITH OBJECTIVES

TEST ITEMS MARKED CORRECT/INCORRECT

TEST ITEM

STUDENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SCORE
1	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
2	✓	✓	X	✓	✓	✓	✓	X	X	✓	X	✓	X	X	X	8
3	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	X	X	11
4	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	14
5	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	14
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
7	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
9	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
10	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
11	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	13
12	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	14
13	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
14	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
15	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
16	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
21	✓	✓	X	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	12

TABLE 5.2. STUDENTS WITH OBJECTIVES (CONTINUED)

TEST ITEMS MARKED CORRECT/INCORRECT

TEST ITEM

STUDENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SCORE
22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
25	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	13
26	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
27	✓	✓	X	✓	X	✓	✓	X	✓	✓	✓	✓	X	X	X	9
28	✓	✓	✓	✓	X	X	✓	✓	X	✓	✓	✓	X	X	X	9
29	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
30	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	12
31	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
32	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
33	X	X	X	✓	✓	✓	✓	X	X	X	X	X	X	X	X	.4
34	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
35	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	13
36	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	14
37	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
38	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	14
39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
40	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
41	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
INCORRECT	3	2	18	0	2	2	0	7	9	1	2	1	5	7	6	
% INCORRECT	7	5	44	0	5	5	0	17	22	2	5	2	12	17	15	

CATEGORY TWO TESTS

The number of motor vehicle first year craft students taking part in this category two test was 41. Students who received specific instructional objectives numbered 21. The total score achieved by these students was 276 out of a possible 315, giving a mean score of 13.1428. There were 20 students taking part in the test without the use of specific objectives. The total score achieved by these students was 205 out a possible 300, a mean score of 10.25 being obtained.

A 't' test was carried out to judge the statistical significance of the mean difference.

't' was found to be 3.541157 with (21 - 1) + (20 - 1) = 39 degrees of freedom. From the distribution of 't' table, 't' = 3.307 at the 0.002 level of significance (i.e. P = 0.2 per cent) with 39 degrees of freedom.

The conclusion is, therefore, that the instructional objectives had an effect on the D.V. as the observed value of 't' is numerically greater than 3.307, thus disproving the null hypothesis that 'there is no true difference between the test scores of students who are revised using instructional objectives and those revised in the traditional way.'

CATEGORY TWO TEST

TABLE 5.3. STUDENTS WITHOUT OBJECTIVES

TEST ITEMS MARKED CORRECT/INCORRECT

STUDENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SCORE
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	14
2	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	14
3	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	14
4	✗	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	12
5	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	12
6	✗	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	12
7	✓	✗	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	12
8	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	12
9	✗	✓	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	11
10	✗	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	11
11	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓	✗	✗	10
12	✗	✓	✗	✗	✓	✓	✓	✓	✗	✗	✓	✗	✓	✓	✓	9
13	✓	✓	✗	✗	✓	✗	✓	✓	✗	✗	✗	✓	✓	✓	✓	9
14	✗	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✓	✓	✗	9
15	✗	✗	✗	✓	✗	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	8
16	✗	✓	✗	✓	✓	✓	✓	✓	✗	✓	✗	✗	✓	✗	✗	8
17	✗	✓	✗	✗	✓	✓	✓	✓	✗	✓	✓	✗	✓	✗	✗	8
18	✗	✓	✗	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✗	8
19	✗	✓	✓	✗	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✗	7
20	✗	✗	✓	✗	✓	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	5
INCORRECT	12	4	8	9	1	2	1	5	19	9	7	5	0	6	7	
% INCORRECT	60	20	40	45	5	10	5	25	95	45	35	25	0	30	35	

The problem questions, working on an expected correct response of 70% to individual questions, are Q.No 1, 3, 4, 9, 10, 11 and 15.

CATEGORY TWO TEST

TABLE 5.4. STUDENTS WITH OBJECTIVES

TEST ITEMS MARKED CORRECT/INCORRECT

STUDENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14	SCORE
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
2	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	14
3	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	14
4	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
5	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
6	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	14
7	X	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	13
8	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	13
9	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	13
10	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
11	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	13
12	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	13
13	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	13
14	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	13
15	✓	✓	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	13
16	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	13
17	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	13
18	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	13
19	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	X	✓	✓	✓	12
20	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	12
21	✓	✓	X	X	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	11
INCORRECT	2	1	10	2	0	0	2	6	11	0	1	1	0	3	1	
% INCORRECT	9.5	4.8	4.6	9.5	0	0	9.5	28.5	524	0	4.8	4.8	0	1.3	4.8	

The problem questions or areas of work are questions '3' and '9' for those who had been given objectives they were required to know. This is working on an expected 70% correct response to individual questions.

CATEGORY ONE TEST

PROBLEM QUESTIONS (50% + INCORRECT)

TABLE 5.5.

WITH OBJECTIVES	WITHOUT OBJECTIVES
PROBLEM QUESTION NO NONE (NOTE Q3 = 44% ONLY)	PROBLEM QUESTION NO 3 = 68% INCORRECT 4 = 53% " 9 = 65% " 11 = 68% "

CATEGORY TWO TEST

PROBLEM QUESTIONS (50% + INCORRECT)

TABLE 5.6.

WITH OBJECTIVES	WITHOUT OBJECTIVES
PROBLEM QUESTION NO 9 = 52% (NOTE Q3 = 48% ONLY)	PROBLEM QUESTION NO 1 = 60% INCORRECT 9 = 95% INCORRECT (NOTE Q3 = 40% ONLY)

It can be seen that a considerable difference was found with the level of work obtained by students using objectives. Certain questions/objectives require scrutinizing, particularly questions 3 and 9 which received low marks in all sections.

CATEGORY THREE TESTS

The total numbers of motor vehicle CSE students taking part in these tests was as follows:-

TEST 1 :- 46 students received instructional objectives and formed group 'A'

39 students were taught traditionally and formed group 'B'

TEST 2 :- 38 students received instructional objectives and formed group 'B'

48 students were taught traditionally and formed group 'A'

TEST ONE

The 46 students who received the instructional objectives obtained a total score of 727 out of a possible 1150, a mean score of 15.804.

The 39 students who were taught by traditional means achieved a total score of 492 out a possible 975. This gave a mean score of 12.615.

A 't' test was carried out to judge the statistical significance of the mean difference.

't' was found to be 2.9495

with (46 - 1) + (39 - 1) = 83 degrees of freedom. From the tables of 't' distribution, 't' = 2.660 (less than) at the 0.01 level of significance. (i.e. P = 1 per cent) with 83 degrees of freedom.

We therefore conclude that the I.V. had an effect on the D.V., as the observed value of 't' is numerically greater than 2.660.

The specific instructional objectives produced a significantly increased mean score on this test.

TEST TWO

The 38 students who received the instructional objectives obtained a total score of 672 out of a possible 950, giving a mean score of 17.684.

The 48 students who were taught by the traditional methods obtained a total score of 732 out of a possible 1200. This gave a mean score of 15.25.

As previously a 't' test was carried out.

't' was found to be 3.4222

with (38 - 1) + (48 - 1) = 84 degrees of freedom. From the table of 't' distribution, 't' = 3.232 (less than) at the 0.002 level of significance (i.e. P = 0.2 per cent) with 84 degrees of freedom.

We therefore conclude that the I.V. had an effect on the D.V., as the observed value of 't' is numerically greater than 3.232, thus disproving as in the previous tests the null hypothesis that 'there is no true difference between the test scores of students who are taught by instructional objectives and those taught by traditional methods.'

TABLE 5.7. TEST ITEM 1 - 25 GROUP A TEST NO. 1 (WITH OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
1	✓	X	✓	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	✓	✓	✓	✓	X	X	✓	8
2	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	21
3	✓	✓	✓	X	X	X	X	X	✓	✓	X	✓	✓	X	X	✓	X	✓	X	✓	X	✓	✓	X	X	12
4	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	23
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	X	✓	✓	✓	23
6	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	22
7	✓	✓	✓	X	✓	✓	✓	✓	X	X	✓	X	✓	X	✓	X	✓	X	✓	✓	✓	✓	✓	X	X	16
8	X	X	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	✓	X	X	15
9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓	23
10	✓	X	✓	X	✓	✓	✓	✓	X	✓	X	✓	X	X	✓	✓	✓	X	✓	✓	✓	✓	✓	X	X	16
11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	X	✓	✓	✓	22
12	✓	X	X	X	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	X	✓	X	X	✓	✓	X	✓	✓	✓	16
13	✓	X	✓	X	X	X	✓	✓	X	✓	X	✓	✓	X	✓	✓	✓	X	X	X	X	X	✓	X	X	11
14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	24
15	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	22
16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	23

TABLE 5.7. CONTINUED TEST ITEM 1 - 25 GROUP A TEST NO. 1 (WITH OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
17	X	X	✓	X	X	X	X	X	X	✓	✓	✓	X	X	X	X	X	X	X	X	X	X	X	✓	X	5
18	X	X	✓	✓	X	X	X	X	X	X	✓	✓	X	X	X	X	X	X	X	X	X	X	✓	✓	X	6
19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	24
20	X	✓	X	X	X	X	X	✓	X	X	✓	✓	✓	X	X	X	✓	X	X	✓	X	X	✓	✓	✓	10
21	X	✓	X	X	X	X	X	X	✓	✓	X	X	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	X	11
22	X	X	X	✓	X	X	X	X	✓	X	X	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	X	X	X	11
23	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	23
24	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	X	21
25	✓	X	✓	X	X	X	X	X	✓	X	X	X	✓	X	X	✓	✓	X	✓	X	✓	✓	✓	X	✓	11
26	✓	✓	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓	X	✓	X	X	X	✓	✓	X	✓	X	X	12
27	✓	X	X	X	X	X	X	X	✓	X	✓	X	✓	X	X	X	X	X	X	✓	✓	X	X	✓	X	7
28	✓	✓	X	X	✓	✓	X	X	✓	X	X	✓	✓	X	✓	X	✓	X	✓	✓	✓	✓	X	✓	X	14
29	✓	✓	X	X	X	X	X	✓	✓	✓	✓	✓	X	✓	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	17
30	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	21
31	✓	✓	✓	X	X	X	X	X	X	X	X	✓	X	X	X	✓	X	X	X	X	X	X	X	X	X	5
32	✓	✓	X	X	✓	✓	✓	✓	X	X	X	✓	✓	X	X	✓	✓	X	✓	✓	✓	✓	✓	✓	X	16

TABLE 5.7. CONTINUED TEST ITEM 1 - 25 GROUP A TEST NO. 1 (WITH OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
33	✓	✓	X	X	X	X	X	X	X	X	X	✓	✓	X	X	X	X	X	X	X	X	X	X	X	X	4
34	✓	✓	✓	✓	X	✓	✓	✓	X	X	X	✓	✓	X	X	✓	✓	X	✓	✓	✓	✓	X	✓	X	16
35	✓	✓	X	X	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	19
36	✓	✓	X	X	X	X	X	X	X	X	X	✓	X	X	X	✓	X	X	X	X	X	X	X	X	X	4
37	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	20
38	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	22
39	✓	✓	✓	X	✓	X	X	✓	✓	X	✓	X	✓	X	X	✓	X	X	✓	✓	✓	✓	✓	X	X	14
40	✓	✓	X	X	X	X	X	X	✓	✓	✓	✓	✓	X	X	X	✓	X	✓	✓	✓	✓	X	✓	✓	14
41	✓	✓	✓	X	X	X	X	X	X	X	X	✓	✓	✓	X	X	✓	X	✓	✓	✓	✓	X	X	X	11
42	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	22
43	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	23
44	✓	✓	X	X	✓	✓	✓	✓	X	X	X	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	X	X	X	15
45	✓	X	✓	X	X	✓	✓	✓	X	X	X	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	X	X	X	14
46	✓	✓	✓	X	X	X	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	18
INCORRECT	6	12	15	31	20	19	18	16	22	19	19	6	7	29	24	14	11	32	16	8	9	13	13	18	25	
% INCORRECT	13	26	33	67	43	41	39	35	48	41	41	13	15	63	52	30	24	70	35	17	20	28	28	39	54	

TABLE 5.8 TEST ITEM 1 - 25 GROUP B TEST 1 (WITHOUT OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
1	✗	✗	✓	✓	✗	✓	✗	✓	✗	✓	✗	✓	✓	✗	✓	✗	✓	✗	✗	✗	✓	✗	✓	✓	✓	13
2	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✗	✗	✓	✗	17
3	✓	✗	✓	✗	✗	✗	✗	✓	✗	✓	✓	✓	✓	✗	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	16
4	✗	✗	✓	✓	✗	✓	✗	✗	✗	✓	✗	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	9
5	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	13
6	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	14
7	✗	✓	✓	✗	✗	✓	✓	✓	✓	✗	✗	✓	✗	✗	✓	✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	11
8	✗	✓	✓	✗	✗	✓	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	10
9	✓	✗	✗	✗	✗	✓	✗	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	16
10	✗	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✗	✓	✓	✗	✗	✓	✗	16
11	✗	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✗	✓	✓	✗	✓	✓	✗	✗	✓	✗	15
12	✗	✓	✓	✗	✗	✓	✓	✓	✗	✗	✓	✓	✓	✗	✓	✗	✓	✓	✗	✓	✓	✓	✗	✓	✗	15
13	✗	✓	✓	✓	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✓	9
14	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	✓	✓	✗	✓	✓	✓	11
15	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	6
16	✓	✓	✓	✓	✗	✓	✗	✗	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	17

TABLE 5.8. CONTINUED TEST ITEM 1 - 25 GROUP B TEST 1 (WITHOUT OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
17	X	X	✓	X	X	X	✓	X	X	✓	✓	✓	✓	✓	X	✓	X	X	✓	✓	✓	✓	X	X	X	12
18	X	X	✓	✓	X	X	X	X	✓	X	✓	✓	✓	✓	X	✓	X	✓	✓	X	X	✓	X	X	X	11
19	✓	✓	✓	X	X	X	X	X	X	✓	X	✓	X	X	✓	X	✓	X	X	✓	X	X	✓	X	X	9
20	X	✓	X	X	X	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	X	X	✓	✓	✓	16
21	✓	✓	✓	✓	X	✓	X	X	X	X	X	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	X	X	X	14
22	X	X	X	X	X	X	X	X	X	✓	X	✓	✓	✓	✓	X	X	✓	X	X	✓	X	X	X	✓	8
23	✓	✓	✓	✓	X	X	X	X	✓	X	X	X	X	✓	✓	✓	✓	✓	X	✓	X	X	✓	✓	✓	14
24	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	X	20
25	X	✓	✓	X	X	X	X	X	X	X	✓	✓	✓	X	✓	✓	✓	X	X	X	X	X	X	X	X	8
26	✓	X	X	✓	X	X	X	X	X	X	X	X	✓	X	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	10
27	✓	✓	✓	X	X	X	X	X	✓	✓	✓	✓	✓	X	X	X	X	✓	X	✓	X	X	✓	X	X	11
28	✓	✓	X	✓	X	X	X	X	X	X	✓	✓	✓	X	X	X	✓	X	X	✓	X	✓	✓	✓	✓	12
29	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	✓	✓	X	X	✓	✓	X	X	✓	X	✓	X	X	X	13
30	✓	✓	✓	X	X	X	X	X	✓	X	X	✓	✓	✓	X	✓	✓	✓	X	✓	✓	X	X	X	X	12
31	✓	✓	✓	X	✓	X	✓	✓	X	✓	✓	✓	✓	X	X	✓	X	X	X	✓	✓	X	✓	X	X	14
32	✓	X	✓	X	X	X	✓	X	X	X	✓	✓	✓	✓	✓	X	✓	X	X	X	✓	✓	X	X	X	11

TABLE 5.8. CONTINUED TEST ITEM 1 - 25 GROUP B TEST 1 (WITHOUT OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
33	✓	✓	✓	X	X	X	X	X	✓	✓	✓	✓	✓	X	X	X	✓	X	X	✓	X	X	X	X	X	10
34	✓	✓	✓	X	X	X	X	X	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	X	✓	X	16
35	✓	✓	✓	✓	X	X	X	X	X	✓	X	✓	X	X	✓	✓	✓	X	X	✓	✓	X	✓	X	X	12
36	✓	✓	✓	X	X	✓	X	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓	X	✓	X	✓	X	16
37	✓	X	✓	X	✓	X	X	X	X	✓	✓	✓	X	✓	X	✓	✓	✓	X	X	✓	X	✓	X	X	12
38	✓	✓	✓	X	X	X	X	X	✓	✓	X	✓	✓	X	X	✓	✓	X	X	X	X	X	X	X	X	9
39	✓	✓	✓	X	✓	X	X	X	X	✓	✓	✓	✓	X	X	✓	✓	✓	X	✓	✓	X	✓	X	X	14
INCORRECT	13	11	10	24	35	23	28	28	21	19	14	3	9	26	20	17	9	24	29	9	15	24	22	23	27	
% INCORRECT	33	28	26	62	90	59	72	72	54	49	36	8	23	67	51	44	23	62	74	23	38	62	56	59	69	

TABLE 5.9. TEST ITEM 1 - 25 GROUP A TEST 2 (WITHOUT OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
1	✓	X	X	X	✓	X	X	✓	✓	X	✓	X	X	✓	✓	✓	✓	X	X	X	X	✓	✓	X	✓	12
2	X	X	X	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	X	X	✓	17
3	X	✓	✓	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	X	✓	✓	17
4	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	X	✓	✓	17
5	X	✓	X	X	✓	X	X	✓	X	X	✓	X	X	✓	✓	✓	✓	X	X	✓	X	✓	X	X	✓	11
6	✓	X	X	✓	X	X	X	✓	✓	X	✓	✓	X	✓	✓	✓	✓	X	X	✓	X	✓	X	X	✓	13
7	X	X	X	X	✓	X	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	X	X	✓	✓	12
8	✓	X	X	X	✓	X	X	✓	✓	X	✓	X	X	✓	✓	✓	✓	X	X	X	X	✓	✓	X	✓	12
9	X	X	✓	X	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	X	✓	✓	15
10	X	X	X	X	X	X	X	X	✓	X	✓	X	X	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	7
11	X	X	X	X	X	✓	X	✓	✓	X	X	X	X	✓	✓	✓	✓	X	X	X	X	X	X	X	✓	8
12	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	18
13	X	X	X	X	X	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	✓	X	✓	13
14	X	✓	X	X	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	16
15	X	✓	✓	X	✓	✓	X	✓	✓	X	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	X	✓	✓	15

TABLE 5.9. (CONTINUED) TEST ITEM 1 - 25 GROUP A TEST 2 (WITHOUT OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
16	✓	✓	X	X	✓	✓	X	✓	X	X	✓	X	✓	✓	✓	X	X	✓	X	X	X	✓	X	X	✓	12
17	X	✓	✓	X	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	19
18	X	✓	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	X	X	16
19	X	✓	X	X	✓	✓	X	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	X	✓	X	✓	X	✓	✓	15
20	✓	✓	✓	X	✓	✓	X	X	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	X	✓	X	✓	✓	17
21	X	✓	X	X	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	18
22	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	✓	X	✓	✓	20
23	X	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	X	✓	✓	19
24	X	✓	X	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	X	X	✓	15
25	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	X	✓	X	X	✓	18
26	✓	✓	X	X	X	✓	X	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	17
27	✓	✓	✓	X	✓	✓	X	X	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	X	✓	X	✓	✓	17
28	✓	✓	X	X	✓	X	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	X	✓	X	✓	✓	✓	X	X	16
29	X	✓	X	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	X	✓	X	✓	✓	17
30	X	✓	X	X	✓	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	X	X	X	✓	X	X	✓	14

TABLE 5.9. (CONTINUED) TEST ITEM 1 - 25 GROUP A TEST 2 (WITHOUT OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
31	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✗	✓	✗	✓	✓	19
32	✓	✓	✗	✓	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✗	✗	✓	✓	✗	✓	✗	13
33	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✓	✗	15
34	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✓	✓	17
35	✓	✓	✗	✗	✓	✗	✗	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓	✗	✓	✓	16
36	✓	✓	✗	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✗	✓	16
37	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✓	✓	17
38	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✗	✓	14
39	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✓	✓	16
40	✓	✓	✗	✗	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✓	✓	16
41	✗	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✗	✓	19
42	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✗	✓	16
43	✓	✗	✗	✗	✓	✗	✗	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✓	✓	13
44	✗	✗	✓	✗	✗	✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓	✗	✓	✓	8
45	✗	✗	✗	✗	✓	✓	✗	✗	✓	✗	✓	✓	✗	✓	✓	✓	✓	✗	✗	✗	✗	✓	✓	✓	✓	13

TABLE 5.9. (CONTINUED) TEST ITEM 1 - 25 GROUP A (WITHOUT OBJECTIVES)

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
46	✓	X	X	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	X	X	✓	14
47	✓	X	X	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	X	X	✓	15
48	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓	✓	✓	✓	✓	22
INCORRECT	24	17	34	35	8	18	33	10	7	18	4	8	24	2	1	2	1	38	39	38	39	4	36	21	6	
% INCORRECT	50	35	71	73	17	38	69	21	15	38	8	17	50	4	2	4	2	79	81	79	81	8	75	44	13	

TABLE 5.10. TEST ITEM 1 - 25 GROUP B (WITH OBJECTIVES) TEST 2

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
1	✓	X	✓	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	X	✓	✓	17
2	✓	✓	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	21
3	✓	✓	✓	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	X	✓	✓	18
4	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	✓	✓	X	✓	✓	18
5	✓	X	✓	✓	✓	✓	X	✓	X	X	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	16
6	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	22
7	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	19
8	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	19
9	✓	X	✓	X	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	✓	✓	✓	✓	✓	18
10	✓	X	✓	X	✓	✓	X	X	X	X	X	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	✓	X	11
11	X	X	X	✓	✓	X	X	X	✓	✓	X	X	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	13
12	✓	X	✓	X	✓	X	X	✓	✓	X	X	✓	X	✓	✓	✓	✓	X	X	X	✓	✓	X	X	✓	13
13	✓	X	X	✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	17
14	✓	X	✓	X	✓	✓	✓	X	✓	X	✓	✓	X	✓	✓	✓	✓	X	X	X	X	X	X	X	✓	13
15	✓	X	✓	X	✓	✓	X	✓	✓	X	X	X	✓	✓	✓	✓	✓	X	✓	X	X	✓	✓	X	X	14
16	✓	✓	✓	✓	✓	X	X	✓	X	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	X	✓	✓	X	✓	16

TABLE 5.10. (CONTINUED) TEST ITEM 1 - 25 GROUP B (WITH OBJECTIVES) TEST 2

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
17	✓	X	✓	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	✓	✓	✓	X	✓	19
18	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	X	X	✓	✓	✓	✓	X	X	X	X	✓	X	✓	✓	16
19	✓	X	X	X	X	✓	X	✓	✓	X	✓	✓	X	✓	✓	✓	✓	X	X	X	X	X	X	X	✓	11
20	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	X	X	✓	✓	X	✓	19
21	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	X	✓	✓	X	✓	19
22	✓	✓	✓	X	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	X	X	✓	✓	X	✓	18
23	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	24
24	✓	X	✓	X	X	✓	X	✓	✓	X	✓	X	X	✓	✓	✓	✓	X	X	X	X	✓	X	X	✓	12
25	X	X	✓	X	✓	X	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	X	X	✓	✓	X	✓	15
26	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	X	✓	19
27	✓	X	✓	✓	X	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	✓	✓	✓	✓	X	✓	18
28	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓	X	✓	✓	19
29	✓	✓	✓	X	✓	X	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	X	18
30	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	X	✓	21
31	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	23
32	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	X	X	✓	X	X	✓	17

TABLE 5.10 (CONTINUED) TEST ITEM 1 - 25 GROUP B (WITH OBJECTIVES) TEST 2

STUDENT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	SCORE
33	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25
34	✓	X	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	X	✓	17
35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25
36	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	X	✓	✓	✓	X	X	X	X	✓	✓	X	X	16
37	✓	✓	X	✓	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓	X	X	✓	16
38	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	X	✓	✓	X	✓	20
INCORRECT	2	20	6	16	4	7	31	5	5	8	4	5	15	1	0	0	0	28	26	30	26	3	12	20	4	
% INCORRECT	5	53	16	42	11	18	82	13	13	21	11	13	39	3	0	0	0	74	68	79	68	8	32	53	11	

CATEGORY THREE TESTS

PROBLEM QUESTIONS (50% + INCORRECT)

GROUP A WITH OBJECTIVES

GROUP B WITHOUT OBJECTIVES

TEST 1 GROUP A		TEST 1 GROUP B	
PROBLEM QUESTION NUMBER	PERCENTAGE INCORRECT	PROBLEM QUESTION NUMBER	PERCENTAGE INCORRECT
4 *	67	4 *	62
14 *	63	5	90
15 *	52	6	59
18 *	70	7	72
25 *	54	8	72
		9	54
		14 *	67
		15 *	51
		18 *	62
		19	74
		22	62
		23	56
		24	59
		25 *	69

TABLE 5.11

The questions appearing in both groups 'A' and 'B' where difficulty occurred are marked with an asterisk. A comparison of the marks indicates that the group 'B' students (without objectives) achieved lower marks on average on the joint problem areas than group A who had received the objectives. There were a total of 14 problem questions noted in group B compared with 5 problem questions noted in group A. An examination of the questions/objectives where problems occurred should now be carried out.

CATEGORY THREE TESTS

PROBLEM QUESTIONS (50% + INCORRECT)

GROUP A WITHOUT OBJECTIVES GROUP B WITH OBJECTIVES

TEST 2 GROUP A		TEST 2 GROUP B	
PROBLEM QUESTION NUMBER	PERCENTAGE INCORRECT	PROBLEM QUESTION NUMBER	PERCENTAGE INCORRECT
1	50	2	53
3	71	7 *	82
4	73	18 *	74
7 *	69	19 *	68
13	50	20 *	79
18 *	79	21 *	68
19 *	81	24	53
20 *	79		
21*	81		
23	75		

TABLE 5.12

Of the 7 problem questions appearing in group B (with objectives) 5 of them also appeared in group A (without objectives). The clarity of the examination questions and objectives needs to be studied in all the seven questions/areas indicated, and in particular the objectives covering questions '2' and '24', as these appear in the 'with objectives group' and not in the ' non objective group'.

CHAPTER 6

EXPLORATORY CORRELATIONS

Correlations were made of the scaled responses given by the craft students under 18 years of age to questions 52 to 140 in the students' questionnaire. Correlations were also made for the purpose of comparisons of the lecturers' responses to the corresponding questions in the lecturers' questionnaire, numbers 5 to 93. These questions in both cases appeared in the index as questions 1 to 89.

The section dealing with student examination success was chosen as a sample for the purpose of an exploratory exercise.

All correlations were significant to at least the 0.01 level. A plus or a minus before the numerical value of the correlation indicates the direction of the relationship. Therefore a positive correlation coefficient indicates that the strong positive scores on one variable tend to be paired with the strong positive scores on the other variable. A negative correlation indicates that the strong positive scores on one variable tend to be paired with the more negative scores on the other variable.

EXAMINATION SUCCESS AT COLLEGE

QUESTION NUMBER 84

STUDENTS' QUESTION/STATEMENT 'Passing my college examination is important to me'.

TABLE 6.1

Questions correlating significantly with question number 84 in the craft students under 18 responses were:-

QUESTION NUMBER	CORRELATION COEFFICIENT
16	0.43585
18	0.348252
19	-0.305264
70	0.45306
73	0.371667
83	0.410218
*85	0.335195
*86	0.390448
*87	0.464563
*88	0.388834

LECTURERS' QUESTION/STATEMENT 'It is important to students to pass their examinations'.

Questions correlating significantly with this question number 84 in the lecturers' responses were:-

QUESTION NUMBER	CORRELATION COEFFICIENT
30	0.39011
57	0.471636
79	0.301805
*85	0.594653
*86	0.410461
*87	0.319054
*88	0.308001

* Responses correlating significantly in both students' and lecturers' questionnaires.

It can be seen that those students who thought strongly that it was important for them to pass their college examination had strong views on other matters and also:-

16) thought that when they chose to work at their firms, money was not the main consideration

18) looks forward to the day when they will be in a position of responsibility at their firms

19) are not at present looking for a complete change of employment away from the motor/transport trade

70) think that technology as a subject is important to them in their job

73) think that workshop practice as a subject is important to them in their job

83) think that syllabus information given objectively is very clear

85) agree that passing their college examination is important to them because it will give them personal satisfaction.

86) agree that passing their college examination is important to them because it will given them better career prospects

87) agree that passing their college examination is important because it will please their parents

88) agree that passing their college examination is important to them because it will please their employers

Lecturers who had strong opinions that it would be important for craft students to pass examinations because it would give them better career prospects also thought students would have strong opinions and felt that they would also

30) think that practical demonstrations by the lecturer are essential when teaching motor vehicle subjects

57) think that the principal aim of college lecturers is to bring about improved standards of skill in them

79) consider that as an aid to effective learning revision every few weeks would be very effective

Questions 85, 86, 87, 88 appear in both students' and lecturers' significant correlations and are therefore as reported in the students' section.

QUESTION NUMBER 85

STUDENTS' QUESTION/STATEMENT 'Passing my college examination is important to me because it will give me personal satisfaction.'

CRAFT STUDENTS UNDER 18 YEARS OF AGE

CORRELATING QUESTIONS TABLE 6.2

QUESTION NUMBER	CORRELATION COEFFICIENT
2	-0.361682
5	0.335936
7	-0.560538
19	-0.527684
58	0.317048
73	0.388344
*86	0.36477
*87	0.419917
*88	0.452657

LECTURERS

CORRELATING QUESTIONS

QUESTIONS NUMBER	CORRELATION COEFFICIENT
3	0.370543
30	0.402076
46	0.31948
79	0.366504

QUESTION NUMBER	CORRELATION COEFFICIENT
80	0.365765
84	0.594653
*86	0.461176
*87	0.507653
*88	0.348835
89	0.309809

Students who had strong opinions that passing their college examination was important to them because it would given them personal satisfaction expressed strong views in the questions shown and:-

2) do not think their job is unpleasant

5) consider their jobs to be interesting

7) do not consider their jobs to be boring

19) are not at present looking for a complete change of employment away from the motor/transport trade

58) think that it is important that students should be given a statement at the beginning of a teaching programme indicating the topics that are to be taught and the reasons why they have been included

73) think that the subject of workshop practice is important to them in their job

86) agree that passing their college examination is important to them because it will give them better career prospects

87) agree that passing their college examination is important to them because it will please their parents

88) agree that passing their college examination is important to them because it will please their employers.

Lecturers who had strong opinions that it was important for craft students to pass their college examination because it would give them personal satisfaction thought that students expressing these views would also

3) enjoy their jobs as much as their leisure time

30) think practical demonstrations by the lecturer are essential when teaching motor vehicle subjects

46) think that enthusiastic college lecturers make students enthusiastic

79) consider that, as an aid to learning, revision given every few weeks is very effective

80) consider that, as an aid to learning, revision given at the end of each term is very effective

84) think it important to pass their examinations

Questions 86, 87 and 88 appear in both students and lecturers significant correlations and are therefore as reported in the student sections.

89) be frightened/concerned with the thought of exam failure.

QUESTION NUMBER 86

STUDENT QUESTION/STATEMENT 'Passing my college examination is important to me because it will give me better career prospects.'

CRAFT STUDENTS UNDER 18 YEARS OF AGE TABLE 6.3

QUESTION NUMBER	CORRELATION COEFFICIENT
2	-0.426199
7	-0.595373
15	0.356308
19	-0.424085
25	0.297129
26	0.319584
30	0.35734

QUESTION NUMBER	CORRELATION COEFFICIENT
33	0.376119
*57	0.295501
59	0.312148
68	0.292958
70	0.322815
73	0.34713
*84	0.353362
*85	0.36477
*87	0.326066
*88	0.452066

LECTURERS'

CORRELATING QUESTIONS

QUESTION NUMBER	CORRELATION COEFFICIENT
12	0.293679
21	0.373496
37	0.295289
50	0.409808
51	0.368377
*57	0.369189
69	0.399678
76	0.304461
77	0.422049
79	0.456636
80	0.438544
81	0.345433
83	0.338631
*84	0.410461

QUESTION NUMBER	CORRELATION COEFFICIENT
*85	0.461176
*87	0.382344
*88	0.456963
89	0.459589

Students who had strong opinions that passing their college examination was important to them because it would give them better career prospects expressed strong views in the questions shown and:-

2) do not think their job unpleasant

7) do not consider their job to be boring

15) generally feel enthusiastic about their jobs

19) are not at present looking for a complete change of employment away from the motor/transport trade

25) think that lecturers in technical colleges need to be good practically in order to teach technical subjects effectively

26) think that generally speaking, lecturers at their technical college treat them with respect

30) think that practical demonstrations by the college lecturer are essential when teaching motor vehicle subjects

33) are of the opinion that all college lecturers they know are enthusiastic and seem to enjoy their work

57) think that the principal aim of college lecturers is to bring about improved standards of skill in their students.

59) think that it is important that the lecturer teaches the related topics of a syllabus in a clear and natural order

68) think that as a subject workshop practice is interesting

70) think that the subject technology is important to them in their job

73) think that the subject of workshop practice is important to them in their job

84) think that passing their college examination is important

85) think that passing their college examination will give them personal satisfaction

87) think that passing their college examination is important because it will please their parents

88) think that passing their college examination is important because it will please their employers.

Lecturers who quite strongly thought that it was important to students to pass their college examination because it would give them better career prospects also quite strongly thought that students would:-

12) like their day at work to be very busy

21) think that in order to succeed at college and pass examinations they must read text books

37) think that it is important that lessons at college start and finish on time

50) feel that lessons at college make them develop new ideas of their own

51) feel that at the end of their day at college they generally feel that they have learnt something

69) think that industrial/general studies is interesting

76) think that revision every few weeks is effective

77) think that revision at the end of each term is effective

79) consider that as an aid to learning tests would be effective when given every few weeks

80) consider that as an aid to learning tests would be effective when given at the end of each term

81) consider that as an aid to learning tests would be effective when given at the end of the course

83) consider that syllabus topics written objectively would be very clear to them.

*Question numbers 57, 84, 85, 87 and 88 appear in both students' and lecturers' correlations and are therefore as reported in the students section.

89) be frightened/concerned at the thought of examination failure

QUESTION NUMBER 87

STUDENTS' QUESTION/STATEMENT 'Passing my college examination is important to me because .it will please my parents.'

CRAFT STUDENTS UNDER 18 YEARS OF AGE

CORRELATING QUESTIONS TABLE 6.4.

QUESTION NUMBER	CORRELATION COEFFICIENT
2	-0.466762
7	-0.436812
8	0.355625
19	-0.472638
31	-0.351941
58	0.352828
68	0.290195
73	0.324228
*85	0.419917
*86	0.326060
*88	0.470374

LECTURERS

CORRELATING QUESTIONS

QUESTION NUMBER	CORRELATION COEFFICIENT
52	0.29552
59	0.292065

QUESTION NUMBER	CORRELATION COEFFICIENT
79	0.300588
80	0.461388
84	0.319054
*85	0.507655
*86	0.382344
*88	0.4915

Those students who thought strongly that it was important to them to pass their college examination because it would please their parents, also had strong views on the following and:-

2) do not think their job unpleasant

7) do not consider their job to be boring

8) enjoy their job more than the average worker

19) are not at present looking for a complete change of employment away from the motor/transport trade

31) do not think that lecturers who swear in class are generally poor teachers

58) think it important that students should be given a statement at the beginning of a teaching programme indicating the topics that are to be taught and the reasons why they have been included

68) think the subject of workshop practice is interesting

73) think that the subject of workshop practice is important to them in their jobs

85) think that passing their college examination will give them personal satisfaction

86) think that passing their college examination will give them better career prospects

88) think that passing their college examination is important because it will please their employers.

Lecturers who thought quite strongly that it would be important to students to pass their college examination because it would please their parents also thought students would have strong opinions and would also

52) think that they are encouraged to work together at college

59) think it important that the lecturer teaches the related topics of the syllabus in a clear and natural order

79) think that as an aid to learning, tests given every few weeks would be effective

80) think that as an aid to learning, tests given at the end of each term would be effective

84) think that passing their college examination is important to them

Questions 85, 86 and 88 appear on both students' and lecturers' significant correlations to this question and are therefore as reported in the students section.

QUESTION NUMBER 88

STUDENTS' QUESTION/STATEMENT 'Passing my college examination is important to me because it will please my employers.'

CRAFT STUDENTS UNDER 18 YEARS OF AGE

CORRELATING QUESTIONS TABLE 6.5.

QUESTION NUMBER	CORRELATION COEFFICIENT
2	-0.497804
7	-0.632356
9	-0.300203
15	0.450704
19	-0.431368
42	-0.322409
45	-0.444949
58	0.332618
59	0.371242
73	0.517428
*84	0.424594
*85	0.452657
*86	0.452066
*87	0.470374

LECTURERS

CORRELATING QUESTIONS

QUESTION NUMBER	CORRELATION COEFFICIENT
4	0.304683
20	0.517046
33	0.312428
37	0.503497
40	0.371411

QUESTION NUMBER	CORRELATION COEFFICIENT
43	0.296178
44	0.325827
51	0.442029
52	0.304567
54	0.436258
56	0.33735
79	0.44044
*84	0.308001
*85	0.348835
*86	0.456963
*87	0.4915

Students who thought strongly that it was important to them to pass their college examination because it would please their employers also had strong views on the following and:-

2) do not think their job unpleasant

7) do not consider their job to be boring

9) do not think their work gives them real enjoyment

15) generally feel enthusiastic about their jobs

19) are not at present looking for a complete change of employment away from the motor/transport trade

42) do not think the academic content of their course is perfectly adequate

45) do not think that all the syllabus topics covered at college are relevant to their jobs

58) think that it is important that students should be given a statement at the beginning of a teaching programme indicating the topics that are to be taught and the reasons why they have been included.

59) think that it is important that the lecturer teaches the related topics of the syllabus in a clear and natural order

73) think that, as a subject, workshop practice is important to them in their job

84) think that passing their college examination is important to them

85) think that passing their college examination is important to them because it will given them personal satisfaction

86) think that passing their college examination is important to them because it will given them better career prospects

87) think that passing their college examinations is important to them because it will please their parents

Lecturers who had strong opinions that it would be important to craft students to pass their examinations because it would please their employers also thought students would have strong opinions and would also:-

4) think that their friends envied them their jobs

20) feel that they receive encouragement from their employers to do well at their college studies

33) think that most of the college lecturers they know are enthusiastic and seem to enjoy their work

37) think that it is important that lessons at college start and finish on time

40) feel that the college staff would help them if they found themselves in difficulties, either at work or at home

43) feel that their friends and acquaintances are impressed when they tell them that they are attending college

44) feel that the college staff should take an interest in their problems, both inside and outside the college

51) think that at the end of the day they go home feeling as though they have learnt something

52) think that they are encouraged to work together at college

54) think that good use is made by the lecturers of visual aid materials and equipment

56) feel that college lecturers are generally sympathetic to their study problems

79) think that revision given every few weeks is an effective aid to learning

Questions 84, 85, 86 and 87 appear in both students' and lecturers' significant correlations and are as reported in the students section.

QUESTION NUMBER 89

STUDENTS' QUESTION/STATEMENT 'The thought of failure frightens/ concerns me.'

CRAFT STUDENTS UNDER 18 YEARS OF AGE

CORRELATING QUESTIONS TABLE 6.6.

QUESTION NUMBER	CORRELATION COEFFICIENT
64	0.347598
75	0.418997

LECTURERS

CORRELATING QUESTIONS

QUESTION NUMBER	CORRELATION COEFFICIENT
4	0.325261
8	0.321787
15	0.313145
34	0.290336
69	0.405355
76	0.456636
79	0.304122
83	0.365972

QUESTION NUMBER	CORRELATION COEFFICIENT
85	0.309809
86	0.459589

Students who strongly agreed that the thought of failure frightened/concerned them also strongly agreed:-

64) that it was important, when starting a new topic, to know how much time is available to complete it

75) that it was important that they be consulted on the teaching order of course topics.

Lecturers who had strong opinions that the thought of failure would frighten/concern students, also thought that students would:-

4) think that their friends envied them their jobs

8) think that they enjoy their jobs more than the average worker

15) generally feel enthusiastic about their jobs

34) think that their college is usually fair but tough with them

69) think that the subject of industrial/general studeis is interesting

76) find revision every few weeks effective

79) consider that, as an aid to learning, tests given every few weeks would be effective

83) consider that syllabus topics presented objectively are clearly understood

85) think that passing their college examinations is important to them because it will given them personal satisfaction

86) think that passing their college examination is important to them because it will given them better career prospects.

CORRELATION COEFFICIENTS (CONCLUSIONS)

The outcome of correlating the questions which related to the student's opinions and attitudes with regard to his college examination was in the main as expected, there being no "rogue" or "unrelated" correlating questions. The correlation which came closest to causing confusion was question number 9 as correlated with question 88. The students who indicated that they 'do not think their job unpleasant', 'do not consider their job to be boring', and who 'generally feel enthusiastic about their job', produced a negative correlation for question 9, which was 'my job gives me real enjoyment'. Students overall indicated that their jobs gave them 'enjoyment' and perhaps if this question/statement was rewritten and the word "real" was excluded, the results for the students in question would probably have correlated positively. "Real enjoyment" would probably be reserved to describe the ultimate enjoyment that the student might experience, and of course this is not necessarily his job of work, even though generally he indicates that he likes his job and is enthusiastic about it.

CHAPTER 7

HOME AND BACKGROUND

( ) indicates number in student questionnaire

1) (1)

The students were asked to name the college they were attending. This was mainly for geographical purposes; a similar question was not asked on the lecturers' questionnaire as the numbers involved were considerably lower and it was comparatively easy to monitor the origins of the completed questionnaires.

Colleges where staff and/or students were asked to participate in filling in these questionnaires either directly by the writer or through the Further Education Staff Centre, Durham were Ashington Technical College, Darlington College of Technology, New College Durham, Gateshead Technical College, Stockton and Billingham Technical College, all these colleges being situated in the North East of England, all offering motor vehicle courses and all coming under the auspices of the Northern Counties Technical Examination Council.

2) (2)

For the purposes of comparison between the opinions and attitudes of students and how lecturers interpret these opinions and attitudes, five groups were formed as follows:-

1) 94 Motor Vehicle Craft Students under 18 years of age
2) 94 Motor Vehicle Craft Students over 18 years of age
3) 94 Motor Vehicle Technician Students under 18 years of age
4) 94 Motor Vehicle Technician Students over 18 years of age
5) 74 Motor Vehicle College Lecturers

There were 70 lecturers out of the total 74 who had knowledge of and had taught motor vehicle technicians as well as craft students, all 74 having taught craft students. Lecturers, when answering the various questions/statements in their questionnaire, were asked to answer for both craft and technician students, the reason for this being to see if they thought opinions and attitudes varied between these groups. It can be seen from the following charts that a great number of the lecturers did not consider that the two groups would differ greatly in their opinions.

Column 1 of the chart shows the question number as it appears in the lecturers' questionnaire, while column 2 represents the percentage of lecturers who consider that there would be no differences between the attitudes and opinions of craft and technician students to the particular question indicated.

TABLE 7.1

COLUMN 1	COLUMN 2
QUESTION NO.	PERCENTAGE
5	76
6	70
7	78
8	81
9	64
10	51
11	68
12	76
13	68
14	76
15	76
16	73

COLUMN 1	COLUMN 2
QUESTION NO.	PERCENTAGE
17	70
18	65
19	65
20	78
21	73
22	46
23	66
24	61
25	49
26	82
27	84
28	68

COLUMN 1	COLUMN 2
QUESTION NO.	PERCENTAGE
29	85
30	64
31	78
32	78
33	85
34	86
35	80
36	70
37	70
38	78
39	84
40	69
41	77
42	74
43	73
44	70
45	76
46	76
47	74
48	69
49	68
50	66
51	70
52	74
53	72
54	68
55	65
56	78
57	80
58	77
59	77
60	65
61	66

COLUMN 1	COLUMN 2
QUESTION NO.	PERCENTAGE
62	66
63	81
64	78
65	69
66	76
67	77
68	62
69	68
70	34
71	38
72	73
73	72
74	81
75	58
76	55
77	74
78	72
79	81
80	65
81	72
82	74
83	73
84	72
85	76
86	74
87	78
88	70
89	64
90	55
91	80
92	78
93	57

For statistical purposes the four lecturers who had no experience of technician students and who had passed no opinions with regard to technician students were considered to have answered neutrally to all technician questions. Taking an overall percentage average of all the responses to all questions it was found that 71% of the lecturers thought that there would be no difference between the opinions and attitudes of craft and technician students.

On inspection it was found that the question/statement numbers upon which lecturers felt the students were most likely to disagree were question numbers (as they both appear in the index 1 - 89) 18; 20; 21; 51; 64; 66; 67; 71; 72; 86; 89. As it was such a small number of questions about which lecturers thought that opinions and attitudes of craft and technician students would be different, it was thought prudent to show the one set of craft results when reporting the results from the lecturers' response scales and to indicate in the relevant areas where results differ.

3) (5)

At the time of filling in the questionnaire, the students were asked to indicate their ages in years and months. The main reason for this request was to place the students into one of four groups and to make comparisons, where possible, of opinions and attitudes of students under 18 years of age with the opinions and attitudes of students over 18 years of age.

The average ages of the four groups of students were as follows:-

1) Motor Vehicle Craft students under 18 years of age = 17 years 3 months
2) Motor Vehicle Craft students over 18 year of age = 19 years
3) Motor Vehicle Technician students under 18 years of age = 17 years 2 mths
4) Motor Vehicle Technician students over 18 years of age = 19 years 1 month

4) (6)

The numbers of students married within these groups is indicated in the following:-

TABLE 7.2.

GROUP	NUMBER OF STUDENTS MARRIED
Craft Students under 18	1
Craft Students over 18	2
Tech. Students under 18	0
Tech. Students over 18	4

It can be seen that only one student of those aged under 18 was married, while there were 6 students married in the over 18 groups. In all 1.9% of students were married.

5) (7 - 10)

The living accommodation of the seven married students is as follows:- The craft student under 18 years of age owned his own house. One of the two craft students over 18 was in lodgings and the other was buying his own house. Of the four technician students over 18, three were buying their own homes and one was renting his house.

6) (11)

The majority of students taking part attended comprehensive schools, a much smaller number having attended grammar schools

TABLE 7.3.

STUDENT GROUP	% ATT. COMP SCHOOLS	% ATT. GRAMMAR SCHOOLS
Craft under 18	96	4
Craft over 18	91	9
Tech. under 18	96	4
Tech. over 18	95	5

On average 94.5% of all students had attended a comprehensive school.

7) (12)

On inspection of the details shown in table 7.4. it can be seen that a total of 16 students (4%) live away from the family home. After deducting the 7 married students living in their own homes this leaves 9 students not married but still living away from the parental home, 7 of these students belonged to the over 18 groups and the remaining 2 students belonged to the technician under 18 groups.

8) (13 -19)

A most significant observation deduced from the figures given by students living in the family home in table 7.5. is the fact that there are greater numbers of 'mothers' than 'fathers' living in the family home. Taking all groups together there are 332 fathers which represents 88% of the total possible, while mothers total 374 giving 99% of the total possible.

The 376 males filling in these questionnaires had 301 brothers and 256 sisters, therefore there were 677 male sons and 256 daughters. The average number of male 'children' per household is 1.8 and the average number of female 'children' per household is 0.681, therefore the total average number of children per household is 2.481.

There were 10 homes in which one grandparent lived, there being no homes in which both grandparents lived. Eleven students indicated that there was one other person living in the family home which could be a relative or lodger.

The average number of people living in each home represented by these students was 4.37 (this figure taking into account those students living away from the family home).

TABLE 7.4.

STUDENTS LIVING IN FAMILY HOME

GROUPS	RESPONSES
Craft under 18 yrs	YES - 93 NO - 1
Craft over 18 yrs	YES - 89 NO - 5
Tech. under 18 yrs	YES - 92 NO - 2
Tech. over 18 yrs	YES - 86 NO - 8

TABLE 7.5.

PERSONS LIVING IN FAMILY HOME AND HOUSING DETAILS

PERSONS LIVING IN FAMILY HOME	CRAFT STUDENTS UNDER 18 YRS	CRAFT STUDENTS OVER 18 YRS	TECH STUDENTS UNDER 18 YRS	TECH STUDENTS OVER 18 YRS
FATHER	83	80	83	86
MOTHER	94	93	93	94
1 BROTHER	33	27	35	36
2 BROTHERS	16	16	13	10
3 BROTHERS	5	2	2	4
4 BROTHERS	2	1	1	0
5 BROTHERS	1	0	0	0
1 SISTER	35	31	30	29
2 SISTERS	12	12	7	8
3 SISTERS	2	3	4	3
4 SISTERS	1	2	0	0
5 SISTERS	0	0	0	1
1 GRANDPARENT	0	4	4	2
2 GRANDPARENTS	0	0	0	0
OTHERS	3	2	5	1

TABLE 7.5 CONTINUED

HOUSING DETAILS	CRAFT STUDENTS UNDER 18 YRS	CRAFT STUDENTS OVER 18 YRS	TECH STUDENTS UNDER 18 YRS	TECH STUDENTS OVER 18 YRS
RENTED	34	35	42	26
OWNER OCCUPIER	60	59	52	68
TERRACED	29	38	33	27
SEMI-DETACHED	39	38	45	46
DETACHED	26	18	16	21

9) (20 - 24)

Concerning the actual housing details, (table 7.5.), on inspection of all groups of students and the type of house in which they live, it is clear that there are no basic differences in the type of property lived in by any groups.

By far the most popular type of property is the semi-detached house followed by terraced properties, a smaller number of students living in detached houses. It is interesting to see that 64% of the students live in semi-detached homes, 34% living in terraced homes, while 21% live in detached homes.

10) (25 - 28)

Students were asked to specify as accurately as they could the job description, qualifications and ages of their fathers, mothers, brothers and sisters. There were no problems with either the job description or the qualification details required but the students were unsure about the ages of the members of their families so the information extracted from the questionnaires concentrates on job descriptions and qualifications.

The job descriptions given by students were classified into the five social classes as depicted by Cole (1964) for heads of households in Great Britain, examples of these social classes being:-

<u>SOCIAL CLASS I</u>

Higher administrative, professional and managerial workers, including large employers.

<u>SOCIAL CLASS II</u>

Farmers, intermediate administrative, professional and managerial workers including teachers, shopkeepers and small employers.

<u>SOCIAL CLASS III</u>

Clerical workers, shop assistants, foremen and supervisors, personal services, skilled workers.

SOCIAL CLASS IV

Semi-skilled workers, agricultural labourers.

SOCIAL CLASS V

Unskilled workers, armed forces (other ranks)

Although the social class groupings are designed for the working heads of households it was thought to be of interest to look at the category into which the other working members of the family fell also.

TABLE 7.6.

RELATIVE	CRAFT UNDER 18	CRAFT OVER 18	TECHN. UNDER 18	TECHN. OVER 18
FATHER	N = 78	N = 70	N = 82	N = 80
S CLASS 1	0 = 0%	0 = 0%	0 = 0%	1 = 1%
S CLASS 2	13 = 17%	11 = 16%	18 = 22%	20 = 25%
S CLASS 3	42 = 54%	42 = 60%	39 = 48%	37 = 46%
S CLASS 4	7 = 9%	3 = 4%	8 = 10%	5 = 6%
S CLASS 5	16 = 21%	14 = 20%	17 = 21%	17 = 21%
MOTHER	N = 47	N = 51	N = 57	N = 46
S CLASS 1	0 = 0%	0 = 0%	0 = 0%	1 = 2%
S CLASS 2	6 = 13%	6 = 12%	4 = 7%	7 = 15%
S CLASS 3	26 = 55%	28 = 55%	34 = 60%	24 = 52%
S CLASS 4	3 = 6%	6 = 12%	2 = 4%	4 = 9%
S CLASS 5	13 = 28%	9 = 18%	17 = 30%	10 = 22%
BROTHERS	N = 56	N = 36	N = 48	N = 62
S CLASS 1	0 = 0%	2 = 6%	1 = 2%	2 = 3%
S CLASS 2	5 = 9%	4 = 11%	6 = 13%	10 = 16%
S CLASS 3	31 = 55%	23 = 64%	32 = 67%	31 = 50%
S CLASS 4	4 = 7%	0 = 0%	3 = 6%	4 = 6%
S CLASS 5	16 = 29%	7 = 19%	6 = 13%	15 = 24%
SISTERS	N = 20	N = 33	N = 26	N = 30
S CLASS 1	0 = 0%	0 = 0%	0 = 0%	3 = 10%
S CLASS 2	1 = 5%	3 = 9%	1 = 4%	2 = 7%
S CLASS 3	14 = 70%	27 = 82%	18 = 69%	22 = 73%
S CLASS 4	2 = 10%	0 = 0%	2 = 8%	2 = 7%
S CLASS 5	3 = 15%	3 = 9%	5 = 19%	1 = 3%

For the purpose of social category placement, apprentices or trainees were given the grading they would enjoy when classified as fully skilled or trained. It must also be remembered that all the students taking part in this work by this criterion would fall into social class category III. It is quite clear from table 7.6 that by far the largest percentage of all relatives also fall into category III. The fathers of technician students tend to show higher percentages in social class categories I and II. For example, by taking percentage averages in these categories the figures show that craft students' fathers score 16.5% while the technician students' fathers score 24%. This pattern is followed to a lesser extent in the brothers, the craft and technicians' brothers averaging 13% and 17% respectively.

Social class categories of mother and sisters do not alter appreciably in the different student groups, although it is interesting to note that the sisters of technician students over 18 years of age record the highest score in social class category I of any group.

QUALIFICATIONS OF PARENTS, BROTHERS AND SISTERS

CRAFT STUDENTS

Craft students listed 8 fathers as having qualifications, these including 1 with a City and Guilds Certificate, 1 with a Higher National Certificate, 3 with G.C.E. 'O' levels, 2 with both G.C.E. 'O' levels and 'A' levels and degrees and 1 with a Diploma.

Only 3 mothers were indicated to have qualifications, these consisting of 2 with G.C.E. 'O' levels and 1 with a City and Guilds Certificate.

There were 15 brothers listed as having qualifications, including 4 with G.C.E. 'O' and 'A' levels (2 of these having degrees), 5 with 'O' levels, 3 with C.S.E's and 3 with City and Guilds Certificates.

Eight sisters were reported to have qualifications, 2 having G.C.E. 'O' and 'A' levels, 3 having 'O' levels only and 3 having C.S.E's.

The fathers of the craft students were better qualified than their wives, but to make comparisons, for example, between fathers and brothers would be difficult at this stage because it is quite possible and quite probable that brothers are still gaining qualifications, this being unlikely with most fathers. At the time of filling in the questionnaire approximately twice as many qualifications can be claimed by 'brothers' than their fathers (there being 163 fathers and 161 brothers listed by craft students as being employed).

TECHNICIAN STUDENTS

From the information received it appears that the fathers and mothers of technician students have less qualifications than the craft students' parents.

The fathers of technician students having qualifications number 6, these including 3 with G.C.E. 'O' levels, 1 with both 'O' and 'A' levels and 2 with City and Guilds Certificates.

Only 2 mothers were credited with qualifications, these being 1 with a G.C.E. 'O' level and 1 with both G.C.E. 'O' and 'A' levels.

The brothers of technician students more than compensated for the lack of qualifications of their parents, the technicians brothers having more qualifications than any other group. These include 7 with G.C.E. 'O' levels, 5 with C.S.E's, 5 with G.C.E. 'O' and 'A' levels, 2 of these having degrees, 2 with 'O' levels and C.S.E's and 4 with City and Guilds Certificates. (23 with qualifications).

The sisters of technician students follow a similar pattern to their brothers when compared with brothers and sisters of craft students in that 12 (compared with 8) were credited with qualifications as follows: 1 with C.S.E's, 4 with G.C.E. 'O' and 'A' levels, one of these having C.S.E's also, 6 with G.C.E. 'O' levels only and 1 sister with G.C.E. 'O' and 'A' levels and a degree.

CHAPTER 8

HOBBIES AND PASTIMES

1) (35)

There was a total of 55 hobbies/pastimes listed by all students. The top six of these hobbies as listed by the various groups of students are illustrated in the following table:-

TABLE 8.1

GROUPS OF STUDENTS AND % POPULARITY OF THE TOP 6 HOBBIES/PASTIMES							
CRAFT UNDER 18		CRAFT OVER 18		TECH. UNDER 18		TECH. OVER 18	
HOBBY	%	HOBBY	%	HOBBY	%	HOBBY	%
MOTORBIKES	34	CARS	34	MOTORBIKES	31	CARS	29
CARS	24	MOTORBIKES	24	FOOTBALL	21	DRINKING	24
FOOTBALL	22	DRINKING	23	CARS	16	MUSIC/DISCO	19
MUSIC/DISCO	17	WOMEN	20	MUSIC/DISCO	14	MOTORBIKES	19
WOMEN	13	FOOTBALL	16	WOMEN	11	WOMEN	13
DRINKING	7	MUSIC/DISCO	14	FISHING	10	FOOTBALL	11
				DRINKING	10	SNOOKER/POOL	10

It can be seen from this table that all groups listed the following:- motorbikes, cars, football, music/discos, and women as their main hobbies/pastimes.

The only hobbies mentioned in the top six that did not appear in all groups were fishing and snooker/pool, both of these appearing at the bottom of the lists of the technician groups. The most popular hobbies overall appear to be cars and motorcycles.

A complete list of all hobbies and pastimes can be seen in table 8.2.

ALL HOBBIES AND PASTIMES MENTIONED BY STUDENTS

TABLE 8.2. N = 94

HOBBIES/PASTIMES	CRAFT UNDER 18	CRAFT OVER 18	TECH UNDER 18	TECH OVER 18
WOMEN	12	19	10	12
CARS	23	32	15	27
MUSIC/DISCOS	16	13	13	18
SHOOTING	5	2	7	6
WATER-SKIING	1	-	-	-
MOTORBIKES	32	23	29	18
CANOEING	1	-	2	1
FOOTBALL	21	15	20	10
SNOOKER/POOL	5	4	7	9
FARMING	2	1	1	-
FISHING	6	8	9	2
SWIMMING	6	1	8	3
DRINKING	7	22	9	23
ANIMALS	2	3	-	3
KARATE	1	1	-	-
BADMINTON	1	-	1	1
KUNG FU	1	-	1	-
BOXING	1	1	1	-
DARTS	3	4	4	6
READING	3	1	2	-
DRAWING/PAINTING	2	3	1	2
MODEL MAKING	3	1	4	4
TROPICAL FISH	1	-	-	1
MUSICAL INSTRUMENTS	3	-	2	-
ALL SPORTS	6	5	4	4
CRICKET	2	3	1	5
T.V.	1	3	1	2
TRAINSPOTTING	1	2	2	2
RUGBY	1	-	2	3
GO-KARTS	1	-	1	-
CARDS	1	-	-	1

TABLE 8.2 CONTINUED

HOBBIES/PASTIMES	CRAFT UNDER 18	CRAFT OVER 18	TECH UNDER 18	TECH OVER 18
TABLE TENNIS	1	-	2	-
CYCLING	1	1	3	1
CAMPING	1	2	2	1
CHESS	1	-	-	-
PHOTOGRAPHY	-	2	1	-
STAMPS	-	1	1	1
BASKETBALL	-	-	1	-
GOLF	-	1	1	-
SQUASH	-	1	1	2
CADETS	-	-	1	-
CINEMA	-	3	1	-
GARDENING	-	2	1	1
VOLLEYBALL	-	-	1	1
WALKING	-	1	1	1
COINS	-	-	-	1
TENNIS	-	-	-	1
CUB/SCOUT LEADER	-	1	-	2
ELECTRONICS	-	-	-	2
PT TIME POLICE OFF	-	-	-	1
LOCAL HISTORY	-	-	-	1
ENTERTAINING	-	1	-	-
SMOKING	-	2	-	-
WEIGHT LIFTING	-	1	-	-
WRITING	-	1	-	-

2) (36)

The students who play or have played musical instruments can be seen in the following:-

TABLE 8.3.

	CRAFT UNDER 18 YEARS	CRAFT OVER 18 YEARS	TECH. UNDER 18 YEARS	TECH. OVER 18 YEARS
PERCENTAGE PLAYING MUSICAL INSTRUMENT	20	20	34	37

It can be seen from this table that an average of 23.5% of craft students play or have played a musical instrument compared with the technician students average of 35.5%

Table 8.4. shows the full range of instruments that the students listed and includes the numbers from each group who had actually played the particular instrument.

Making comparisons between craft and technician students within the same age limits, it can be seen that in the under 18 years of age groups the technician under 18 groups have played 35% more instruments than the under 18 craft group. The technicians over 18 years of age have played 51% more musical instruments than the comparable over 18 years of age craft group.

These figures also highlighed the fact that, as far as these students were concerned, the tendency was that the older students seemed to have had more opportunity to actually play an instrument or alternatively the popularity of musical instruments as a hobby has diminished. From discussions with students the former reason given is probably the most accurate.

TABLE 8.4

N = 94

MUSICAL INSTRUMENTS PLAYED	NO. OF STUDENTS IN EACH GROUP PLAYING INSTRUMENT			
	CRAFT UNDER 18 YEARS	CRAFT OVER 18 YEARS	TECH. UNDER 18 YEARS	TECH. OVER 18 YEARS
GUITAR	11	11	12	13
PIANO	5	6	6	10
DRUMS	7	3	4	7
RECORDER	0	4	7	7
TRUMPET	2	4	4	2
TROMBONE	0	4	1	5
CORNET	0	2	3	3
ORGAN	0	2	2	3
VIOLIN	2	2	1	2
SAXOPHONE	2	2	0	1
MOUTHORGAN	0	1	0	3
FLUTE	0	1	0	3
HORN	0	0	1	2
BANJO	0	0	0	2
BAGPIPES	2	0	0	0
OBOE	0	0	0	1
ACCORDION	0	0	0	1
TUBA	0	1	0	0
CLARINET	0	0	1	0
TOTALS	31	43	42	65

3) (37)

When asked if they like poetry, all students were unanimous in that the majority of all groups disliked poetry. The percentages of students saying that they like poetry for the craft students under 18 was 13%, for the craft over 18, 16%, for the technicians under 18, 16% and for the technician over 18, 17%.

4) (43 - 46) (2 - 3)

MEMBERSHIP OF LIBRARIES

Regarding the membership of libraries 54% of all craft students were members of college libraries and, by coincidence, exactly the same percentage of all technician students were members of the college library.

There were 37% of craft students members of public libraries as opposed to 36% of technician students.

There does not seem to be any pattern emerging from the number of members of public libraries within the groups but, concerning memberships of the college library, students were more likely to be members as they got older, the craft over 18 group having 97% more student members than their younger counterparts. The technicians over 18 had 20% more college library members than the technicians under 18.

BOOKS READ

From the results plotted in table 8.5 it is sad to see that so many students admit that they do not read books, neither technical books that would help them with their course at college nor general reading books for pleasure. The percentages of students who have not read a single book in the twelve month period preceding giving this information can be seen in table 8.6.

TABLE 8.5

MEMBER OF	CRAFT STUDENT UNDER 18 YRS		CRAFT STUDENT OVER 18 YRS		TECH STUDENT UNDER 18 YRS		TECH STUDENT OVER 18 YRS	
	YES	NO	YES	NO	YES	NO	YES	NO
COLLEGE LIBRARY	34	60	67	27	46	48	55	39
PUBLIC LIBRARY	42	52	28	66	32	62	35	59
BOOKS READ	TECH	PLEAS	TECH	PLEAS	TECH	PLEAS	TECH	PLEAS
0	64	54	39	31	38	47	21	31
1	6	4	13	8	18	5	16	6
2	10	5	9	10	12	8	19	14
3	4	6	8	7	8	7	5	8
4	2	6	8	7	6	4	9	5
5	3	1	4	5	3	4	6	3
6	2	2	4	1	-	1	7	3
7	1	2	2	3	1	1	-	1
8	-	-	2	2	-	1	-	1
9	-	-	-	-	1	1	-	-
10	-	2	2	7	2	1	7	2
11	-	-	-	-	-	1	-	-
12	2	2	-	3	1	1	1	4
14	-	-	-	-	-	1	-	-
15	-	-	-	-	-	3	-	1
16	-	-	-	-	-	-	-	1
18	-	-	-	1	-	-	-	-
20	-	2	1	3	-	4	1	4
24	-	-	-	-	-	1	-	-
25	-	-	-	1	1	1	1	1
29	-	-	1	-	-	-	-	-
30	-	-	1	1	2	1	-	1
40	-	-	-	-	-	1	-	-
50	-	8	-	2	1	-	1	8
54	-	-	-	1	-	-	-	-
100	-	-	-	1	-	-	-	-

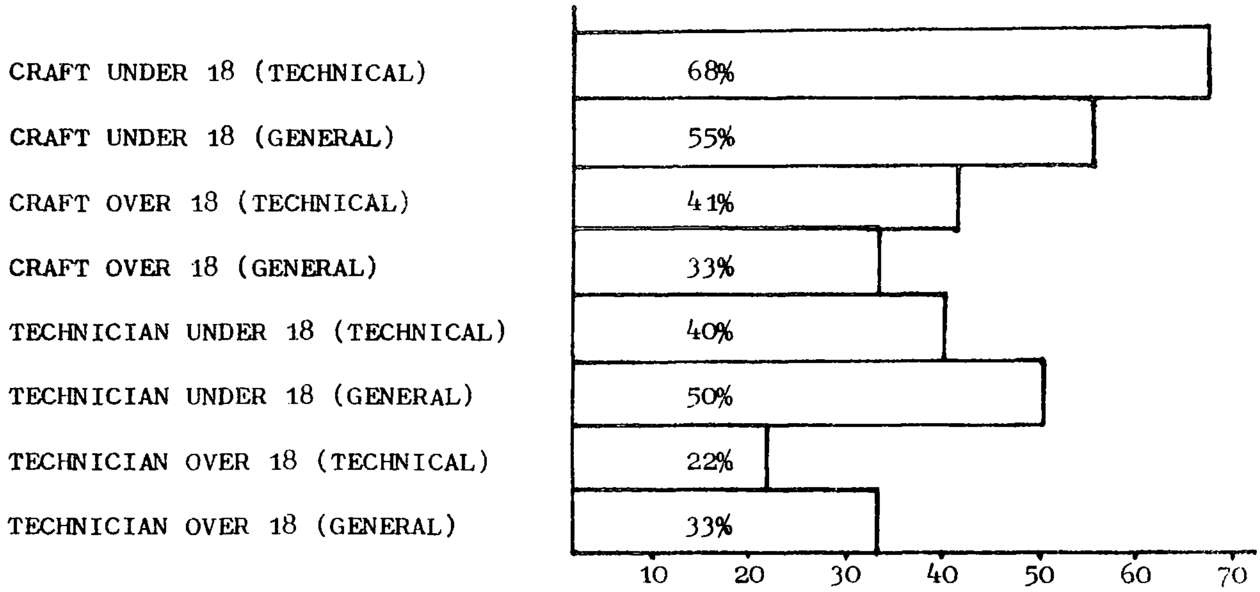


TABLE 8.6.

TABLE SHOWING PERCENTAGES OF STUDENTS CLAIMING NOT TO HAVE READ A SINGLE BOOK IN THE PREVIOUS 12 MONTHS

BOOKS READ BY STUDENTS OVER PREVIOUS 12 MONTHS

It is obvious from the information given that membership of a library does not mean that the student will actually take a book out and read it. It is also possible of course that a student may read books and not be a member of a library.

The total number of books claimed to have been read by each group over a 12 month period is:- craft under 18 students, 104 technical books and 571 general books read for pleasure, indicating an average per student of 1.1 and 6.1 books respectively. The craft over 18 had read 260 technical books and 630 general books given a yearly reading average of 2.8 and 6.7. The technician under 18 had read 288 technical books and 399 general books, this giving a yearly average of 3.1 and 4.2 respectively. The technicians over 18 had read a total of 354 technical books and 810 others indicating a yearly reading average of 3.8 technical books and 8.6 other books.

The yearly reading averages are as follows:-

All craft students 1.9 technical books 6.4 general books

All technician students 3.4 technical books 6.4 general books

From these figures it can be deduced that the only area in which the craft and technician students differ with regard to the number of books read is in the technical sector. The technician student attending the more academic course of the two probably needs to read more technical books to be able to cope with the work required of him, but even taking this into account the amount of books read are extremely low.

Lecturers in their questionnaire were asked to give their opinions concerning students membership of libraries and if they were likely to be members of either college libraries or public libraries. Their replies compared to student claims can be seen in the following:-

TABLE 8.7

	CLAIMS OF STUDENTS		LECTURERS ANTICIPATIONS	
STUDENT GROUP	% MEM. OF COLL. LIB	% MEM OF PUB. LIB	% MEM OF COLL. LIB	% MEM OF PUB. LIB
ALL CRAFT STUDENTS	54	37	9	0
ALL TECHNICIAN STUDENTS	54	36	26	10

Lecturers are of the opinion that students are just not interested in reading books, particularly the craft students. There was not one lecturer who thought that a single craft student would be a member of a public library.

CHAPTER 9

LIFE AT SCHOOL INCLUDING QUALIFICATIONS OBTAINED

1) (3)

In general examination successes at school of all the motor vehicle students left a great deal to be desired, in particular the results obtained by craft students who were particularly poor at both G.C.E. and C.S.E. levels.

Out of all 188 craft students used in this work, a total of 77 students (41%) indicated that they had no C.S.E. subjects at all. The results also show that 164 craft students representing 87% of the whole had not a single pass at any grade of G.C.E.

The results obtained by technician students at school tended to be marginally better. Again 188 technician students took part and out of this number 65 (35%) indicated that they had no C.S.E.'s and a total of 131 (70%) had not a G.C.E. pass.

The age category of the student did not seem to make any difference to the examination success rate as can be seen by the following:-

TABLE 9.1.

STUDENT GROUP	% WITH NO C.S.E. PASSES	% WITH NO G.C.E. PASSES
Craft students under 18 yrs	43	86
Craft students over 18 yrs	39	88
Tech. students under 18 yrs	35	72
Tech. students over 18 yrs	34	63

As can be seen in tables 9.2. and 9.3., the number of passes claimed by the various groups are indicated. Considering craft students, the most successful pass rates for C.S.E.'s were obtained in technical studies and English language. English language scored the highest pass rate at grade 1 followed by technical studies and mathematics.

C.S.E. PASSES

TABLE 9.2. STUDENTS NUMBERED 94 IN EACH GROUP

C.S.E.	CRAFT STUDENTS UNDER 18 YRS				TECHNICIAN STUDENTS UNDER 18 YRS			
	GRADE 1	GRADE 2	GRADE 3	GRADE 4	GRADE 1	GRADE 2	GRADE 3	GRADE 4
MATHEMATICS	6	7	19	11	11	13	24	10
SCIENCE	2	6	18	6	8	18	9	12
TECHNICAL STUDIES	2	20	24	7	12	19	17	5
CHEMISTRY	1	3	1	4	3	6	9	4
BIOLOGY	1	2	4	1	2	5	7	3
ENGINEERING DRAWING	4	8	6	6	10	5	12	5
GEOGRAPHY	4	4	13	5	2	14	9	5
ENGLISH LANGUAGE	5	8	20	6	6	18	18	5
HISTORY	2	6	5	8	7	9	10	3
ENGLISH LITERATURE	3	6	19	5	4	16	18	5

TABLE 9.2. CONTINUED

C.S.E.	CRAFT STUDENTS OVER 18 YRS				TECHNICIAN STUDENTS OVER 18 YRS			
	GRADE 1	GRADE 2	GRADE 3	GRADE 4	GRADE 1	GRADE 2	GRADE 3	GRADE 4
MATHEMATICS	5	9	24	7	9	17	23	1
SCIENCE	7	13	20	5	11	19	18	2
TECHNICAL STUDIES	9	19	16	4	15	21	13	1
CHEMISTRY	3	1	6	4	3	3	8	2
BIOLOGY	0	1	1	0	1	6	10	2
ENGINEERING DRAWING	3	14	6	1	13	12	10	3
GEOGRAPHY	2	9	10	1	4	11	13	2
HISTORY	3	8	11	3	5	13	10	1
ENLISH LANGUAGE	9	14	16	7	11	17	18	6
ENGLISH LITERATURE	4	11	16	6	10	15	18	4

G.C.E. PASSES

TABLE 9.3.

G.C.E.	CRAFT STUDENTS OVER 18 YRS			TECHNICIAN STUDENTS OVER 18 YRS		
	GRADE A	GRADE B	GRADE C	GRADE A	GRADE B	GRADE C
MATHEMATICS	0	1	3	2	6	8
SCIENCE	0	3	2	0	4	7
TECHNICAL STUDIES	1	5	5	1	13	6
CHEMISTRY	0	0	0	0	1	1
BIOLOGY	0	1	0	0	2	0
ENGINEERING DRAWING	0	1	2	0	7	4
GEOGRAPHY	1	0	1	1	6	3
HISTORY	0	1	0	1	1	3
ENGLISH LANGUAGE	0	1	4	0	4	6
ENGLISH LITERATURE	0	0	0	0	5	4

TABLE 9.3

G.C.E.	CRAFT STUDENTS UNDER 18 YRS			TECHNICIAN STUDENTS UNDER 18 YRS		
	GRADE A	GRADE B	GRADE C	GRADE A	GRADE B	GRADE C
MATHEMATICS	0	0	3	1	4	5
SCIENCE	0	1	1	0	2	4
TECHNICAL STUDIES	1	1	2	1	4	4
CHEMISTRY	1	0	0	0	0	2
BIOLOGY	0	0	3	0	0	1
ENGINEERING DRAWING	1	0	0	0	2	4
GEOGRAPHY	0	2	1	0	2	3
HISTORY	1	1	3	0	0	2
ENGLISH LANGUAGE	0	3	3	2	4	6
ENGLISH LITERATURE	0	2	2	1	3	5

Overall the most successful pass rates for technician students at the C.S.E. level were achieved in mathematics, technical studies and English language. Technical studies had the highest number of grade 1 passes followed by engineering drawing.

On average the highest pass rates for both craft and technician groups were achieved at the grade 2 and 3 levels.

TABLE 9.4. C.S.E. PASSES

LISTED CSE SUBJECTS	% OF CRAFT STUDENTS WITH A 1-4 PASSES	% OF TECHNICIAN STUDENTS WITH A 1-4 PASSES
Mathematics	41	57
Science	41	52
Technical Studies	54	55
Chemistry	12	20
Biology	5	16
Engineering Drawing	26	37
Geography	26	32
History	24	31
English Language	45	53
English Literature	37	48

G.C.E. results were, as expected, very low, there being only 64 passes at levels A - C out of 188 craft students. The 188 technician students achieved 158 passes at the same levels.

As in the case of the C.S.E. passes, the subjects of technical studies and English language proved to have the highest pass rates for the craft students. Technician students achieved their highest pass rates with the subjects of technical studies and mathematics.

TABLE 9.5. G.C.E. PASSES

LISTED G.C.E. SUBJECTS	% OF CRAFT STUDENTS WITH A - C PASSES	% OF TECHNICIAN STUDENTS WITH A - C PASSES
Mathematics	4	14
Science	4	9
Technical Studies	7	15
Chemistry	0.5	2
Biology	2	1.6
Engineering Drawing	2	9
Geography	3	8
History	3	4
English Language	6	12
English Literature	2	10

It can be seen from the general picture of examination results that attainment at school for the average motor vehicle apprentice is low, indicating that the young people attracted to or recruited into the motor industry are very much from the lower to lower middle streams of the schools.

2) (4)

The responses from all groups concerning examination failure indicated a certain reluctance to give full information regarding this matter, many students indicating that they had not failed any examination at all or that they had not actually sat any examinations at all.

TABLE 9.6. lists subjects failed by students. The craft students identified C.S.E. mathematics, English language and biology and G.C.E. English literature as the subjects in which they had the most failures. The subjects in which the technician students had the most failures were G.C.E. history, mathematics, geography, English language and English literature.

There were only two technicians who said that they had failed

C.S.E. mathematics corresponding with 9 who said they had failed G.C.E. mathematics. There was only 1 student out of all groups who indicated that he had failed the subject of science at the G.C.E. level, no-one said that they had failed C.S.E. science.

As expected, it appears from these results that fewer craft students took G.C.E. subjects.

EXAMINATIONS FAILED

TABLE 9.6.

SUBJECT	NUMBER OF FAILURES LISTED PER SUBJECT			
C.S.E.	CRAFT UNDER 18	CRAFT OVER 18	TECHNICIAN UNDER 18	TECHNICIAN OVER 18
MATHEMATICS	8	4	1	1
SCIENCE	-	-	-	-
TECHNICAL STUDIES	-	-	-	-
CHEMISTRY	3	-	1	1
BIOLOGY	1	4	1	-
ENG/TECH DRAWING	2	-	-	-
GEOGRAPHY	2	-	1	-
HISTORY	2	-	2	2
ENGLISH LANGUAGE	-	5	-	1
ENGLISH LITERATURE	1	-	1	-
REL. EDUCATION	1	-	1	1
PHYSICS	3	-	-	-
ART	1	2	-	-
COMPUTER STUDIES	-	-	-	1
FRENCH	-	1	1	-
G.C.E.				
MATHEMATICS	-	2	3	6
SCIENCE	-	-	-	1
TECHNICAL STUDIES	1	-	-	-
CHEMISTRY	1	1	2	1
BIOLOGY	-	1	-	1
ENGINEERING DRAWING	-	2	3	-
GEOGRAPHY	-	-	3	5
HISTORY	1	1	3	7
ENGLISH LANGUAGE	-	2	2	3
ENGLISH LITERATURE	1	3	3	3
GERMAN	1	-	-	-
FRENCH	-	-	1	1
ART	1	1	-	-
PHYSICS	1	1	1	1
LATIN	1	-	-	-
MUSIC	-	-	1	-
METALWORK	1	-	-	-

3) (38)

The subjects that students said they enjoyed at Secondary school were remarkably similar for all groups of students. To illustrate this fact, the five most enjoyed subjects for each of the groups of students have been extracted from table 9.8., the subject in each case being followed by the percentage of the group members listing that particular subject.

CRAFT STUDENTS UNDER 18	
Metalwork	30%
English	19%
Physical Education	16%
Woodwork	14%
Art	5%

CRAFT STUDENTS OVER 18	
Metalwork	30%
Woodwork	22%
English	21%
Physical Education	19%
Geography Technical Drawing	18%

TECHNICIAN STUDENTS UNDER 18	
Metalwork	32%
Woodwork	22%
Technical Drawing Physical Education	18%
Mathematics	16%
Physics Geography	13%

TECHNICIAN STUDENTS OVER 18	
Metalwork	28%
Technical Drawing	20%
Mathematics	17%
Woodwork History	16%
Physical Education	15%

The first choice in all cases was the subject of 'metalwork'. All groups also listed in their 'top five', the subjects of 'physical education' and 'woodwork'. Common to the technician groups only were the subjects of 'mathematics' and 'technical drawing'. It is interesting to see that, unlike the craft groups, the technicians did not list 'English' in their five most enjoyed subjects.

4) (39)

It is pleasing to see that, on the whole, students enjoyed their years in Secondary school. Sixty-nine per cent of all craft students saying they enjoyed school, compared with 72% of the technicians who said they enjoyed Secondary school.

TABLE 9.7.

STUDENT GROUP	PERCENTAGE ENJOYING SECONDARY SCHOOL
Craft students under 18	61%
Craft students over 18	77%
Technician students under 18	68%
Technician students over 18	76%

5) (40)

The reasons for liking or disliking Secondary school are fully listed in table 9.9., but the three most significant reasons in each case for each group have been extracted.

1) REASONS FOR LIKING SECONDARY SCHOOL

CRAFT STUDENTS UNDER 18 YEARS OF AGE N = 57

(a) Had a good time (28%)

(b) Had good friends (21%)

(c) Enjoyed lessons (11%)

CRAFT STUDENTS OVER 18 YEARS OF AGE N = 72

(a) Had a good time (31%)

(b) Had good friends (31%)

(c) Enjoyed lessons (8%)

SUBJECTS PARTICULARLY ENJOYED AT SECONDARY SCHOOL

TABLE 9.8.

SUBJECTS ENJOYED	CRAFT STUDENTS UNDER 18	CRAFT STUDENTS OVER 18	TECHNICIAN STUDENTS UNDER 18	TECHNICIAN STUDENTS OVER 18
Physics	5	8	12	12
P.E.	15	18	17	14
Metalwork	28	28	30	26
English	18	20	8	3
Geology	-	1	-	1
Science	4	9	2	6
Woodwork	13	21	21	15
Mathematics	11	10	15	16
History	9	12	8	15
Chemistry	2	2	3	8
Biology	10	6	7	7
Geography	8	17	12	10
Technical Drawing	9	17	17	19
Art	12	12	9	8
Latin	1	-	-	-
French	3	3	1	-
Cookery	1	-	-	1
Music	2	3	1	2
German	1	-	-	-
Sociology	-	1	-	-
Needlework	-	1	-	-
R.E.	-	3	-	1

TECHNICIAN STUDENTS UNDER 18 YEARS OF AGE N = 64

(a) Had good friends (30%)

(b) Enjoyed the sport (14%)

(c) Had a good time / Good teachers (9%)

TECHNICIAN STUDENTS OVER 18 YEARS OF AGE N = 71

(a) Had good friends (27%)

(b) Had a good time (20%)

(c) Enjoyed the sport (11%)

REASONS FOR DISLIKING SECONDARY SCHOOL (MAIN THREE)

CRAFT UNDER 18 YEARS OF AGE N = 37

(a) Didn't like teachers (43%)

(b) Didn't like lessons (38%)

(c) Didn't like discipline (22%)

CRAFT STUDENTS OVER 18 YEARS OF AGE N = 22

(a) Didn't like teachers (91%)

(b) Didn't like lessons (27%)

(c) Didn't like discipline (23%)

TECHNICIAN STUDENTS UNDER 18 YEARS OF AGE N = 30

(a) Didn't like teachers (67%)

(b) Didn't like lessons (33%)

(c) Didn't like discipline (33%)

TECHNICIAN STUDENTS OVER 18 YEARS OF AGE N = 23

(a) Didn't like teachers (96%)

(b) Didn't like discipline (48%)

(c) Didn't like lessons (43%)

Of the reasons given for liking Secondary school, the reasons common to all groups are (a) had a good time and (b) had good friends.

The reason common to craft students but not listed in the main reasons by technicians is the enjoyment of lessons. High on the technician list but not mentioned by craft students is the enjoyment of sport.

Concerning the reasons given for disliking Secondary school, it is strange to see that in all cases the student groups listed the same three reasons. By far the most outstanding reason for disliking school was the dislike of teachers.

6) (41-42)

WAYS IN WHICH TEACHERS AT SECONDARY SCHOOL HELPED STUDENTS

Table 9.10. shows that the most outstanding way in which students received help from teachers in Secondary school was 'help in lessons' followed at some distance by 'help generally' and 'help with personal problems'.

MAIN REASONS FOR LIKING OR DISLIKING SECONDARY SCHOOL

TABLE 9.9. N = 94

REASONS FOR: LIKING	CRAFT STUDENTS UNDER 18 YEARS	CRAFT STUDENTS OVER 18 YEARS	TECHNICIAN STUDENTS UNDER 18 YEARS	TECHNICIAN STUDENTS OVER 18 YEARS
GIRLS	4	3	5	5
LESSONS	6	6	4	4
FRIENDS	12	22	19	19
GOOD TIME	16	22	6	14
SPORT	3	3	9	8
TEACHERS	5	1	6	3
HOLIDAYS	3	4	5	8
DISLIKING				
TEACHERS	16	19	20	22
LESSONS	14	6	10	10
UNIFORM	1	4	5	1
BORING	6	3	3	3
DISCIPLINE	8	5	10	11
HOMEWORK	3	3	6	1
PUNISHMENT	1	3	-	3
MEALS	-	-	3	1
NO SMOKING	-	-	3	-

The table also shows that a large percentage of students considered that no individual teachers stood out as being particularly helpful in any way, an average of 53% of all the students taking this attitude.

TABLE 9.10

CATEGORY OF HELP	PERCENTAGE RECEIVING HELP			
	CRAFT UNDER 18 YEARS	CRAFT OVER 18 YEARS	TECH. UNDER 18 YEARS	TECH. OVER 18 YEARS
Help with lessons	24%	21%	21%	21%
Help generally	9%	5%	5%	15%
Personal problems	4%	3%	16%	6%
In getting a job	6%	4%	5%	7%
No help indicated	53%	62%	50%	46%

7) (47)

Students, when summing up the impression they had of their Secondary school teachers, produced statements that at times were quite colourful and at other times quite flattering. It was decided to express the opinions of the students as finding their teachers satisfactory or unsatisfactory.

All groups had a certain consistency in that, of all the craft students, 52% thought that in general their teachers at Secondary school were satisfactory, compared with 54% of technician students who thought the same.

8) (48)

The students who had the opportunity to stay on at school but left gave their reasons for leaving as:-

REASON	% OF LEAVERS SAYING THIS
(a) Wanted a job	32%

REASON	% OF LEAVERS SAYING THIS
(b) Did not like school	28%
(c) Wanted money	18%
(d) Had a job to go to	15%
(e) Thought they were wasting their time at school	7%

All groups, regardless of age, showed consistency in the scores obtained for their reason for leaving, the most important reason given being that they wanted to leave to get a job and earn their living. Also high in the list of reasons for wanting to leave school was the suggestion that they did not like school and were keen to leave.

INTERVIEWS WITH CAREERS OFFICERS

There was a significantly high number of students interviewed by careers officers before they left school, the percentage of those students claiming to have been interviewed at this time being:- all craft student, 89%, all technician students 91%.

The number of students who had follow-up interviews after they had left school was considerably less, there being 30% of craft students and 31% of technician students receiving such an interview.

STUDENTS SATISFACTION WITH TEACHERS AT SECONDARY SCHOOL

TABLE 9.11.

STUDENT GROUPS	SATISFACTORY	UNSATISFACTORY
Craft students under 18 years	51	19
Craft students over 18 years	46	37
Technician students under 18 years	45	37
Technician students over 18 years	57	13

REASONS FOR LEAVING SCHOOL AND INTERVIEWS WITH CAREERS OFFICERS

TABLE 9.12. N = 94

REASON FOR LEAVING	CRAFT STUDENTS UNDER 18 YEARS		CRAFT STUDENTS OVER 18 YEARS		TECH STUDENTS UNDER 18 YEARS		TECH STUDENTS OVER 18 YEARS	
Didn't like school	7		8		9		6	
Wanted a job	10		8		6		11	
Had a job	4		4		3		5	
Wanted money	4		3		7		5	
Waste of time	-		3		4		1	
Interviewed by Careers Officer before leaving school	YES	NO	YES	NO	YES	NO	YES	NO
	84	10	84	10	91	3	81	13
Interviewed by Careers Officer after leaving school	YES	NO	YES	NO	YES	NO	YES	NO
	34	60	23	71	32	62	26	68

9) (49)

The results from the questionnaire concerning the amount of advice schools gave to students with regard to leaving or staying on at school, getting a job or the type of job best suited was, from the students point of view, very low indeed.

The students responded by writing statements on the advice they had received such as 'stay on and get more qualifications', 'leave and try to get a job', 'leave and get a trade', or more commonly the student indicated that he received no advice at all on this matter.

For the purpose of categorising, the various statements from the students were grouped into three areas:-

(a) specific advice; (b) general advice; (c) no advice.

The results obtained can be seen in table 9.14, the most significantly outstanding feature of these results being the apparent lack of any type of advice given to students by their schools.

10) (50)

ADVICE GIVEN BY PARENTS REGARDING STAYING ON OR LEAVING SCHOOL

TABLE 9.13

	PERCENTAGES RECEIVING ADVICE			
ADVICE GIVEN BY PARENTS	CRAFT UNDER 18 YRS	CRAFT OVER 18 YRS	TECH. UNDER 18 YRS	TECH. OVER 18 YRS
LEAVE	32%	28%	24%	26%
STAY ON	4%	5%	11%	7%
DECISION LEFT TO STUDENTS	64%	67%	65%	67%

The advice parents gave their sons concerning leaving or staying on at school was found again to be, on average, at a low level. The most positive advice given by parents appeared in the form of advice to leave school. This type of advice was given by 30% of parents to their children now on craft courses and 25% of parents of students now on technician courses gave the same advice to leave school.

Only 4.5% of all the craft students received advice from parents to stay on at school as opposed to 9% of the technician students.

In contrast to these low figures, 65.6% of craft students were told by parents that it was 'up to them' if they left or stayed on at school. Sixty-six per cent of technician students were also told it was 'up to them' if they left or stayed on at school.

11) (51)

When the student had actually left school and was attending a college course, 86% of parents were credited by students with giving them encouragement to do well at college. 324 students said they received encouragement and 52 students said they received no encouragement to do well at school.

ADVICE GIVEN TO STUDENTS AT SCHOOL

TABLE 9.14

N = 94

ADVICE SCHOOL GAVE CONCERNING	CRAFT STUDENTS UNDER 18 YEARS	CRAFT STUDENTS OVER 18 YEARS	TECHNICIAN STUDENTS UNDER 18 YEARS	TECHNICIAN STUDENTS OVER 18 YEARS
LEAVING/STAYING ON AT SCHOOL:-				
SPECIFIC	12%	19%	16%	22%
GENERAL	4%	5%	12%	3%
NONE	84%	76%	72%	74%
GETTING A JOB				
SPECIFIC	17%	20%	26%	14%
GENERAL	9%	23%	13%	19%
NONE	74%	56%	62%	67%
JOB BEST SUITED TO STUDENT				
SPECIFIC	12%	14%	19%	18%
GENERAL	4%	9%	12%	7%
NONE	84%	78%	69%	74%

CHAPTER 10

OPINIONS AND ATTITUDES OF STUDENTS ATTENDING COLLEGE

10.1 LIFE AT COLLEGE

The replies requested from both students and lecturers in this section were in the form of opinions on a five point scale. The general comments on responses are based on the mean and standard deviation calculated on the basis of individual group scores. Lecturers were asked to anticipate the opinions and attitudes of students and, as reported in Part 3, the lecturers' responses in general do not indicate that they differentiate between craft and technician students. Where 'significant' differences do occur, the particular question is marked with an asterisk and the variations in responses reported in the text.

The first number in brackets is the number of the question as it appears in the student questionnaire, the second bracketed number is the corresponding lecturers' question number as it appears in the lecturers' questionnaire.

INTERPRETATION OF RESPONSES

In the charts indicating group responses, the figures can be interpreted as follows:-

THE MEAN

A MEAN OF 1 indicates strong agreement with the statement

A MEAN OF 2 indicates agreement with the statement

A MEAN OF 3 indicates a neutral opinion

A MEAN OF 4 indicates disagreement with the statement

A MEAN OF 5 indicates strong disagreement with the statement.

STANDARD DEVIATION

The maximum standard deviation on a five point scale is 2, and, in translating the figures as they appear in the charts, the following guide can be used:-

- indicates a poor level of agreement (1.2 or over)

+ indicates a low level of agreement (1.1 - 1.2)

++ indicates a moderate level of agreement (1.0-1.1)

+++ indicates a high level of agreement (under 1.0)

1) (72)(25) *

The nearest to agreeing with the statement that 'in order to succeed at college and pass examinations, students must read text books' was the technician group under 18 years of age with a mean of 2.329. The rest of the student groups, including the lecturers when anticipating technician students (MEAN 2.828), had a tendency to be neutral in their responses. Surprisingly, the lecturers thought that craft students would disagree with the statement.

The general level of agreement for both craft groups was poor, the technician over 18 group and the lecturers' craft responses producing a low level of agreement whilst the technician group under 18 and the lecturers when responding for technician students had a moderate level of agreement, the lecturers producing a S.D. of 1.081.

2) (73)(26)

Lecturers are of the opinion that part time students tend to think that they miss out on college activities. This proved to be true of all student groups as they returned an average mean of 2.210. The only group with a reasonable level of agreement on this point was the technician students over 18 years with a standard deviation of 1.085.

3) (74)(27)

Both craft groups and technician students under 18 tended to agree on average, that students should be given the opportunity to participate in administrating student facilities. Although the general tendency was for students to have some uncertainty in their replies, the most neutral responses came from the technician students over 18. Lecturers themselves thought that all students would be uncertain on this matter and answer with neutrality. The groups which were more definite were the two younger groups of students.

4) (85)(38)

When students were asked to resond to the statement 'my college is usually fair but tough with students' their responses produced a high level of agreement with the lecturers anticipations of their replies, that is with a heavy concentration in the middle neutral position, students being very undecided on this point.

5) (92)(45)

Only the craft students under 18 thought that their academic needs were catered for at college. The remaining three groups of students, although answering positively, were only just left of centre, as indeed the lecturers thought they would be. All groups achieved quite a high level of agreement, there being a heavy response in and around the number three neutrality box.

6) (94)(47)

The friends and acquaintances of craft under 18 students are, according to the students themselves, marginally impressed when they are told of the student attending college. This is not the case with the other three groups of students. The general impression is that friends and acquaintances are marginally unimpressed by the fact that they attend college, this being the view that lecturers thought that students would have.

7) (95)(48)

On the question as to whether the college and staff should take an interest in students problems, both inside and outside the college, only the craft under 18 group tended to agree that they should. The remaining three groups gave a neutral opinion on this matter with a moderate level of agreement (as the lecturers thought they would).

8) (98)(51)

To the statement 'the college sometimes interferes with my personal life' all students replied with uncertainty. The lecturers thought that students would have answered more positively and said they believed that the college does interfere with their personal lives.

9) (99)(52)

Lecturers thought that students would not know one way or the other if the library facilities at their colleges were perfectly adequate. Students thought, to a low level, that library facilities were adequate at college.

10) (103)(56)

Technician students under 18 years of age agreed to a reasonable level that they were encouraged to work together at college. As anticipated by the lecturers, the remaining groups of students, to various levels of agreement, tended not to express an opinion.

11) (104)(57)

In reply to the statement 'a day at college is more enjoyable than going to work' all groups had low levels of agreement. The craft under 18 group answered with neutrality, the remaining groups saying, as the lecturers thought they would, that they would prefer to go to work than attend college.

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	72	25	21	2.659	1.425	-
CRAFT OVER 18				2.882	1.319	-
TECH UNDER 18				2.329	1.075	++
TECH OVER 18				2.553	1.190	+
LECTURERS *				3.608	1.112	+
CRAFT UNDER 18	73	26	22	2.244	1.285	-
CRAFT OVER 18				2.223	1.230	-
TECH UNDER 18				2.319	1.213	-
TECH OVER 18				2.053	1.085	++
LECTURERS				2.270	1.368	-
CRAFT UNDER 18	74	27	23	2.265	1.053	++
CRAFT OVER 18				2.510	1.286	-
TECH UNDER 18				2.478	1.049	++
TECH OVER 18				2.808	1.151	+
LECTURERS				3.040	1.278	-

TABLE 10.1.

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	85	38	34	2.627	1.020	++
CRAFT OVER 18				3.053	1.014	++
TECH UNDER 18				2.808	0.959	+++
TECH OVER 18				3.010	0.881	+++
LECTURERS				3.054	0.928	+++
CRAFT UNDER 18	92	45	41	2.244	1.048	++
CRAFT OVER 18				2.723	0.927	+++
TECH UNDER 18				2.585	0.938	+++
TECH OVER 18				2.542	0.963	+++
LECTURERS				2.662	0.976	+++
CRAFT UNDER 18	94	47	43	2.489	0.931	+++
CRAFT OVER 18				3.361	1.099	++
TECH UNDER 18				3.117	1.090	+++
TECH OVER 18				3.074	1.044	++
LECTURERS				3.094	1.117	+

TABLE 10.1 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	95	48	44	2.287	1.190	+
CRAFT OVER 18				3.234	1.232	-
TECH UNDER 18				3	1.061	++
TECH OVER 18				2.765	1.066	++
LECTURERS				2.837	1.053	++
CRAFT UNDER 18	98	51	47	2.861	1.418	-
CRAFT OVER 18				2.914	1.506	-
TECH UNDER 18				3.212	1.450	-
TECH OVER 18				2.691	1.384	-
LECTURERS				2.459	1.254	-
CRAFT UNDER 18	99	52	48	2.308	1.111	+
CRAFT OVER 18				2.159	1.064	++
TECH UNDER 18				2.468	1.191	+
TECH OVER 18				2.202	1.057	++
LECTURERS				2.810	1.204	-

TABLE 10.1 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	103	56	52	2.670	1.215	-
CRAFT OVER 18				2.755	1.191	+
TECH UNDER 18				2.393	1.064	++
TECH OVER 18				2.723	1.085	++
LECTURERS				2.851	0.925	+++
CRAFT UNDER 18	104	57	53	2.946	1.257	-
CRAFT OVER 18				3.340	1.357	-
TECH UNDER 18				3.5	1.302	-
TECH OVER 18				3.297	1.319	-
LECTURERS				3.432	1.208	-
CRAFT UNDER 18						
CRAFT OVER 18						
TECH UNDER 18						
TECH OVER 18						
LECTURERS						

TABLE 10.1 CONTINUED

10.2 LECTURERS AT COLLEGE

1) (75)(28)

The only group whose response was approaching the neutral position in reply to the statement 'lecturers in technical colleges need to have good academic qualifications' was the craft under 18 group, all the others agreeing quite strongly with the statement. Lecturers, although on average anticipating the students responses, had the lowest level of agreement achieving a standard deviation of 1.204.

2) (76)(29)

All groups, including the lecturers, responded very positively, and to a high level of agreement that lecturers in technical colleges need to be good practically in order to teach technical subjects effectively.

3) (77)(30)

Students agreed to a comparatively low level that, generally speaking, lecturers in their technical college treat them with respect. Lecturers were not able to express an accurate opinion on this matter as they anticipated that students would tend to be uncertain in reply with a tendency to answer by putting their tick in the neutral box.

4) (78)(31)

All groups on average (a slightly positive response coming from the craft under 18 students) had a tendency to disagree with the statement that 'a good college lecturer always keeps his students quiet in class'. Lecturers themselves voiced the same opinion, agreeing to a low level that students would reply as they did.

5) (80)(33)

Lecturers anticipated students' replies to the statement that 'all lecturers in technical colleges should be trained to teach' by indicating that students would agree to a high level with the statement.

The only group with a low level of agreement in their replies were the craft students under 18.

6) (82)(35)

When asked if college lecturers who swear in class are generally poor lecturers, the only groups left of centre on average were the craft under 18 students. The remaining three groups thought to a greater extent than lecturers anticipated that swearing in class does not necessarily indicate a poor lecturer.

7) (84)(37)

Lecturers did not think that students would react as positively as they did to the statement that 'most college lecturers I know are enthusiastic and seem to enjoy their work'. The students on average were just left of centre with moderate levels of agreement on the five point scale, an exception to this being the craft under 18 group who had a low level of agreement in their choice on the opinion scale.

8) (86)(39)

On the question of lecturers at college enforcing discipline, students, as predicted by lecturers, answered with a reasonable amount of agreement, in the neutral position.

9) (89)(42)

The highest mean and standard deviation calculated from responses came from the lecturers when asked if they considered, generally speaking that students thought that a friendly atmosphere exists between lecturers and students at their college. Students responded more positively than expected by lecturers, and agreed to a moderately high level that a friendly atmosphere does exist between them and lecturers.

10) (90)(43)

Students agreed to the level expected of them that opinions given by lecturers concerning course matters were generally good ones. The only group not to have a high level of agreement on the opinion scale was the craft students under 18, who returned a mean of 2.202 and a standard deviation of 1.199.

11) (91)(44)

Generally speaking, students could not decide with any certainty whether college lecturers would help them if they found themselves in difficulties, either at work or at home. Again the craft students under 18 agree to a low level that perhaps they would receive help from lecturers in this way. Lecturers went along with the main body of students and answered their statement with a mean just left of centre, but showing the highest agreement on the five point scale with a standard deviation of 0.923.

12) (97)(50)

To the statement 'enthusiastic college lecturers make students enthusiastic', all groups answered with agreement to a comparatively low level that this was the case, students responses being consistent with those expected of them by the lecturers.

13) (107)(60)

Students could not make up their minds as to whether college lecturers are generally sympathetic to their study problems. Lecturers in similarity with the students, had a high level of agreement in their replies there being a high concentration of individual responses in the neutral position.

14) (108)(61)

There was general agreement amongst all the groups of students that the principal aim of college lecturers is to bring about improved standards of skill in their students. Lecturers did not expect the students to be as positive as they were, returning the highest mean of 2.513 and also having the lowest level of agreement, with a standard deviation of 1.117.

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	75	28	24	2.563	1.190	+
CRAFT OVER 18				1.957	1.071	++
TECH UNDER 18				1.861	1.057	++
TECH OVER 18				1.882	1.090	++
LECTURERS				2.189	1.204	-
CRAFT UNDER 18	76	29	25	2.159	0.981	+++
CRAFT OVER 18				1.595	0.891	+++
TECH UNDER 18				1.542	0.820	+++
TECH OVER 18				1.478	0.695	+++
LECTURERS				1.337	0.552	+++
CRAFT UNDER 18	77	30	26	2.404	1.055	++
CRAFT OVER 18				2.574	1.224	-
TECH UNDER 18				2.265	1.053	++
TECH OVER 18				2.489	1.218	-
LECTURERS				3.054	1.149	+

TABLE 10.2

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	78	31	27	2.776	1.204	-
CRAFT OVER 18				3.414	1.188	+
TECH UNDER 18				3.297	1.089	++
TECH OVER 18				3.191	1.187	+
LECTURERS				3.202	1.196	+
CRAFT UNDER 18	80	33	29	2.106	1.258	-
CRAFT OVER 18				1.680	0.865	+++
TECH UNDER 18				1.691	0.875	+++
TECH OVER 18				1.574	0.764	+++
LECTURERS				2	0.929	+++
CRAFT UNDER 18	82	35	31	2.861	1.700	-
CRAFT OVER 18				4	1.139	+
TECH UNDER 18				3.840	1.298	-
TECH OVER 18				3.723	1.223	-
LECTURERS				3.215	1.188	+

TABLE 10.2 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	84	37	33	2.393	1.290	-
CRAFT OVER 18				2.489	1.136	+
TECH UNDER 18				2.287	1.027	++
TECH OVER 18				2.404	0.981	+++
LECTURERS				2.675	0.902	+++
CRAFT UNDER 18	86	39	35	2.702	1.109	+
CRAFT OVER 18				3.095	1.052	++
TECH UNDER 18				2.808	1.054	++
TECH OVER 18				2.882	0.965	+++
LECTURERS				2.905	1.041	++
CRAFT UNDER 18	89	42	35	2.297	1.008	++
CRAFT OVER 18				2.180	1.031	++
TECH UNDER 18				1.819	0.836	+++
TECH OVER 18				2	1.051	++
LECTURERS				2.405	1.101	+

TABLE 10.2 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	90	43	39	2.202	1.199	+
CRAFT OVER 18				2.393	0.925	+++
TECH UNDER 18				2.063	0.782	+++
TECH OVER 18				2.159	0.902	+++
LECTURERS				2.324	0.871	+++
CRAFT UNDER 18	91	44	40	2.393	1.322	-
CRAFT OVER 18				2.893	1.171	+
TECH UNDER 18				2.851	1.010	++
TECH OVER 18				2.648	1.117	+
LECTURERS				2.635	0.923	+++
CRAFT UNDER 18	97	50	46	2.212	1.090	++
CRAFT OVER 18				2.255	1.166	+
TECH UNDER 18				2.223	1.073	++
TECH OVER 18				2.372	1.148	+
LECTURERS				2.310	1.064	++

TABLE 10.2 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	107	60	56	2.553	1.027	++
CRAFT OVER 18				3.159	1.013	++
TECH UNDER 18				2.989	0.939	+++
TECH OVER 18				3.223	0.958	+++
LECTURERS				3	0.944	+++
CRAFT UNDER 18	108	61	57	2.255	0.977	+++
CRAFT OVER 18				2.234	1.095	++
TECH UNDER 18				1.968	0.750	+++
TECH OVER 18				2.202	0.973	+++
LECTURERS				2.513	1.117	+
CRAFT UNDER 18						
CRAFT OVER 18						
TECH UNDER 18						
TECH OVER 18						
LECTURERS						

TABLE 10.2 CONTINUED

10.3 COURSES AND LECTURING METHODS

1) (79)(32)

All student groups reacted very much as lecturers predicted and quite strongly agreed that, when at college, they should be encouraged to speak out in class if they do not understand something said by the lecturer. All groups had a high level of agreement in their responses except the craft under 18 students who, although scoring a low mean of 1.776, had a standard deviation of 1.112.

2) (81)(34)

In response to the statement 'practical demonstrations by the college lecturere are essential when teaching motor vehicle subjects', again the craft under 18 group had a low mean but a high standard deviation. All the other groups reacted very much as the lecturers thought they would and strongly agreed to a high level with the statement.

3) (83)(36)

All groups of students, as predicted by lecturers, were undecided as to whether or not lecturers who stray away from the main subject area and talk about hobbies, sport and other peripheral subjects are wasting the students' time. All groups had a comparatively wide range of scores to this statement.

4) (87)(40)

The craft students under 18, and both technician groups generally thought to a reasonable level of agreement that the college courses they wereattending were effectively organised. The craft group over 18 was the only group whose responses approached those expected by the lecturers, which was to reply with neutrality.

5) (88)(41)

All groups, to a generally low level of agreement, answered as lecturers thought they would, which was with uncertainty when asked if it is important that lessons at college start and finish on time.

6) (93)(46)

To the statement 'the academic content of my course is, in my opinion, perfectly adequate', students' general score was approximately half way between 'agreement' with the statement and neutrality. The lecturers were of the opinion that students on average would reply with more neutrality than they did. All groups had a high general level of agreement.

7) (100)(53)

The technician students under 18 years of age came the nearest to 'agreeing' that the lessons they had attended at college were generally well presented by the lecturers. The remaining groups fell roughly in line with lecturers' expectations and answered just left of centre, giving the general opinion that lesson presentation by lecturers was probably satisfactory.

8) (101)(54)

All groups tended to lean towards the centre, including the lecturers who replied nearest the neutral position thinking that students would not know whether or not lessons at college make them develop new ideas of their own, which was proved to be the general case.

9) (102)(55)*

Lecturers to a high level of agreement felt that craft students at the end of the day at college go away not knowing if they had learnt something or not. Students' responses indicated a slightly more positive reply but generally went along with lecturers' opinions. Students level of agreement in their replies ranged from poor to reasonably good. Lecturers thought that technician students would reply positively and generally agree that they did learn something from their day at technical college.

10) (105)(58)

Lecturers again anticipated students opinions, and indicated that students in reply to the statement 'at college good use is made by the lecturers of visual aid materials and equipment', would on average be neutral. The strongest disagreement with this statement came from the craft students over 18 who returned a mean of 3.223.

11) (106)(59)

Technicians over 18 years of age thought that the advantages of being successful on their course had been adequately explained to them. Agreeing to this to a lesser extent were the groups, craft over 18 and technician under 18. Lecturers thought that students would have a tendency to be neutral on this matter, as indeed the craft under 18 groups were. This group of craft under 18 showed, unlike all other groups, a low level of opinion agreement.

12) (109)(62)

To the statement 'it is important that students should be given a statement at the beginning of a teaching programme indicating the topics that are to be taught and the reasons why they have been included', the craft students under 18 answered as the lecturers expected, that is with a learning towards neutrality. This was not the case with the remaining three groups of students, who thought that they should receive such a statement. All groups had high levels of agreement.

13) (110)(63)

All groups of students except the craft under 18 agreed to a high level that they think it is important that the lecturer teaches the related topics of the syllabus in a clear and natural order. Lecturers themselves anticipated the responses from the main body of students to this statement.

14) (111)(64)

Craft students over 18 and technician students over 18 agreed to a moderate level that they think it important that they know the previous year's examination results of the course they are attending. To a lesser level of agreement the two younger groups of students reacted more in line with the lecturers' expectations, opinions on average being just left of centre.

15) (112)(65)

Lecturers' ideas on students reactions to the statement on how important it was to them to be given 'progress bulletins' on their performance as students, fell in line with those responses given by the craft under 18 group, which showed a certain amount of uncertainty. The remaining groups of students thought it was a good idea and agreed it was important that they be given 'progress bulletins'. The craft groups under 18 had comparatively low levels of agreement whilst the technician groups and lecturers achieved high levels of agreement when replying to their statements.

16) (113)(66)

Lecturers' reactions to the statement 'students think that it is important that they know the teaching methods to be adopted for each topic on the syllabus' was to answer just right of centre on the disagreement side of the opinion scale. The students were in actual fact more inclined to agree that they should know the teaching methods to be adopted, although showing a little uncertainty of how important this was. The standard deviation calculated indicated quite a high level of consistency amonst the opinions of all of the groups.

17) (114)(67)

All groups of students thought it important to quite a high level of agreement that when starting a new topic they know how much time is available to complete it. Lecturers did not anticipate students' reactions to this question, thinking that students in general would be undecided on this matter.

18) (115)(68) *

To the statement 'students think it important to be given a detailed syllabus so that they can check their progress in topics completed', lecturers offered opinions on how technicians would respond and how craft students would respond. Lecturers anticipated the craft students would return a mean of 2.918 and the technician students would return a mean of 2.428, this indicating that they thought technician students would consider it more important than craft students that a detailed syllabus be given them. In fact the craft groups on average thought it more important that they receive such a statement than did the technician groups.

19) (126)(79)

To varying levels of agreement, students were undecided as to whether they think it important that they be consulted on the teaching order of course topics. Students on average had opinions just left of centre whereas lecturers thought they would have opinions just right of centre.

20) (127)(80)

To the question 'how effective do you find revision every few weeks?' students thought that revision given in this way would be marginally effective as indeed lecturers agreed they would.

21) (128)(81)

The two groups of students under 18 thought that revision given at the end of each term would be reasonably effective. The remaining two over 18 student groups answered as lecturers thought they would with a degree of uncertainty, answering on the opinion scale just left of centre.

22) (129)(82)

The lecturers anticipated the opinions given by the technician over 18 group who thought that revision given at the end of the course would be reasonably effective. The remaining three groups of students were less positive on this point giving opinions just left of centre. All groups showed a comparatively wide range of scores.

23) (130)(83)

The technician student group when asked 'as an aid to learning, how effective do you consider tests to be when given every few weeks?' thought that tests given in this way would be effective in the learning process. The remaining groups of students responded in line with how lecturers thought they would, that is with a degree of neutrality. Only the craft under 18 had a high level of agreement in their opinions, the agreement of opinion amongst the remaining groups being either poor or low.

24) (131)(84)

All groups scored as lecturers decided they would, that is just left of centre, showing that students were relatively undecided whether, as an aid to learning, tests given at the end of each term are effective.

25) (132)(85)

In response to the question 'as an aid to learning, how effective do you consider tests to be when given at the end of the course?', the craft under 18 and the technicians over 18 were of the opinion that tests given in this way would be marginally effective. The remaining two groups of students were less certain and tended to be neutral to a slightly greater extent than expected by lecturers.

26) (133)(86)

Lecturers thought that students would be undecided what to answer to the following question 'how clearly does the following statement tell you what you are expected to learn by the end of a teaching session?' 'SPECIAL CLOTHING (SAFETY) USE OF OVERALLS, GOGGLES, FOOTWEAR ETC., DANGERS OF EVERYDAY CLOTHING'.

The technician students over 18 did have a tendency to neutrality but the two groups of craft students and the technician under 18 group all thought the statement marginally clear.

27) (134)(87)

Students were asked 'how clearly does the following statement tell you what you are expected to learn by the end of a teaching session? (a) GIVEN A LIST OF PROCESSES AND MACHINES AND A LIST OF PROTECTIVE CLOTHING, MATCH THE PROTECTIVE CLOTHING TO THE CORRESPONDING PROCESS OR MACHINE. (b) STATE THAT, WHEN IN THE PROXIMITY OF MOVING MACHINERY, IT IS DANGEROUS TO WEAR (i) loose ties (ii) loose clothing (iii) rings and watches (iv) loose hair. (c) DISPLAY SAFETY CONSCIOUSNESS BY WEARING THE CORRECT CLOTHING'.

The craft under 18 students although scoring a high standard deviation thought, as did the rest of the student groups, that the statement given was quite clear, this reaction being as expected by lecturers.

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	79	32	28	1.776	1.112	+
CRAFT OVER 18				1.308	0.636	+++
TECH UNDER 18				1.414	0.720	+++
TECH OVER 18				1.255	0.524	+++
LECTURERS				1.756	0.835	+++
CRAFT UNDER 18	81	34	30	1.968	1.402	-
CRAFT OVER 18				1.478	0.859	+++
TECH UNDER 18				1.436	0.677	+++
TECH OVER 18				1.489	0.680	+++
LECTURERS				1.581	0.822	+++
CRAFT UNDER 18	83	36	32	3.042	1.147	+
CRAFT OVER 18				3.457	1.396	-
TECH UNDER 18				3.042	1.287	-
TECH OVER 18				2.936	1.397	-
LECTURERS				2.810	1.204	-

TABLE 10.3

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	87	40	36	2.297	1.029	++
CRAFT OVER 18				2.638	1.137	+
TECH UNDER 18				2.138	1.016	++
TECH OVER 18				2.297	0.954	+++
LECTURERS				2.891	0.952	+++
CRAFT UNDER 18	88	41	37	2.712	1.068	++
CRAFT OVER 18				2.872	1.222	-
TECH UNDER 18				2.723	1.307	-
TECH OVER 18				2.808	1.273	-
LECTURERS				3	1.241	-
CRAFT UNDER 18	93	46	42	2.5	1.007	++
CRAFT OVER 18				2.680	1.023	++
TECH UNDER 18				2.585	0.982	+++
TECH OVER 18				2.425	1.096	++
LECTURERS				2.797	0.972	+++

TABLE 10.3 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	100	53	49	2.521	1.038	++
CRAFT OVER 18				2.521	1.098	++
TECH UNDER 18				2.276	0.993	+++
TECH OVER 18				2.531	1.088	++
LECTURERS				2.675	0.902	+++
CRAFT UNDER 18	101	54	50	2.446	1.077	++
CRAFT OVER 18				2.691	1.111	+
TECH UNDER 18				2.606	1.023	++
TECH OVER 18				2.563	1.047	++
LECTURERS				2.891	1.077	++
CRAFT UNDER 18	102	55	51	2.638	1.109	+
CRAFT OVER 18				2.787	1.253	-
TECH UNDER 18				2.606	1.083	++
TECH OVER 18				2.670	1.152	+
LECTURERS *				2.864	0.859	+++

TABLE 10.3 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	105	58	54	2.914	1.419	-
CRAFT OVER 18				3.223	1.346	-
TECH UNDER 18				2.978	1.157	+
TECH OVER 18				3.170	1.190	+
LECTURERS				3.027	1.207	-
CRAFT UNDER 18	106	59	55	2.776	1.272	-
CRAFT OVER 18				2.276	1.114	+
TECH UNDER 18				2.255	1.051	++
TECH OVER 18				1.936	0.943	+++
LECTURERS				2.581	0.958	+++
CRAFT UNDER 18	109	62	58	2.606	0.925	+++
CRAFT OVER 18				1.936	0.987	+++
TECH UNDER 18				2.085	0.941	+++
TECH OVER 18				1.787	0.861	+++
LECTURERS				2.5	0.904	+++

TABLE 10.3 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	110	63	59	2.606	0.901	+++
CRAFT OVER 18				1.989	0.939	+++
TECH UNDER 18				1.914	0.807	+++
TECH OVER 18				1.702	0.755	+++
LECTURERS				1.972	0.804	+++
CRAFT UNDER 18	111	64	60	2.595	1.151	+
CRAFT OVER 18				2.031	1.066	++
TECH UNDER 18				2.446	1.268	-
TECH OVER 18				2.031	1.025	++
LECTURERS				2.391	1.148	+
CRAFT UNDER 18	112	65	61	2.563	1.162	+
CRAFT OVER 18				2.180	1.120	+
TECH UNDER 18				2.053	0.891	+++
TECH OVER 18				2.138	0.995	+++
LECTURERS				2.554	0.932	+++

TABLE 10.3 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	113	66	62	2.372	0.811	+++
CRAFT OVER 18				2.457	1.007	++
TECH UNDER 18				2.308	0.799	+++
TECH OVER 18				2.436	1.005	++
LECTURERS				3.337	0.948	+++
CRAFT UNDER 18	114	67	63	2.074	1.044	++
CRAFT OVER 18				1.968	0.856	+++
TECH UNDER 18				2.319	1.033	++
TECH OVER 18				2.010	0.856	+++
LECTURERS				3.027	1.013	++
CRAFT UNDER 18	115	68	64	2.148	1.061	++
CRAFT OVER 18				2.095	1.011	++
TECH UNDER 18				2.457	0.883	+++
TECH OVER 18				2.148	0.886	+++
LECTURERS *				2.918	1.112	+

TABLE 10.3 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	126	79	75	2.521	1.260	-
CRAFT OVER 18				2.819	1.081	++
TECH UNDER 18				2.723	0.915	+++
TECH OVER 18				2.712	1.078	++
LECTURERS				3.378	1.270	-
CRAFT UNDER 18	127	80	76	2.521	1.155	+
CRAFT OVER 18				2.510	1.294	-
TECH UNDER 18				2.563	1.037	++
TECH OVER 18				2.617	1.062	++
LECTURERS				2.702	1.123	+
CRAFT UNDER 18	128	81	77	2.308	1.101	+
CRAFT OVER 18				2.585	1.232	-
TECH UNDER 18				2.542	1.208	-
TECH OVER 18				2.244	1.126	+
LECTURERS				2 486	0.975	+++

TABLE 10.3 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	129	82	78	2.457	1.117	+
CRAFT OVER 18				2.595	1.323	-
TECH UNDER 18				2.574	1.340	-
TECH OVER 18				2.265	1.289	-
LECTURERS				2.216	1.118	+
CRAFT UNDER 18	130	83	79	2.574	0.916	+++
CRAFT OVER 18				2.606	1.290	-
TECH UNDER 18				2.074	1.141	+
TECH OVER 18				2.510	1.381	-
LECTURERS				2.554	1.140	+
CRAFT UNDER 18	131	84	80	2.734	1.053	++
CRAFT OVER 18				2.585	1.386	-
TECH UNDER 18				2.510	1.209	-
TECH OVER 18				2.425	1.198	+
LECTURERS				2.513	0.975	+++

TABLE 10.3 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	132	85	81	2.255	1.110	+
CRAFT OVER 18				2.659	1.477	-
TECH UNDER 18				2.819	1.557	-
TECH OVER 18				2.393	1.400	-
LECTURERS				2.540	1.153	+
CRAFT UNDER 18	133	86	82	2.265	1.063	++
CRAFT OVER 18				2.393	1.074	++
TECH UNDER 18				2.382	1.313	-
TECH OVER 18				2.648	1.191	+
LECTURERS				3.040	1.201	-
CRAFT UNDER 18	134	87	83	2.138	1.242	-
CRAFT OVER 18				1.893	0.916	+++
TECH UNDER 18				1.648	0.821	+++
TECH OVER 18				2.063	1.137	+
LECTURERS				2.135	1.094	++

TABLE 10.3 CONTINUED

28) (148)

It is true to say that all students who were asked to indicate their preferences as to the 'type' of course they would like to attend, had little knowledge of the alternatives to the one they were already attending which was a part-time day or part-time day and evening course. Nevertheless all students had the opportunity to meet students attending other types of courses during their day at college and were in a reasonable position to comment and make comparisons.

It is quite clear that, in the opinion of the motor vehicle student, as far as they are concerned the part-time day and evening option is by far the most popular of the alternatives. Taking all groups of students together, the percentages choosing the various courses are as follows:-

PART-TIME DAY AND EVENING AT THE TECHNICAL COLLEGE	=	56%
BLOCK RELEASE AT THE TECHNICAL COLLEGE	=	14%
ALL ON-THE-JOB TRAINING AT THE STUDENT'S FIRM	=	14%
EVENING ONLY AT THE TECHNICAL COLLEGE	=	12%
FULL-TIME AT THE TECHNICAL COLLEGE	=	4%
ALL OFF-THE-JOB TRAINING AT THE STUDENT'S FIRM	=	0.5%

STUDENT'S PREFERENCE TO TYPE OF COURSE HE WOULD LIKE TO ATTEND

TABLE 10.4

TYPE OF COURSE	Craft under 18 yrs	Craft over 18 yrs	Tech. under 18 yrs	Tech. over 18 yrs
Block Relase at the Technical College	15	16	10	12
Full time at the Technical College	6	6	1	4
Part-time day and evening at the Technical College	54	42	54	57
Evening only at the Technical College	9	11	11	14
All-on-the-job training at your firm	11	15	17	6
All off-the-job training at your firm	-	-	1	1

COMMENTS ON OTHER FORMAL TRAINING COURSES THE STUDENTS HAD ATTENDED

Replies from the four groups of students were:-

(a) CRAFT STUDENTS UNDER 18 YEARS OF AGE:- 8 students had attended other formal courses as follows:-

TABLE 10.5

COURSE	COMMENT
Manufacturer's course	Good
Welding course at college	Very Good
Training board course	Poor
Partsman's course at college	Very Good
Business management course	Excellent

COURSE	COMMENT
Vehicle bodywork course at college	Very Good
Training board course	Poor
Partsman's course at college	Excellent

(b) CRAFT STUDENTS OVER 18 YEARS OF AGE: - 29 students listed 33 courses as follows:-

COURSE	COMMENT
Training board course	5 students said 'POOR'
	5 " " 'ADEQUATE'
	8 " " 'GOOD'
	1 " " 'VERY GOOD'
Manufacturer's courses	3 students said 'ADEQUATE'
	7 " " 'GOOD'
	2 " " 'VERY GOOD'
	1 " " 'EXCELLENT'
Correspondence course	1 student said 'GOOD'

(c) TECHNICIAN STUDENTS UNDER 18 YEARS OF AGE:- 24 students listed 25 courses as follows:-

COURSE	COMMENT
Training board course	13 students said 'POOR'
	7 " " 'ADEQUATE'
	3 " " 'GOOD'
	1 " " 'VERY GOOD'
British Leyland correspondence	1 students said 'GOOD'

(d) TECHNICIAN STUDENTS OVER 18 YEARS OF AGE:- 44 students listed 45 courses as follows:-

COURSE	COMMENT
Training board course	11 students said 'POOR'

COURSE	COMMENT
Training board course	8 students said 'ADEQUATE'
	9 " " 'GOOD'
	4 " " 'VERY GOOD'
Manufacturers courses	1 student said 'POOR'
	3 students said 'GOOD'
	2 " " 'VERY GOOD'
	4 " " 'EXCELLENT'
Basic welding course at college	1 student said 'VERY GOOD'
Internal works course	1 student said 'VERY GOOD'
	1 " " 'EXCELLENT'

Questions asked of students about the other formal courses they had attended were designed to find out whether they thought the course(s) were in their opinion poor; adequate; good; very good; or excellent.

By compiling the results together, as can be seen in table 10.6, it emerges that the two most common courses attended by students other that part-time craft or technician courses were Training board courses and manufacturers' courses.

Between the two types of course it can be seen that the manufacturers' courses were considered far better by students than were the Road Transport Industrial Training Board courses. Forty per cent of students taking training board courses thought that they were poor compared with ony 4% thinking that manufacturers' courses were poor. Few students had attended other types of formal courses, but of those attended, students found them to be very good or excellent.

TABLE 10.6

COURSE ATTENDED	NUMBER TAKING COURSE	FREQUENCY OF COMMENT (ALL GROUPS)				
		POOR	ADEQUATE	GOOD	VERY GOOD	EXCELLENT
Manufacturers Course	24	1 = 4%	3 = 13%	11 = 46%	4 = 17%	5 = 21%
Training Board Course	77	31 = 40%	20 = 26%	20 = 46%	6 = 8%	
Welding Course at College	2				2	
Partsman's Course	2				1	1
Business Man. Course	1					1
Vehicle Body Course	1				1	
Correspondence Course	2			2		
Works Course (Own Firm)	2				1	1

15) (150 - 154)(94 - 98) HOMEWORK ACTIVITIES

There were 376 students and 74 lecturers who completed this questionnaire. Consequently, when considering individual responses concerning the most effective homework activity, numbers of 37 or above represent a 50% + agreement amongst lecturers for that particular method. In the case of students' responses, a figure of 47 or over represents a 50% + agreement level. It can be seen that lecturers achieved this level of 50% once. The craft students over 18 achieved 50% once and the technicians over 18 achieved this figure twice.

On average the percentage agreement by lecturers to the most effective homework activities is 37.4% for the three highest choices while the students achieved an average of 28.13% for their three highest choices.

When making comparisons between lecturers' three highest choices and the three highest choices of the individual student groups there is an average of 58% agreement as to the most efficient homework activities for the various subjects given.

In chart 10.7 - 10.11, the lecturers' responses concerning the most efficient homework activities for each of the subjects given can be compared to responses given by the student participants grouped together, the percentages scored by the 74 lecturers being compared to the percentages scored by the 376 students.

15) (150 - 154)(94 - 98) HOMEWORK ACTIVITIES

The three highest responses by the lecturers and students are indicated on the charts.

TABLE 10.7 SUBJECT	HOME-WORK NOT NEEDED	COPYING UP NOTES	PRACTISING OF ROUTINE SKILLS/ PROCEDURES	TACKLING NEW PROBLEMS	WORKING THROUGH SELF STUDY PACKAGES	COLLECTING INFORMATION FROM WORK	READING TEXT BOOKS
TECHNOLOGY					21	42	33
SCIENCE				25	23		33
MATHEMATICS				33	23		21
WORKSHOP PRACTICE	25		31			34	
INDUSTRIAL STUDS	29				18		24

RESPONSES OF CRAFT STUDENTS UNDER 18 YEARS OF AGE

TABLE 10.8	HOME-WORK NOT NEEDED	COPYING UP NOTES	PRACTISING OF ROUTINE SKILLS/ PROCEDURES	TACKLING NEW PROBLEMS	WORKING THROUGH SELF STUDY PACKAGES	COLLECTING INFORMATION FROM WORK	READING TEXT BOOKS
TECHNOLOGY	27	35					23*
SCIENCE	29			16*			20*
MATHEMATICS	24		18	34*			
WORKSHOP PRACTICE			34*	28		29*	
INDUSTRIAL STUDS	22*	25					20*

AREAS OF AGREEMENT BETWEEN LECTURERS AND STUDENTS ARE MARKED WITH ASTERISKS ON THE STUDENTS' CHARTS.

HOMEWORK ACTIVITIES RESPONSES OF CRAFT STUDENTS OVER 18 YEARS OF AGE

TABLE 10.9

SUBJECT	HOME-WORK NOT NEEDED	COPYING UP NOTES	PRACTISING OF ROUTINE SKILLS/ PROCEDURES	TACKLING NEW PROBLEMS	WORKING THROUGH SELF STUDY PACKAGES	COLLECTING INFORMATION FROM WORK	READING TEXT BOOKS
TECHNOLOGY		30				23*	30*
SCIENCE	35	19					22*
MATHEMATICS	34	24		17*			
WORKSHOP PRACTICE	42*		24*	24			
INDUSTRIAL STUDIES	48*	17					20*

TABLE 10.10 RESPONSES OF TECHNICIAN STUDENTS UNDER 18 YEARS OF AGE

TECHNOLOGY		26		19			41*
SCIENCE		24		22*			27*
MATHEMATICS	22	20		31*			
WORKSHOP PRACTICE	31*		37*	29			
INDUSTRIAL STUDIES	41*	16					20*

TABLE 10.11 RESPONSES OF TECHNICIAN STUDENTS OVER 18 YEARS OF AGE

TECHNOLOGY		31				27*	48*
SCIENCE	22	22		25*			35*
MATHEMATICS	21			29*			23*
WORKSHOP PRACTICE	38*		30*			24*	
INDUSTRIAL STUDIES	50*			11			16*

TABLE 10.12 CHOICE OF HOMEWORK ACTIVIES RELATING TO TECHNOLOGY

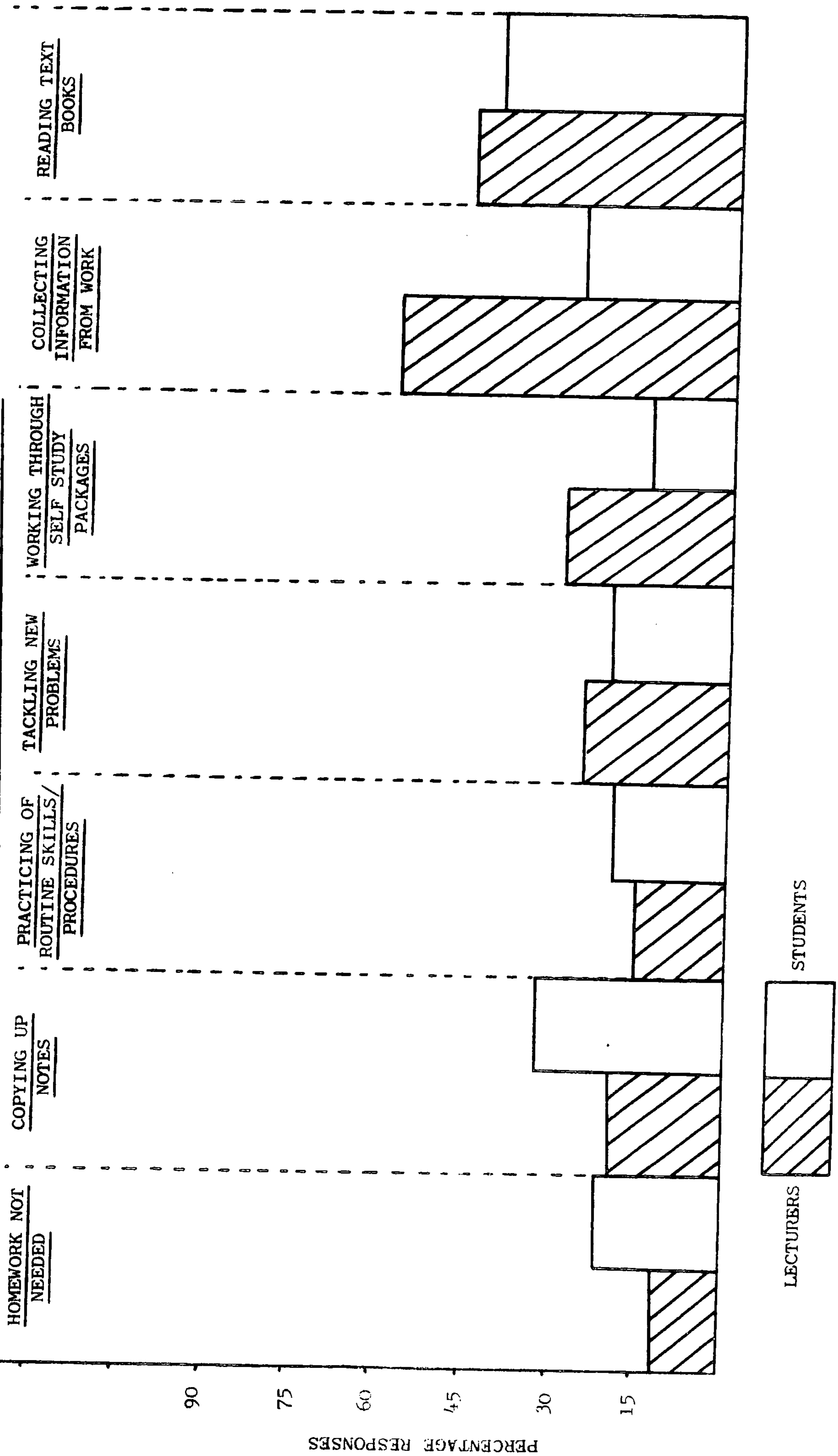


TABLE 10.13 CHOICE OF HOMEWORK ACTIVITIES RELATING TO SCIENCE

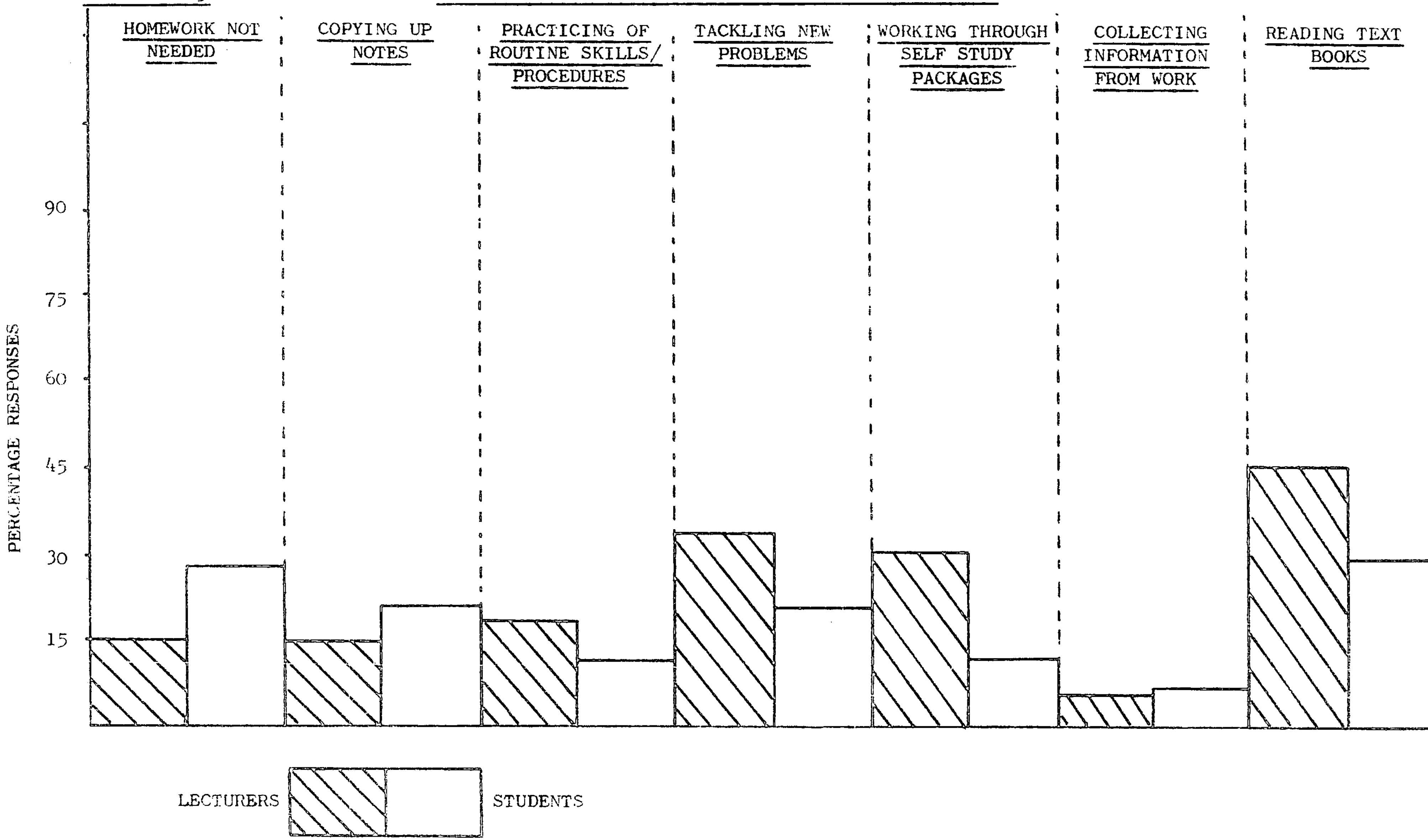


TABLE 10.14

CHOICE OF HOMEWORK ACTIVITIES RELATING TO MATHEMATICS

TABLE 10.15 CHOICE OF HOMEWORK ACTIVITIES RELATING TO WORKSHOP PRACTICE

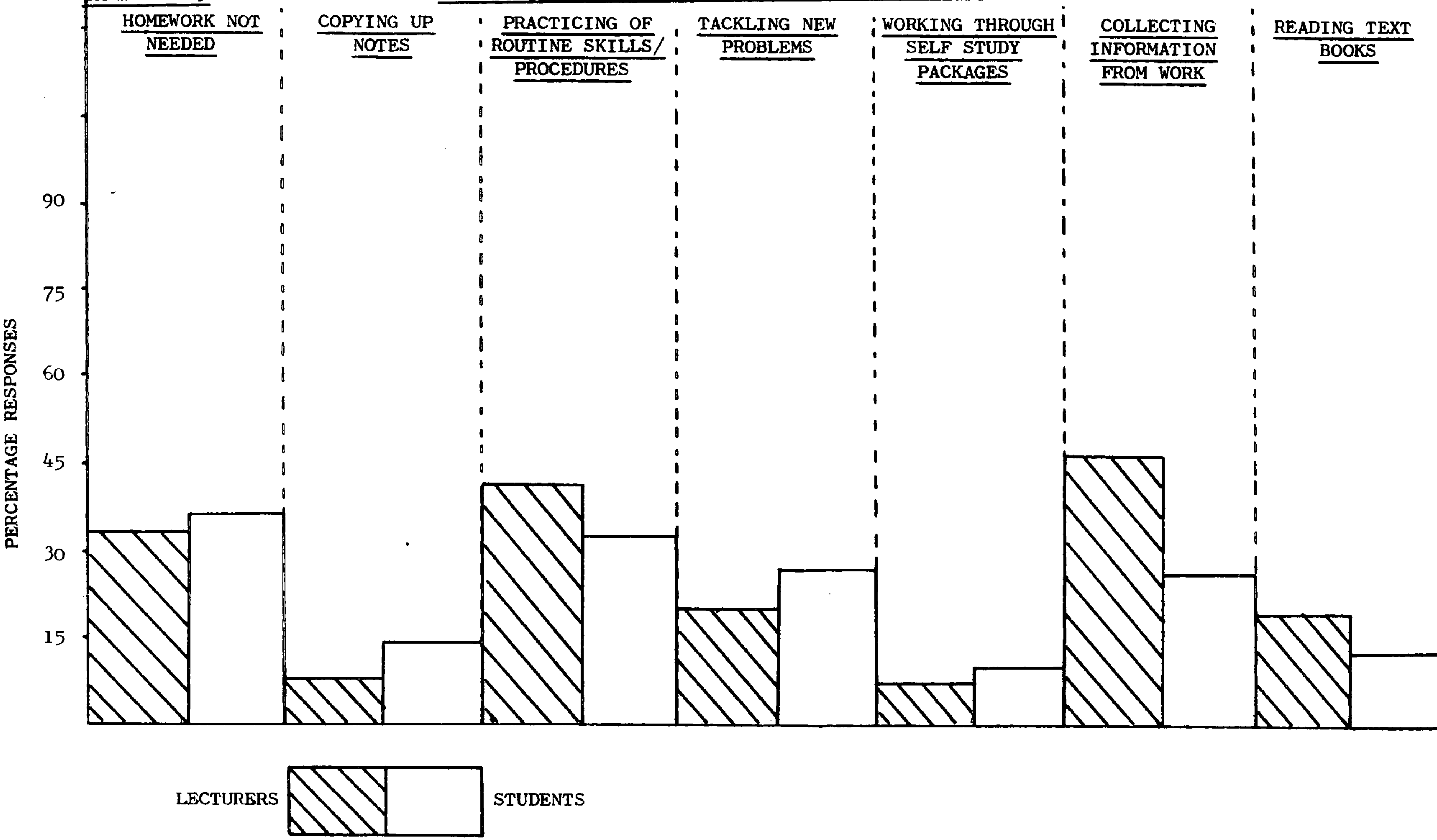
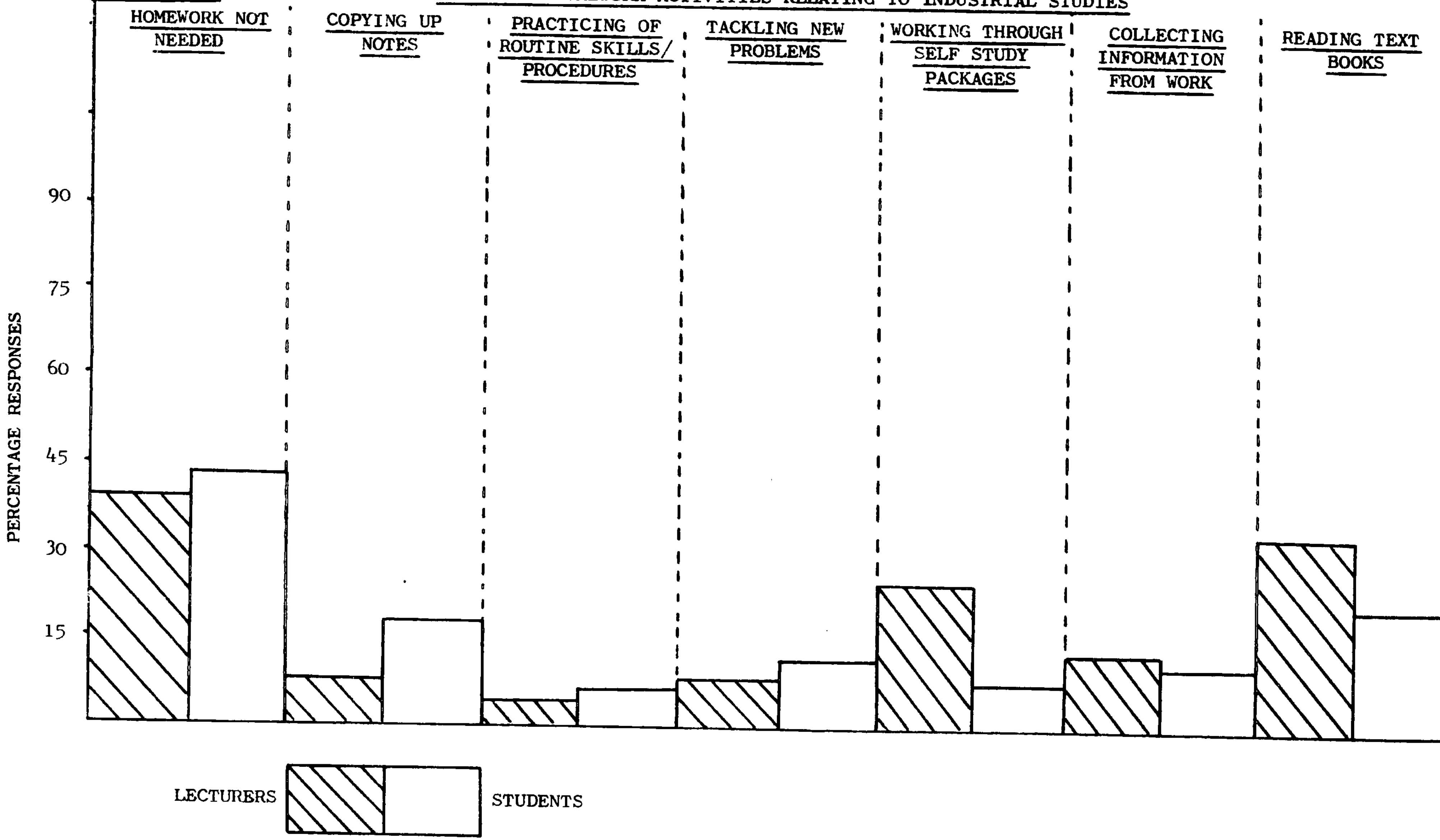


TABLE 10.16

CHOICE OF HOMEWORK ACTIVITIES RELATING TO INDUSTRIAL STUDIES



17) (155 - 159)(99 - 103)

STUDENTS RECORD OF INFORMATION

The students and lecturers were asked to choose which in their opinion is the best method of assembling notes for the subject of technology, science, mathematics, workshop practice and general/ industrial studies. The methods given of recording information were dictation from the teacher, notes from the blackboard, class handouts, use of text books, personally constructed notes.

From tables 10.17 - 10.21 it can be seen that the 50% + level i.e. a score of 37+ for teachers and 47+ for students, is achieved 9 times by the lecturers out of a maximum of 15 and 7 times out of a maximum of 60 by the students in the three highest responses for each subject.

The average percentage agreement of all subjects for all three placements is 53.467% for lecturers and an average of 36.33% agreement is obtained on average by all the students. It is quite extraordinary that when making comparisons between the lecturers' three highest scoring choices of recording of information and the students' highest scores, how often the highest scoring choices are the same, the technician students over 18 agreeing with 14 of the fifteen lecturers' choices.

STUDENTS RECORD OF INFORMATION

The three highest responses for the various groups are shown in the tables.

Areas of agreement between students and teachers are marked with asterisks.

RESPONSES FROM LECTURERS

TABLES 10.17 - 10.21	DICTATION FROM TEACHER	NOTES FROM BLACKBOARD	CLASS HANDOUTS	USE OF TEXT BOOKS	OWN MADE NOTES
TECHNOLOGY	37	53	50		
SCIENCE		60	39	37	
MATHEMATICS		58	30	42	
WORKSHOP PRACTICE			34	18	40
GEN/INDUSTRIAL STUDS			33	28	33

RESPONSES FROM CRAFT STUDENTS UNDER 18 YEARS OF AGE

TECHNOLOGY	30*	40*	40*		
SCIENCE		31*	31*	29*	
MATHEMATICS		45*	23*	32*	
WORKSHOP PRACTICE	25		32*		33*
GEN/INDUSTRIAL STUDS		30	27*		22*

RESPONSES FROM CRAFT STUDENTS OVER 18 YEARS OF AGE

TECHNOLOGY	34*	51*	41*		
SCIENCE	29	44*	34*		
MATHEMATICS	22	50*	22*	24*	
WORKSHOP PRACTICE		29	27*		40*
GEN/INDUSTIRAL STUDS	35	22	32*		22*

RESPONSES FROM TECHNICIANS UNDER 18 YEARS OF AGE

TECHNOLOGY	30*	46*	45*		
SCIENCE	25	48*	42*	25*	
MATHEMATICS		60*	20*	33*	
WORKSHOP PRACTICE	22	22	30*		45*
GEN/INDUSTRIAL STUDS	28	24	28*		

RESPONSES FROM TECHNICIANS OVER 18 YEARS OF AGE

TECHNOLOGY	44*	42*	49*		
SCIENCE		55*	42*	32*	
MATHEMATICS		58*	29*	32*	
WORKSHOP PRACTICE			27*	25*	40*
GEN/INDUSTRIAL STUDS	31		21*		23*

TABLE 10.22

CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO TECHNOLOGY

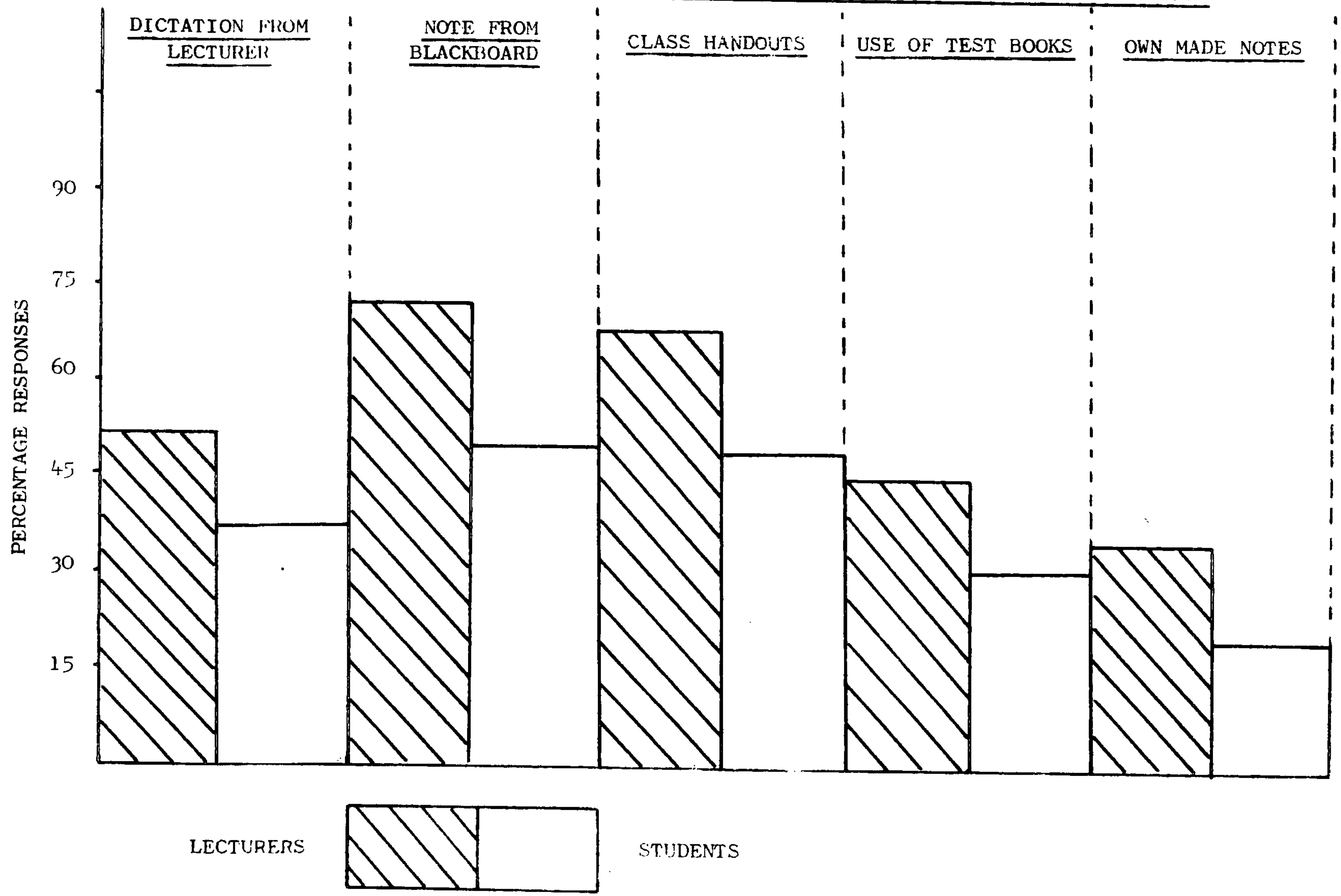


TABLE 10.23 CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO SCIENCE

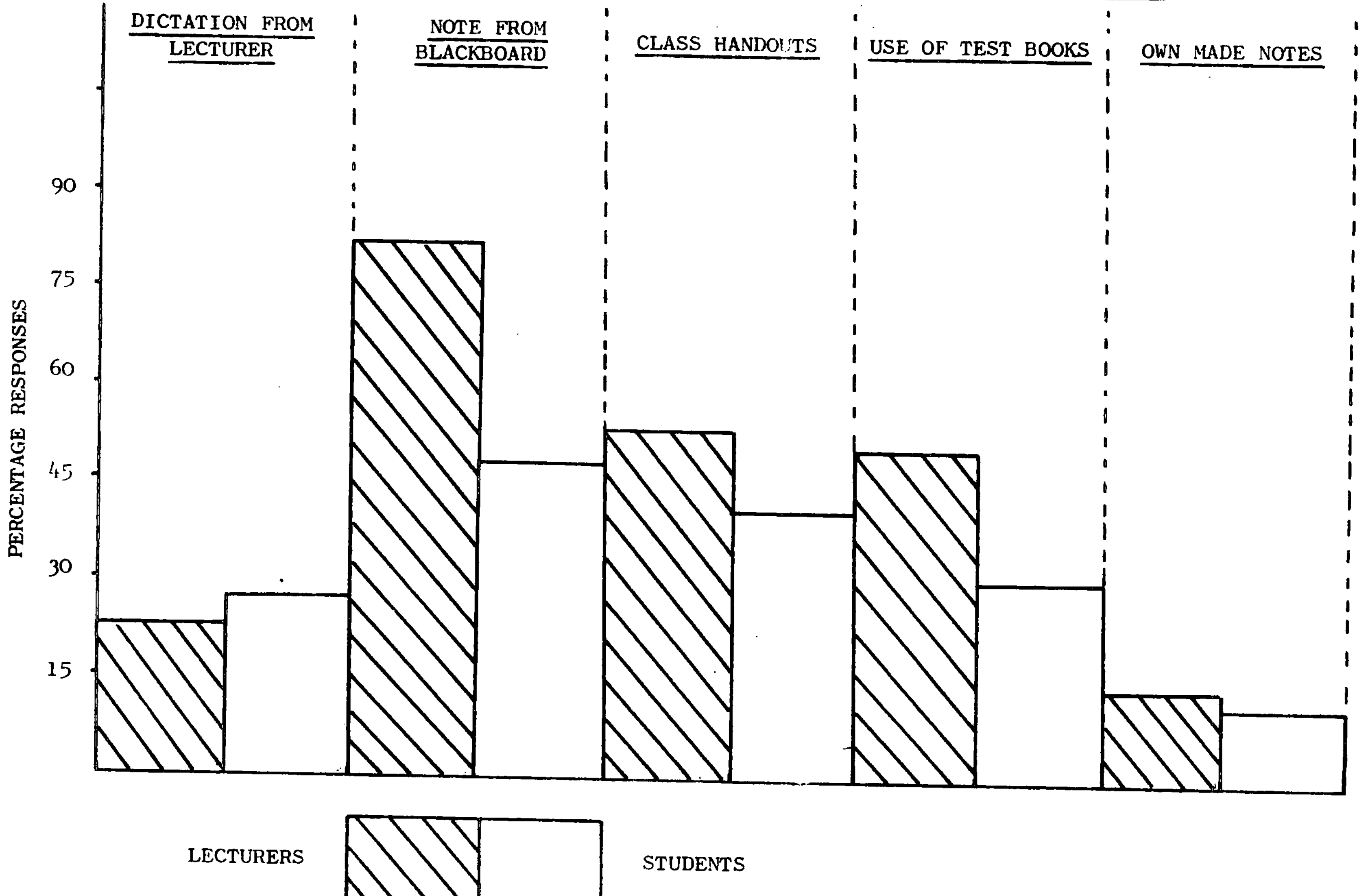


TABLE 10.24 CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO MATHEMATICS

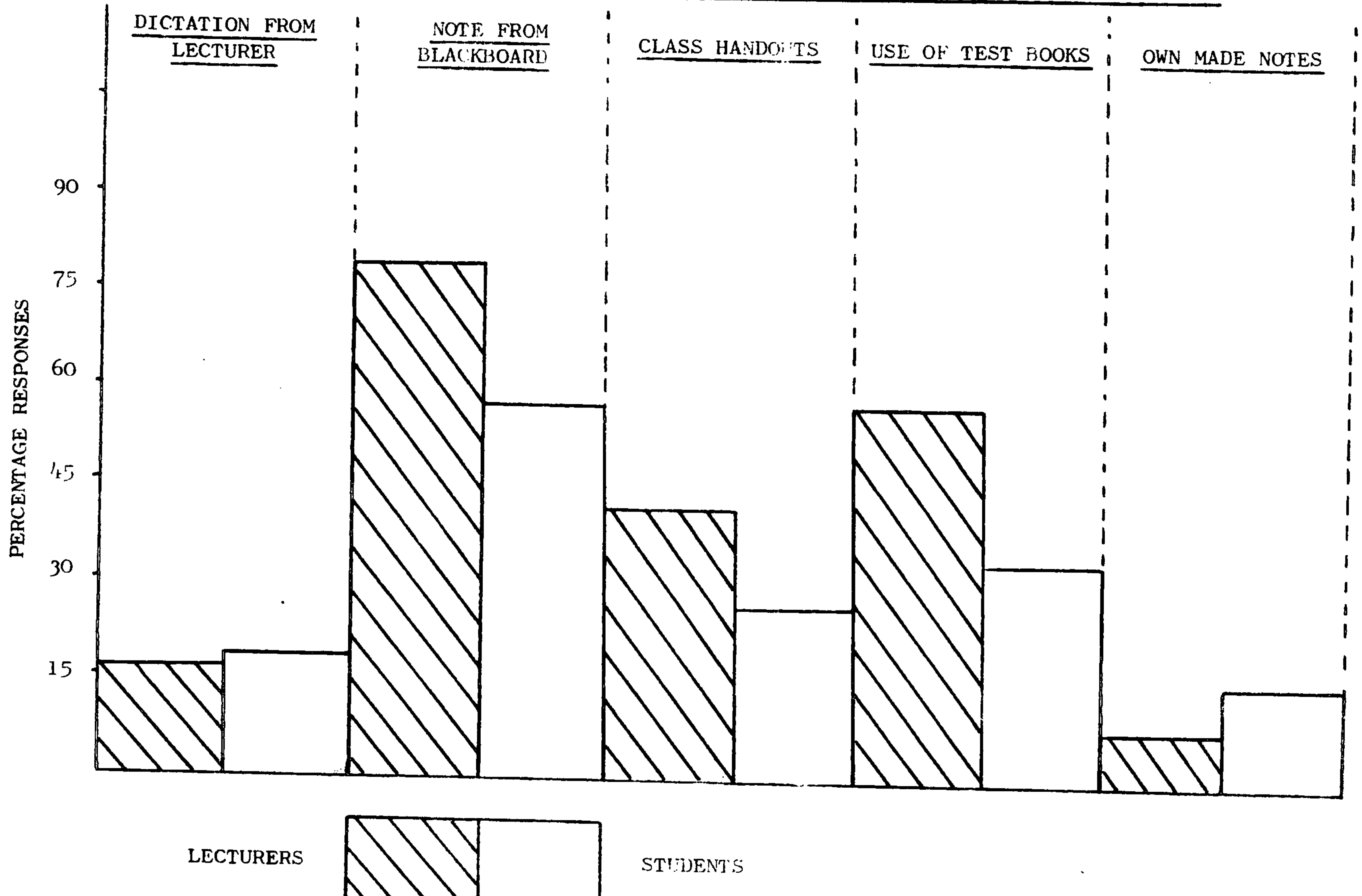


TABLE 10.25 CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO WORKSHOP PRACTICE

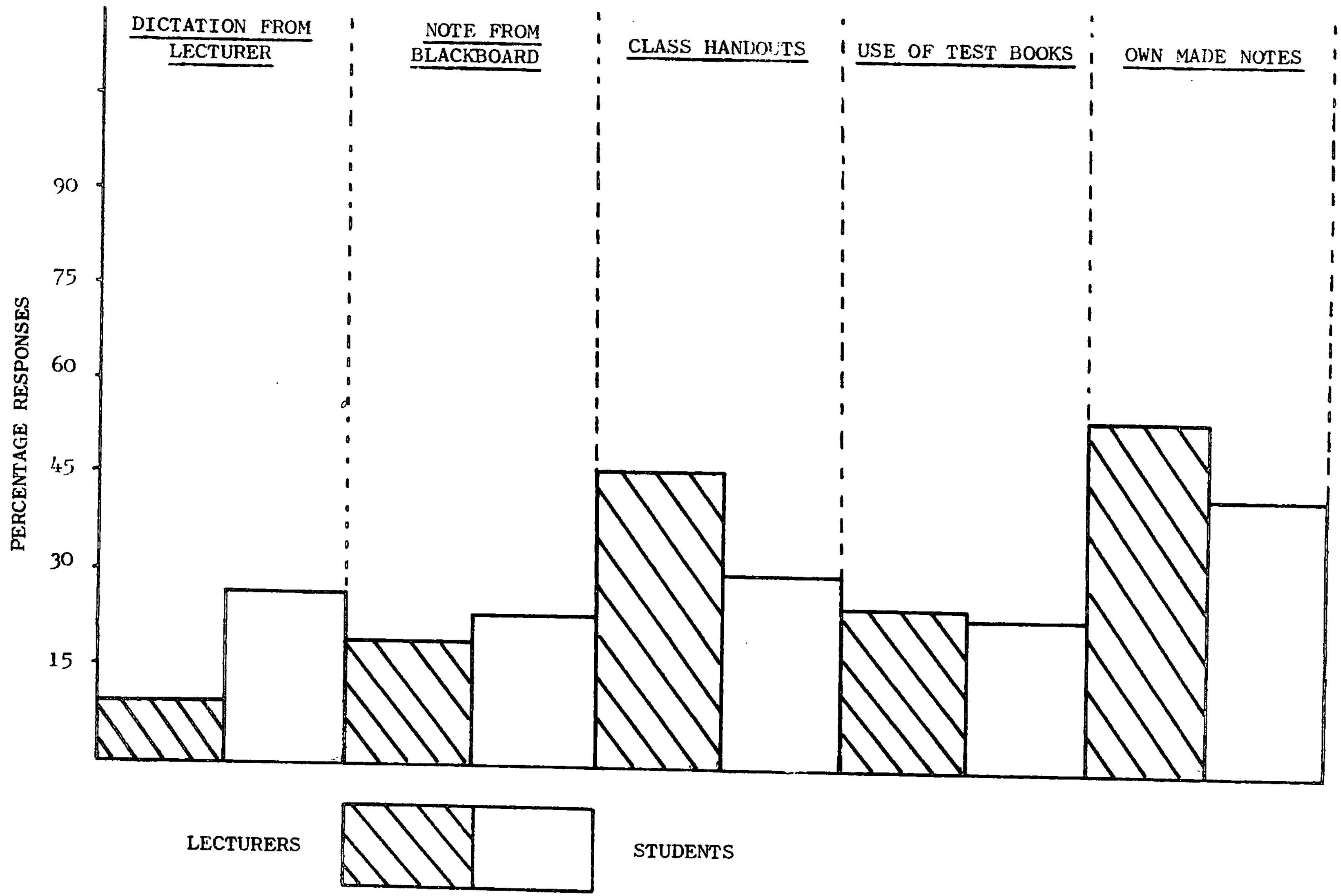
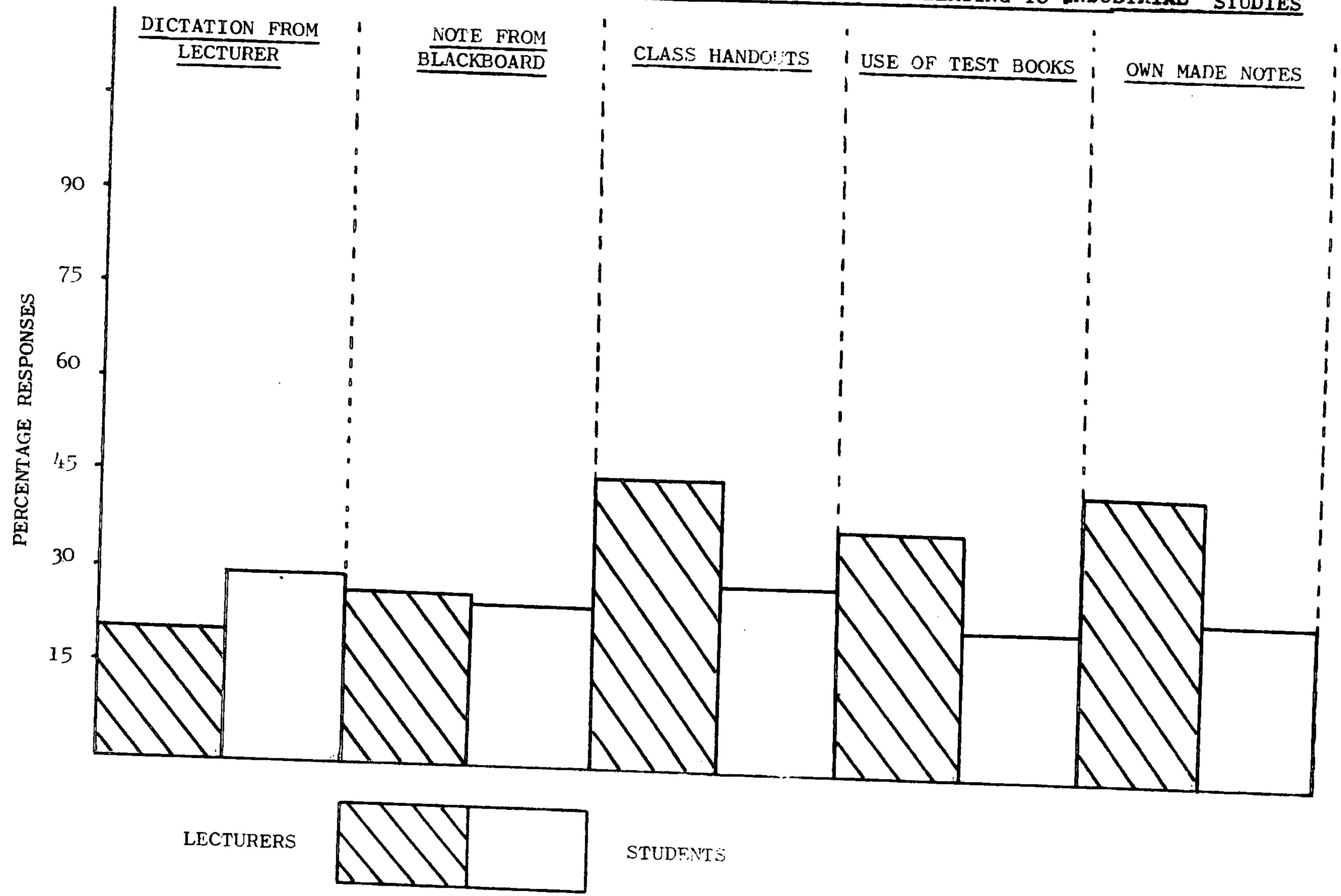


TABLE 10.26

CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO INDUSTRIAL STUDIES



18) (160 - 164)(104 - 108)

TEACHING METHODS/LEARNING ACTIVITIES

The agreement between lecturers and students is quite remarkable in that, out of the maximum of fifteen placements, students are in agreement with lecturers as to the 'best' teaching methods for the given subjects in thirteen areas at the bottom end and fifteen out of fifteen at the top end.

Lecturers and all groups of students thought that the most efficient teaching/learning activities are (a) Exposition (b) Question and answers followed by (c) Laboratory and workshop activities.

From table 10.27 - 10.31 the 37+ and the 47+ score necessary, for lecturers and students respectively, to achieve a 50% agreement per activity for each subject is achieved 12 times out of 15 by the lecturers and 8 times out of a possible 60 by the students.

There was much agreement between lecturers and students as to the best teaching methods and/or learning activities, however the lecturers were much more definite in their responses.

TEACHING METHODS/LEARNING ACTIVITIES

The three highest responses for all groups are shown. Areas of agreement between students and lecturers are marked with asterisks.

TABLE 10.27 RESPONSES FROM LECTURERS

	EXPOSITION	QUESTIONS AND ANSWERS	GROUP DISCUSSIONS + ASSIGNMENTS	INDIVIDUAL TUTORIALS	SELF STUDY	PRACTICE	LAB AND WORKSHOP ACTIVITIES
TECHNOLOGY	68	57				21	21
SCIENCE	59	41					41
MATHEMATICS	56	43				36	
WORKSHOP PRACTICE	39					49	52
INDUSTRIAL STUDIES	37	24	42				

TABLE 10.28 RESPONSES FROM CRAFT STUDENTS UNDER 18 YEARS OF AGE

	EXPOSITION	QUESTIONS AND ANSWERS	GROUP DISCUSSIONS + ASSIGNMENTS	INDIVIDUAL TUTORIALS	SELF STUDY	PRACTICE	LAB AND WORKSHOP ACTIVITIES
TECHNOLOGY	43*	35*	21				
SCIENCE	31*	22*					27*
MATHEMATICS	28*	30*	20				
WORKSHOP PRACTICE	26*					39*	35*
INDUSTRIAL STUDIES	22*	19*	24*				

TABLE 10.29 RESPONSES FROM CRAFT STUDENTS OVER 18 YEARS OF AGE

	EXPOSITION	QUESTIONS AND ANSWERS	GROUP DISCUSSIONS + ASSIGNMENTS	INDIVIDUAL TUTORIALS	SELF STUDY	PRACTICE	LAB AND WORKSHOP ACTIVITIES
TECHNOLOGY	49*	42*					25*
SCIENCE	42*	37*					32*
MATHEMATICS	36*	38*				21*	
WORKSHOP PRACTICE	26*					40*	38*
INDUSTRIAL STUDIES	31*	31*	28*				

TABLE 10.30

RESPONSES FROM TECHNICIAN STUDENTS UNDER 18 YEARS OF AGE

	EXPOSITION	QUESTIONS AND ANSWERS	GROUP DISCUSSIONS AND ASSIGNMENTS	INDIVIDUAL TUTORIALS	SELF STUDY	PRACTICE	LABORATORY AND WORKSHOP ACTIVITIES
TECHNOLOGY	64*	41*	28				
SCIENCE	52*	35*					32*
MATHEMATICS	39*	46*				25*	
WORKSHOP PRACTICE	35*					44*	52*
INDUSTRIAL STUDIES	27*	26*	34*				

TABLE 10.31

RESPONSES FROM TECHNICIAN STUDENTS OVER 18 YEARS OF AGE

TECHNOLOGY	62*	47*			28		
SCIENCE	53*	37*					37*
MATHEMATICS	43*	39*		23			
WORKSHOP PRACTICE	37*					44*	54*
INDUSTRIAL STUDIES	32*	25*	44*				

TABLE 10.32

CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO TECHNOLOGY

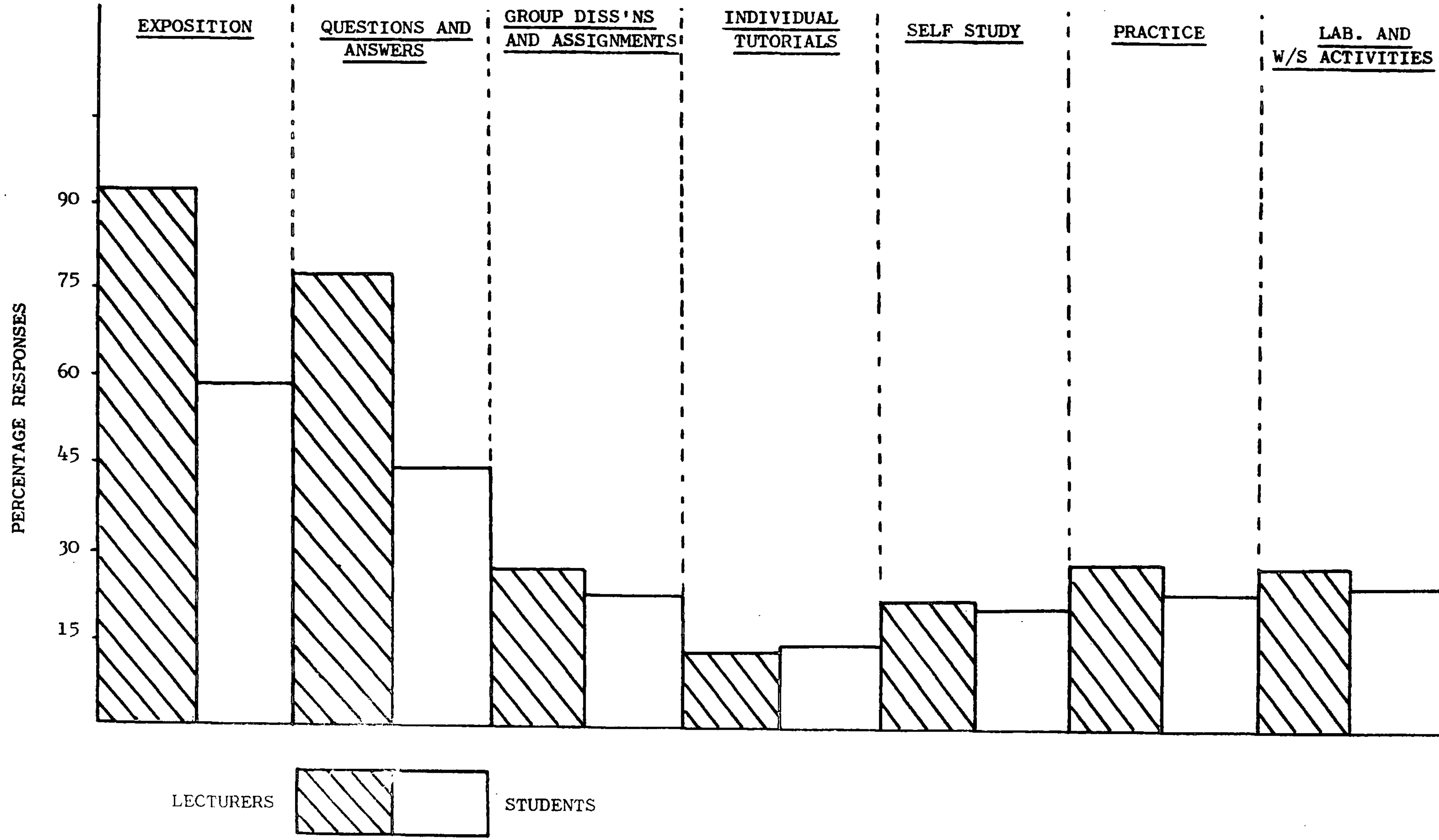


TABLE 10.33 CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO SCIENCE

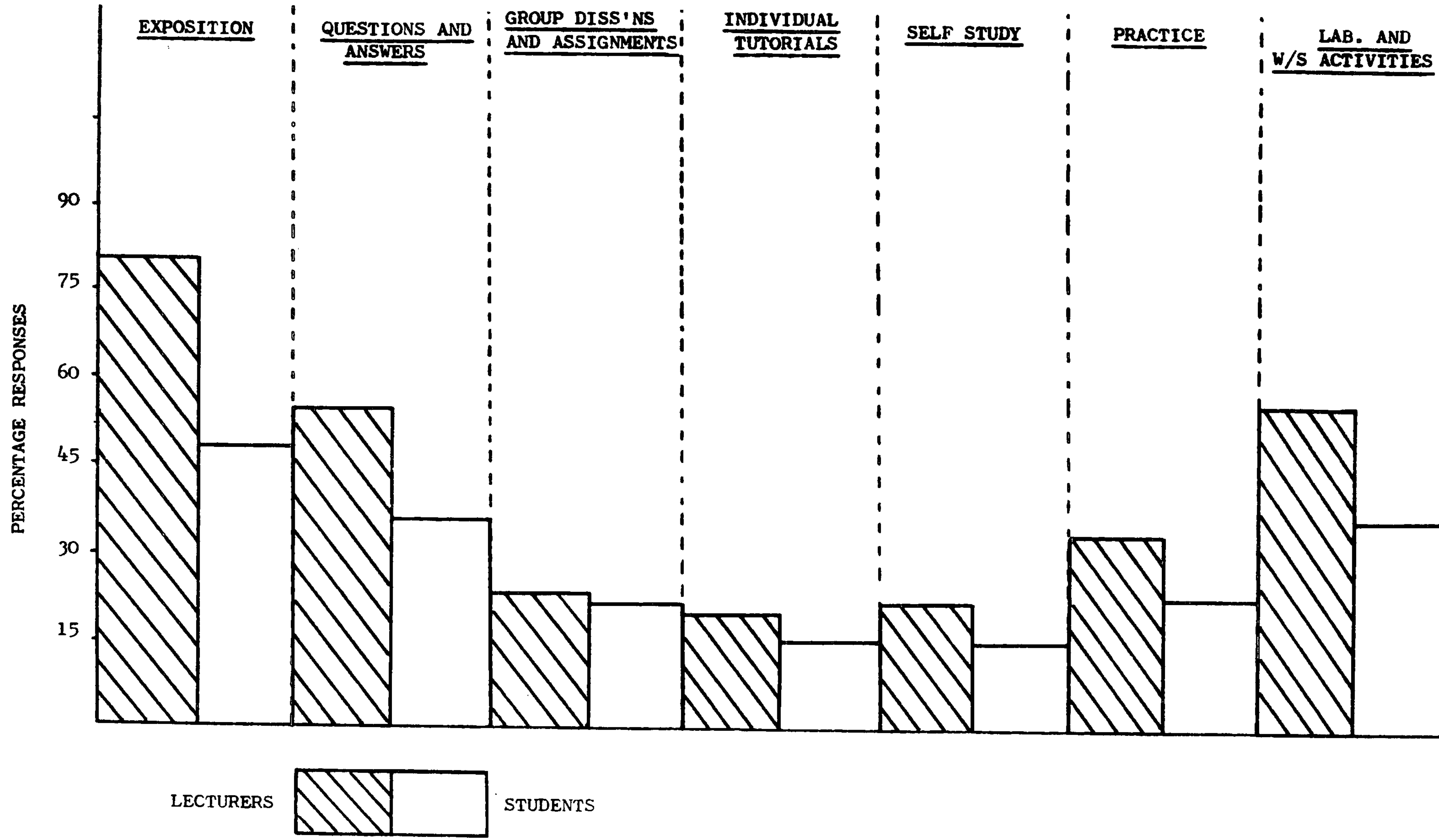


TABLE 10.34 CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO MATHEMATICS

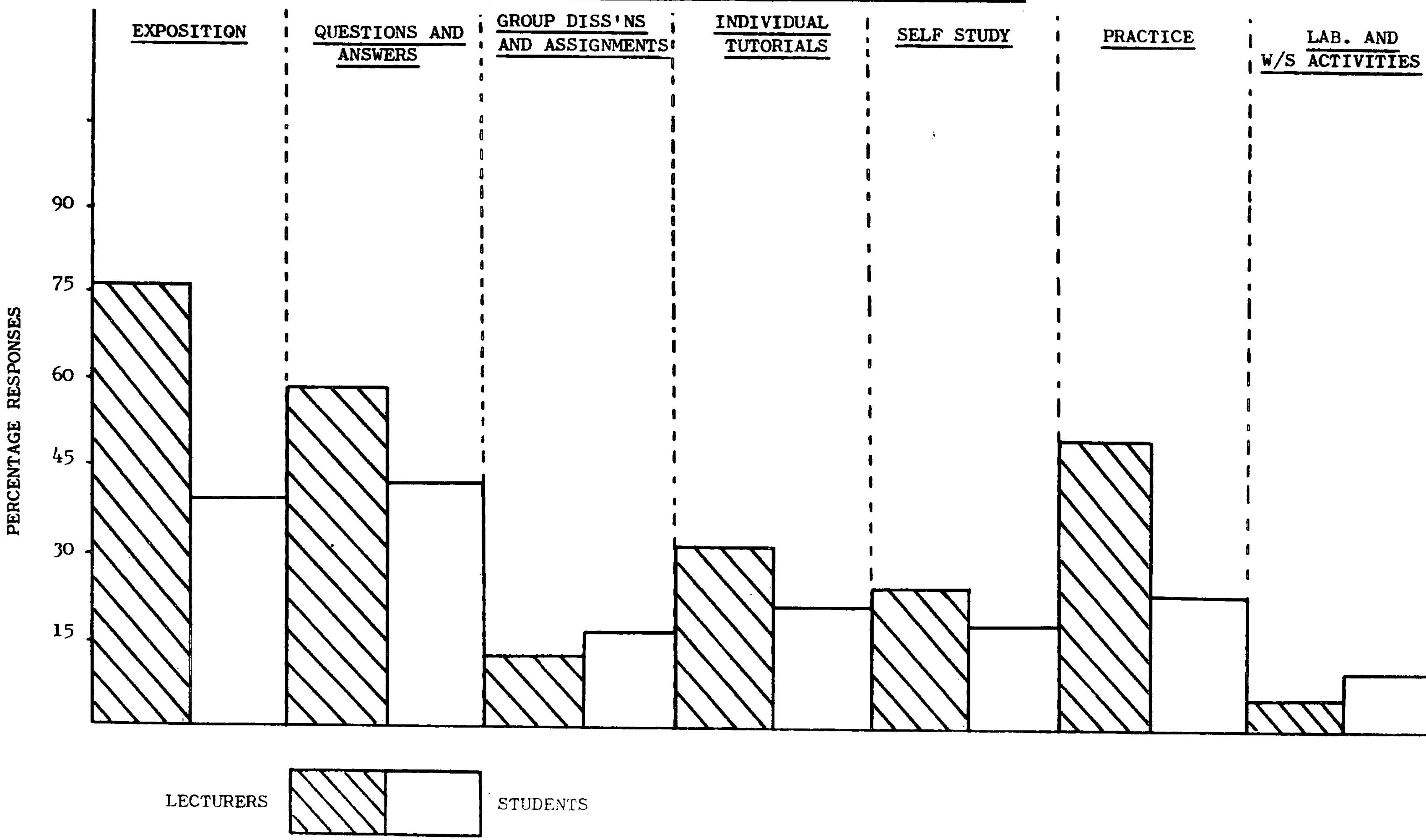


TABLE 10.35 CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO WORKSHOP PRACTICE

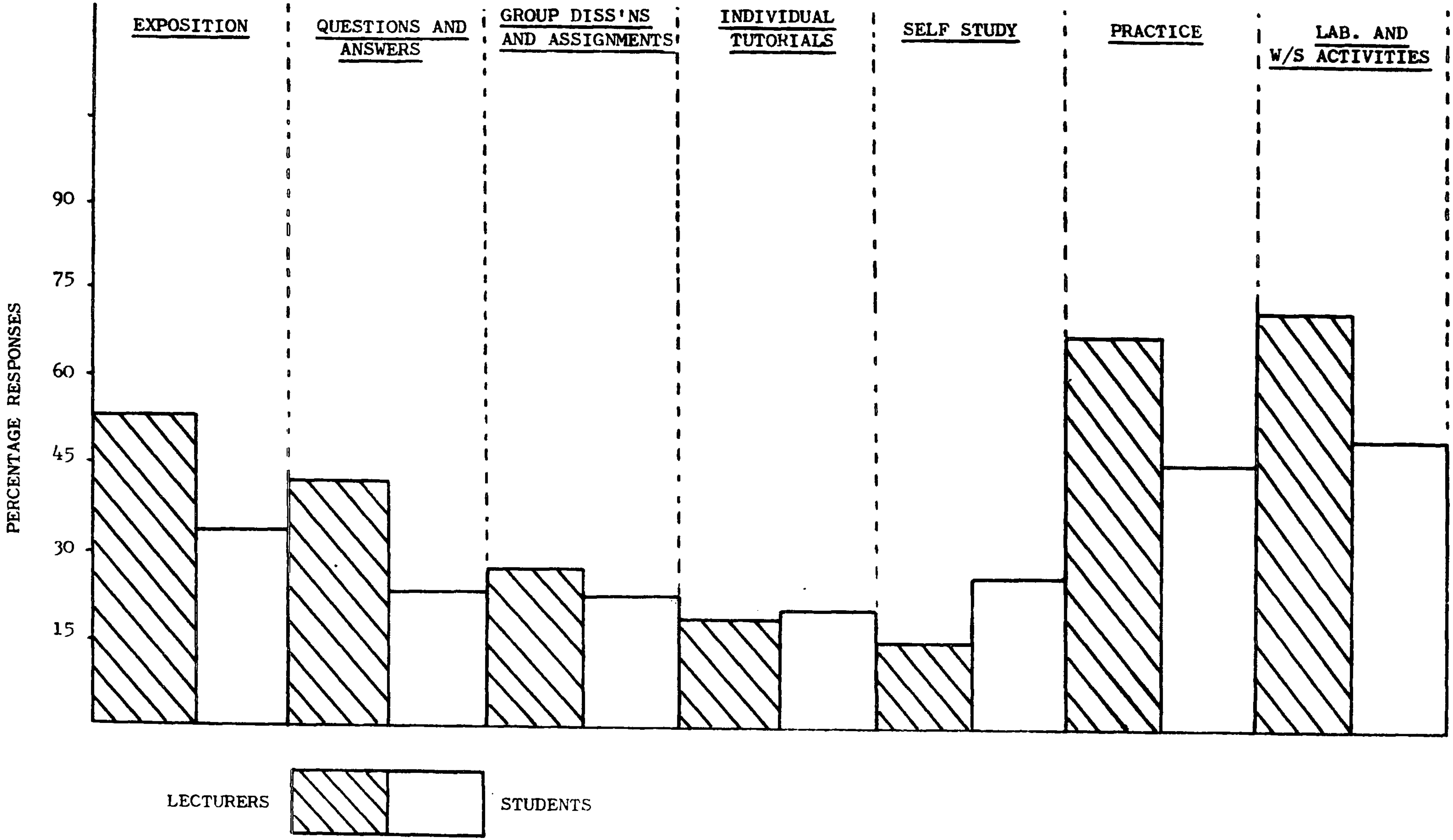
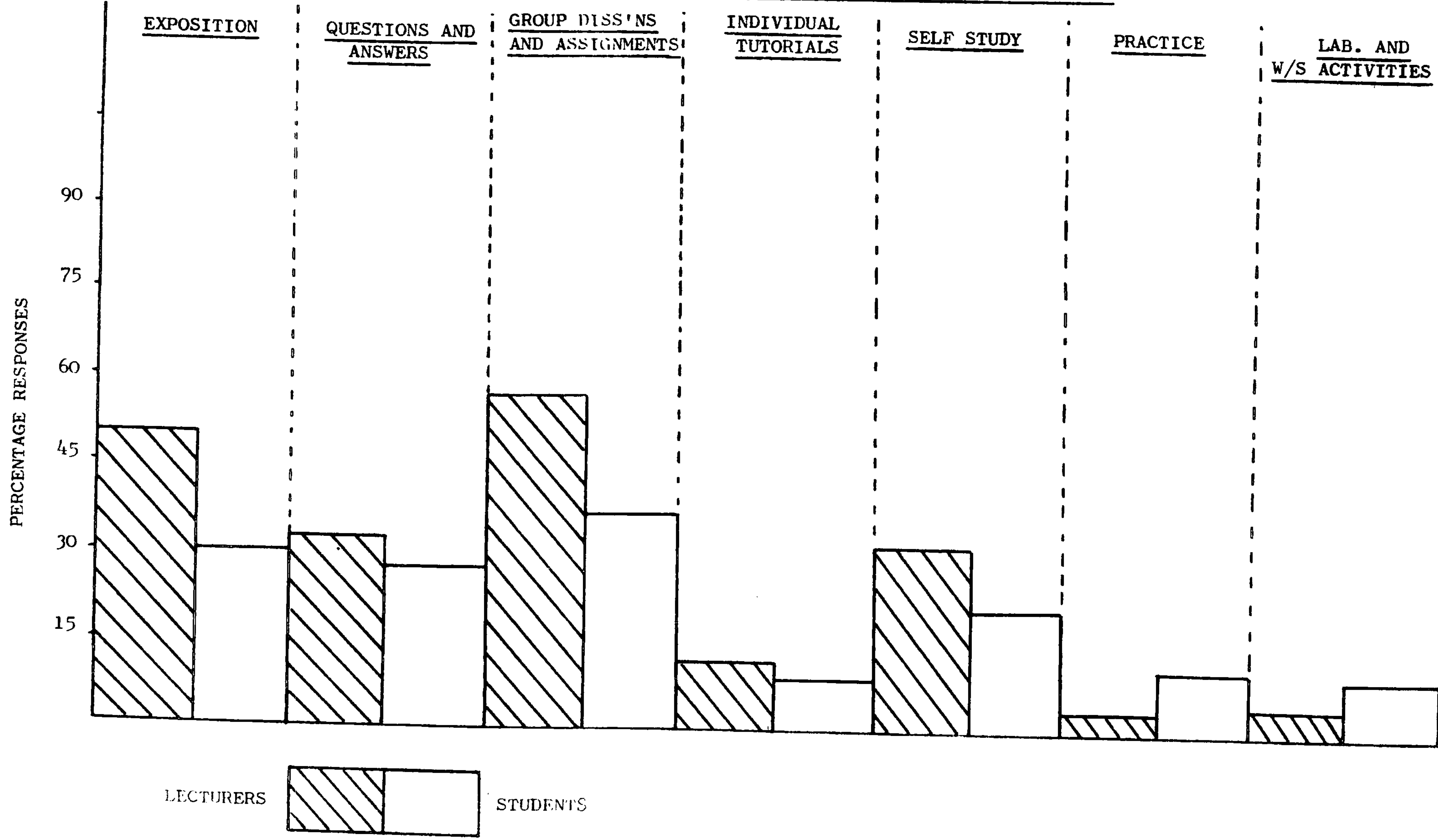


TABLE 10.36 CHOICE OF ASSEMBLY OF NOTES/INFORMATION RELATING TO INDUSTRIAL STUDIES



10.4 INTEREST OF SUBJECT

1) (116)(69)

In the main, students found the subject of 'technology' quite interesting to a high level of agreement. The exception to this was the craft students under 18 who surprisingly thought 'technology' interesting to a far lesser degree. Lecturers themselves expected all students to find 'technology' as a subject more interesting than students indicated.

2) (117)(70)*

Students, in response to the question on how interesting they found 'science' as a subject, answered just left of centre indicating a certain neutrality and uncertainty as to how to answer. The lecturers indicated that they thought technician students would answer in this way, but they thought craft students would consider 'science' as a subject uninteresting. In actual fact the group scoring the lowest mean on the interest scale was the craft students over 18 followed by the craft students under 18 with means of 2.553 and 2.585 respectively. The craft students under 18 had high levels of agreement on their opinion scale, the remaining groups having on average a much lower level of agreement.

Lecturers mean and standard deviation in response to their ideas or opinions of technicians were MEAN = 2.7 STANDARD DEVIATION = 1.328.

3) (118)(71) *

When asked 'as a subject, how interesting do you find 'mathematics'?, all students reacted by scoring a mean of approximately 3, indicating uncertainty as to whether they find mathematics interesting or uninteresting. As far as technician students were concerned lecturers anticipated this response, but thought craft students would be quite uninterested.

Lecturers, when anticipating technician students, scored a mean of 3.128 and a standard deviation of 1.107.

4) (119)(72)

Students found the subject of 'workshop practice' interesting to quite a high level of agreement. The lecturers also agreed amongst themselves that students would respond this way.

5) (120)(73)

Craft under 18 students, in response to the question on how interesting as a subject they found industrial/general studies, said that they found this subject interesting to a comparatively low level. The remaining three groups of students had a tendency to neutrality when replying to this question. The lecturers thought the students would respond by saying they disliked the subject of industrial/general studies. All groups had a wide spread of individual scores.

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	116	69	65	2.457	1.107	+
CRAFT OVER 18				2.138	1.067	++
TECH UNDER 18				1.734	0.980	+++
TECH OVER 18				1.606	0.913	+++
LECTURERS				1.567	0.699	+++
CRAFT UNDER 18	117	70	66	2.585	0.915	+++
CRAFT OVER 18				2.553	1.181	+
TECH UNDER 18				2.702	1.210	-
TECH OVER 18				2.734	1.430	-
LECTURERS *				3.662	1.093	++
CRAFT UNDER 18	118	71	67	3.021	1.360	-
CRAFT OVER 18				3.265	1.377	-
TECH UNDER 18				2.946	1.283	-
TECH OVER 18				2.872	1.306	-
LECTURERS *				4.310	0.884	+++

TABLE 10.37

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	119	72	68	1.819	0.933	+++
CRAFT OVER 18				1.691	1.010	++
TECH UNDER 18				1.606	0.925	+++
TECH OVER 18				1.829	0.963	+++
LECTURERS				1.972	1.114	+
CRAFT UNDER 18	120	73	69	2.265	1.131	+
CRAFT OVER 18				2.691	1.329	-
TECH UNDER 18				2.904	1.422	-
TECH OVER 18				2.882	1.351	-
LECTURERS				3.891	1.214	-
CRAFT UNDER 18						
CRAFT OVER 18						
TECH UNDER 18						
TECH OVER 18						
LECTURERS						

TABLE 10.37 CONTINUED

10.5 IMPORTANCE OF COURSE SUBJECT TO JOB

1) (96)(49)

Craft students under 18 were the most positive of all student groups and thought to a low level of agreement that all the topics covered on their course were relevant to their jobs. The technician students under 18 answered left of centre, whilst the remaining two groups of students had leanings towards disagreement with the statement. Again lecturers thought all students would disagree to a stronger level than they actually did.

2) (121)(74)

To the question 'as a subject, how important is technology to students in their jobs?', lecturers anticipated the students' opinions on the matter when they said students think technology is important to their jobs. All groups agreed to a high level on the opinion scale, except the craft under 18 students who only achieved a standard deviation of 1.247 and a mean of 2.617 which indicated a wide spread of scores and a leaning towards uncertainty on this question.

3) (122)(75) *

Students responded to the question on the importance of 'science' as a subject to them in their job, with neutrality, the technician group under 18 being the most positive with a mean of 2.436 and a standard deviation of 1.172. Lecturers thought that technicians would answer with neutrality to this question and thought that craft students would think 'science' was unimportant to them in their job.

4) (123)(76) *

In response to the question 'how important is mathematics to you in your job?', students answered with uncertainty. Lecturers on the other hand thought that technician students would think mathematics unimportant to them in their job and craft students would think mathematics unimportant to a greater degree than technicians.

The lecturers, when anticipating technician students responses, scored a mean of 3.728 and a standard deviation of 1.094.

5) (124)(77)

All groups responded to a high level of agreement to the question 'as a student, how important is workshop practice to you in your job?' students thinking, as lecturers predicted, that workshop practice is quite important to them and their job.

6) (125)(78)

To the question 'as a subject, how important is industrial/general studies to you in your job?', only the craft students scored left of centre to this question, all other groups thought industrial/general studies unimportant to varying degrees, but not as unimportant as lecturers thought they would.

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	96	49	45	2.372	1.414	-
CRAFT OVER 18				3.308	1.501	-
TECH UNDER 18				2.840	1.381	-
TECH OVER 18				3.414	1.379	-
LECTURERS				3.905	1.129	+
CRAFT UNDER 18	121	74	70	2.617	1.247	-
CRAFT OVER 18				1.755	0.985	+++
TECH UNDER 18				1.414	0.749	+++
TECH OVER 18				1.382	0.773	+++
LECTURERS				1.527	0.774	+++
CRAFT UNDER 18	122	75	71	2.819	1.100	+
CRAFT OVER 18				2.914	1.301	-
TECH UNDER 18				2.436	1.172	+
TECH OVER 18				3	1.254	-
LECTURERS *				3.972	1.077	++

TABLE 10.38

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	123	76	72	2.734	1.140	+
CRAFT OVER 18				3.148	1.336	-
TECH UNDER 18				2.531	1.334	-
TECH OVER 18				3.244	1.243	-
LECTURERS *				4.445	0.807	+++
CRAFT UNDER 18	124	77	73	1.851	0.988	+++
CRAFT OVER 18				1.510	1.007	++
TECH UNDER 18				1.287	0.662	+++
TECH OVER 18				1.521	0.871	+++
LECTURERS				1.729	0.889	+++
CRAFT UNDER 18	125	78	74	2.659	1.153	+
CRAFT OVER 18				3.319	1.369	-
TECH UNDER 18				3.148	1.336	-
TECH OVER 18				3.468	1.318	-
LECTURERS				4.243	0.983	+++

TABLE 10.38 CONTINUED

10.6 EXAMINATION SUCCESS AT COLLEGE

1) (135)(88)

Passing examinations tends to be quite important to students. The craft under 18 groups, although agreeing that it is important to pass examinations, did so at a considerably lower level than the other groups. The craft students under 18, as well as having the highest mean of the student groups, also showed the highest standard deviation, being the only group to show a low level of opinion agreement. Lecturers agreed that the students would think it important to pass examinations at college.

2) (136)(89)

In response to the statement 'passing my examination is important to me because it will give me personal satisfaction', students answered as expected by lecturers and agreed with the statement to a high level. The one group of students who were an exception to this was the craft under 18 who, although agreeing with the statement on average managed to score a high standard deviation.

3) (137)(90) *

Lecturers anticipated the response from craft students under 18 who agreed that passing their college examination is important to them because it will give them better career prospects. Lecturers also anticipated the response coming from technician students, these students thinking that it was more important than did craft students to pass their college examinations for career reasons.

Lecturers, when anticipating technician student responses, scored a mean of 1.6 and a standard deviation of 0.736.

4) (138)(91)

Lecturers thought it important to students to pass their college examination because it would please their parents. All students except the craft students under 18 thought it quite important to a high level of agreement. The craft under 18 students were much less positive in their responses which were on average approaching the neutral position indicating that this particular group were not concerned about pleasing their parents in this way.

5) (139)(92)

To the statement 'passing my college examination is important to me because it will please my employers', craft students replied as the lecturers expected by agreeing with it. The remaining three groups of students also agreed with the statement but much more positively and to a high level of agreement.

6) (140)(93) *

Students thought to a poor level of agreement that passing their college examination was important to them because the thought of failure frightened or concerned them. The lecturers thought that technician students would react in this way but anticipated that craft students would have reacted with a certain amount of neutrality, indicating that on average in their opinion craft students are generally less concerned than are technician students when it comes to passing examinations. This opinion in the main proved to be incorrect.

Lecturers, when anticipating technician student responses, scored a mean of 2.2 and a standard deviation of 1.153.

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	135	88	84	2.265	1.599	-
CRAFT OVER 18				1.414	0.791	+++
TECH UNDER 18				1.234	0.591	+++
TECH OVER 18				1.340	0.792	+++
LECTURERS				1.797	0.915	+++
CRAFT UNDER 18	136	89	85	2.170	1.534	-
CRAFT OVER 18				1.510	0.821	+++
TECH UNDER 18				1.531	0.821	+++
TECH OVER 18				1.5	0.919	+++
LECTURERS				1.729	0.843	+++
CRAFT UNDER 18	137	90	86	2.148	1.304	-
CRAFT OVER 18				1.553	0.882	+++
TECH UNDER 18				1.255	0.524	+++
TECH OVER 18				1.414	0.867	+++
LECTURERS *				1.972	0.884	+++

TABLE 10.39

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	138	91	87	2.468	1.411	-
CRAFT OVER 18				1.723	0.927	+++
TECH UNDER 18				1.478	0.754	+++
TECH OVER 18				1.542	0.846	+++
LECTURERS				2.108	1.047	++
CRAFT UNDER 18	139	92	88	2.191	1.178	+
CRAFT OVER 18				1.702	0.885	+++
TECH UNDER 18				1.361	0.649	+++
TECH OVER 18				1.773	0.993	+++
LECTURERS				2	1.102	+
CRAFT UNDER 18	140	93	89	2.265	1.247	-
CRAFT OVER 18				2.553	1.396	-
TECH UNDER 18				2.170	1.116	+
TECH OVER 18				2.340	1.259	-
LECTURERS *				2.716	1.810	-

TABLE 10.39 CONTINUED

7) (141)

Overall 82 out of a possible 188, representing 44% of all the craft students, said that the thought of examination failure frightened or concerned them. Slightly higher figures were indicated by the technician groups, these being 102 out of a possible 188 equalling 54% having concern at the thought of examination failure.

Of those students who said that they were frightened the reasons given and the significance of the reasons are given in the following table.

TABLE 10.40

	N = 39	N = 43	N = 53	N = 49
REASON GIVEN	Craft under 18 Years	Craft over 18 Years	Tech. under 18 Years	Tech. over 18 Years
Reduced career prospects	23%	14%	13%	27%
Waste of time	23%	26%	11%	29%
Would loose job	21%	35%	42%	18%
Let himself down	10%	16%	17%	20%
Let employer down	8%	9%	9%	2%
Everyone disappointed	10%		2%	2%
Lack of progress			4%	2%
Would let parents down	5%		2%	

It would seem that the most frightening reason or cause for concern was the fact that failure in their college examinations would lead to the student losing his job. The next significant reason given was that having done the course to have failed would have been a waste of time; this reason was backed-up by the suggestion that failure in examinations would lessen career prospects.

8) (142)

Students were asked whether passing their college examinations was important to them and to give the reasons for their attitudes. In answering the previous question 184 students out of a possible 376 had said examination failure concerned them, leaving 192 students who were possibly unconcerned about examination failure. Out of this possible 192 students only 21 admitted this unconcern and gave their reasons as:-

1) CRAFT STUDENTS UNDER 18 YEARS OF AGE:- Only three students responded to this question, the reasons given were:-

   (a) 'Don't like examinations or reading books.'

   (b) 'There's always another time.'

   (c) 'If you fail you fail and you'll have to try again.'

2) CRAFT STUDENTS OVER 18 YEARS OF AGE:- Nine students responded in this group, the reasons given were:-

   (a) 'You can sit them again in January'

   (b) 'It will not affect my ability to do the job'

   (c) 'It's not the end of the world'

   (d) 'I will not lose my job'

   (e) 'Because I think they are a waste of time'

   (f) 'Because I've already got a job'

   (g) 'I'll still keep my job if I fail'

   (h) 'I want to emigrate'

   (i) 'The job's not important to me'.

3) TECHNICIAN STUDENTS UNDER 18 YEAR OF AGE:- Five students responded as follows:-

   (a) 'Because it's boring work'

   (b) 'Because at our garage you don't need exams'

   (c) 'There's nothing I can do about it if I fail'

   (d) 'I couldn't be bothered'

   (e) 'If I fail, I fail'.

4) TECHNICIAN STUDENTS OVER 18 YEARS OF AGE:- Four students responded as follows:-

(a) 'I don't rely on my exams'

(b) 'I'm not scared to fail'

(c) 'My job will still be safe'

(d) 'I get sick of exams'.

CHAPTER 11

SEQUENCING OF TOPICS

Students, when responding to their questionnaire, expressed the view that it is important for the lecturer to present related topics of the syllabus in a clear and natural order. It was also obvious from discussions with lecturers that they too considered correct sequencing of topics within a syllabus of paramount importance. For the purpose of deciding upon topic precedence it was thought by all concerned that the methods proposed by Williamson and Reece (1975) were suitable for this purpose. They advocate the use of 'topic precedence algorithms', the purpose of which is to make, by the use of diagrams, a model which can be used to show the most effective presentation of a course or topics and also, by its use, provide answers to the many problems encountered when planning a course.

THE PRODUCTION OF A TOPIC PRECEDENCE ALGORITHM

A summary of the seven steps to the production of a topic precedence diagram as depicted by Williamson and Reece(1975) are as follows:-

1) In step one the course planner must, after considering past experiences of the course, and after consultation with other teachers list all the topics that are present within the subject being considered.

2) The topics are now considered individually using a system of randomly numbered cards, the numbered order of the topics having now no resemblance to the original syllabus. The aim of this is to enable comparison of topics without being influenced by the order presented in the syllabus.

3) To help the planner make a decision which of two topics i.e. 'A' or 'B' should be taught or presented first, the use of an algorithm is advocated.

4) The precedence algorithm is again used when a third topic is introduced, precedence of the new topic 'C' being compared to topic 'A' or 'B' whichever had the greater precedence.

5) The construction of the T.P.D. is now commenced, bearing in mind that topics may have to be moved around and orders changed as new topics are introduced.

6) As a new topic is introduced, i.e. 'D' it is compared with topics already displayed and therefore its relative precedence is determined. Comparisons in this way are made for all the topics within the subject in questions.

7) Now that the procedure for the construction of a T.P.D. has been experienced, the teacher will find that, with practice, the process will tend to become easier and quicker.

<u>THE TOPIC PRECEDENCE DIAGRAM MAY BE USED TO LOCATE, INDICATE OR PRODUCE THE FOLLOWING</u>

1. All possible teaching starting points
2. All possible teaching finishing points.
3. Points of convergence and divergence.
4. Topics that are unrelated.
5. A 'centrality index'.
6. The most suitable times for testing and assessment.
7. The most suitable times for revision.
8. The most suitable teaching methods.
9. Resources available.
10. Linear models.
11. Range charts.
12. Optimum linear models.

RESULTING T.P.D.

Following the advocated procedure for the production of a T.P.D. ten topics within a syllabus scheme could take the form as depicted in diagram 11.2.

POSITION RANGE CHART

TABLE 11.1

TOPIC NO.	EARLIEST COLUMN POSITION	LATEST COLUMN POSITION	POSITION RANGE FLOAT
1	1	1	0
2	2	2	0
3	3	3	0
4	4	7	3
5	5	8	3
6	4	6	2
7	5	7	2
8	6	8	2
9	9	9	0
10	10	10	0

The usefulness of a kowledge of range is increased when column positions are replaced by actual teaching times. There may be occasions when, for multiplicity of demand, certain resources are over or under utilised. Under such circumstances movement of topics within the boundaries of the range enables resource demand to be smoothed.

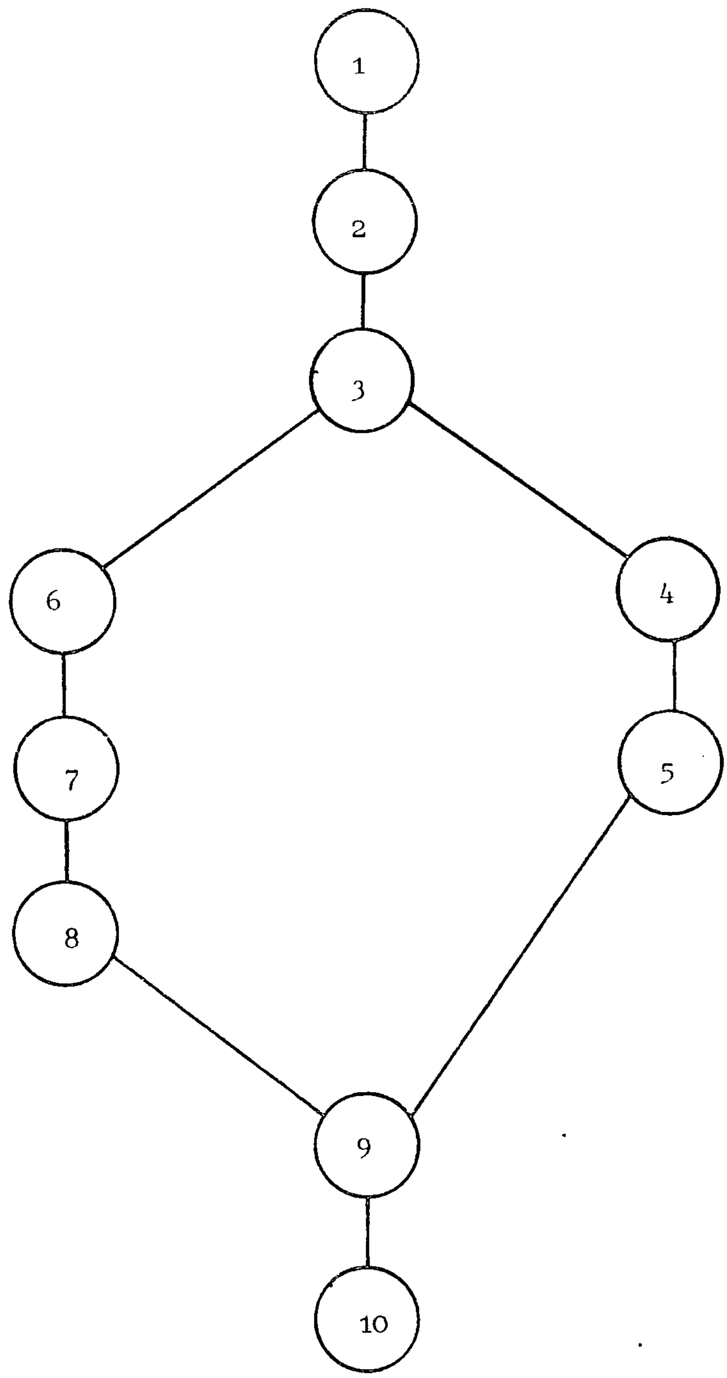


TABLE 11.2

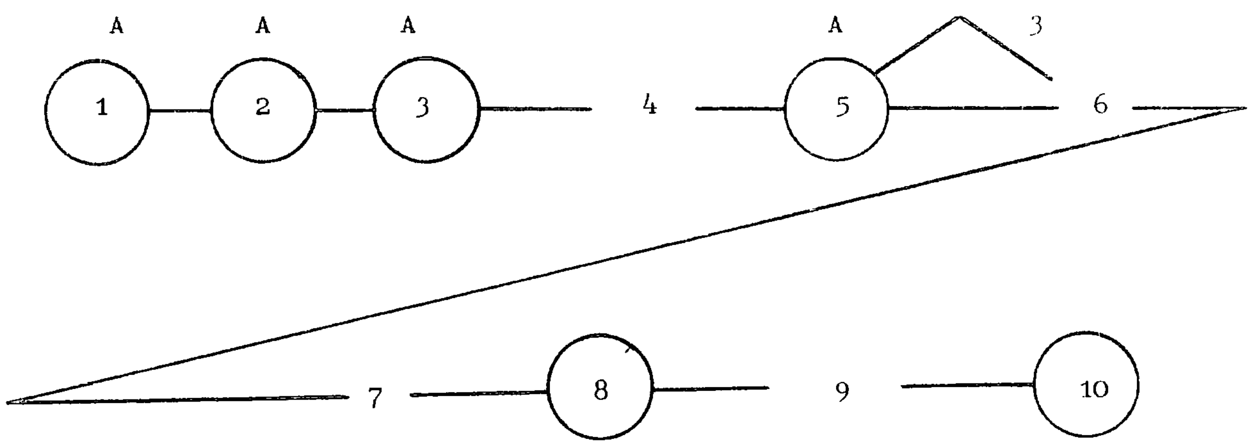
LINEAR FLOW

1	2	3	4	5	6	7	8	9	10

OR

1	2	3	6	7	8	4	5	9	10

LINEAR FLOW MODELS SHOWING ASSESSMENT AND REVISION TIMES



OR

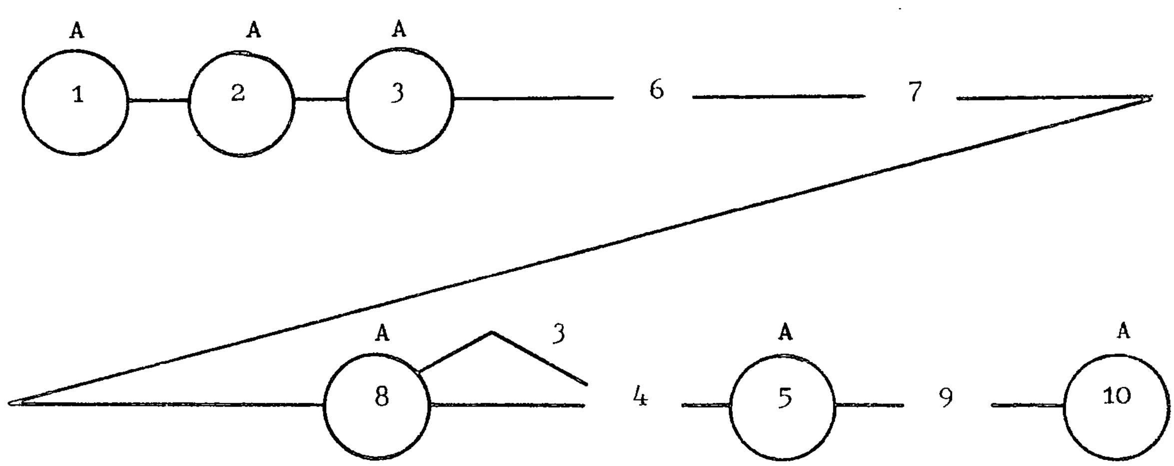


TABLE 11.3

	1	2	3	4	5	6	7	8	9	10	Pi	CI
1	0	1	2	3	4	3	4	5	5	6	33	7.3
2	1	0	1	2	3	2	3	4	4	5	25	9.6
3	2	1	0	1	2	1	2	3	3	4	19	12.7
4	3	2	1	0	1	2	3	3	2	3	20	12.1
5	4	3	2	1	0	3	3	2	1	2	21	11.5
6	3	2	1	2	3	0	1	2	3	4	21	11.5
7	4	3	2	3	4	1	0	1	2	3	23	10.5
8	5	4	3	4	5	2	1	0	1	2	27	8.9
9	5	4	3	2	1	3	2	1	0	1	22	11
10	6	5	4	3	2	4	3	2	1	0	30	8

TABLE 11.4

Pi = 241

CI = 103.1

MEAN = 10.31

The centrality index, when calculated for each topic, shows numerically how one topic is joined to each of the others. The higher the index for an individual topic the more central is that topic compared with the others and therefore the more likely it is to have an influence on most of the other topics.

CHAPTER 12

JOBS AND EMPLOYMENT

1) (52)(5)

In reply to the statement 'I think I am lucky because many people would consider my job as more of a hobby' the only student group to answer positively was the craft under 18, which scored just left of centre. The remaining groups of students answered with a mean just right of centre as the lecturers agreed they would. All groups had a tendency to be uncertain when answering this statement, the standard deviation figures indicating poor levels of agreement.

2) (53)(6)

To their statement 'students think their jobs are unpleasant' lecturers anticipated the craft under 18 replies which were neutral, these students having mixed feelings as shown by a standard deviation of 1.625. The remaining three groups of students disagreed with the statement and did not think their job unpleasant.

3) (54)(7)

Students were undecided on the question of whether they enjoyed doing their job as much as they enjoyed their leisure time. On average the students mean came out just left of centre but with a poor level of agreement. Lecturers thought, to a reasonable level of agreement, that students would enjoy their leisure time more that they did their jobs.

4) (55)(8)

Students showed that they were uncertain whether their friends envied them their jobs, this reaction being as expected by lecturers who thought that students would probably have leanings to the right and tend to think that friends did not envy them their jobs. This was true in the case of both the older groups of students.

5) (56)(9)

To the statement 'I consider my work to be interesting' it is quite clear from the results that all groups of students think that their work is interesting. Lecturers also agreed that students would find their work interesting, but not as interesting as students actually found it.

6) (57)(10)

Students answered positively and said that they were satisfied with their jobs. Lecturers thought that all students would respond by placing their replies in the neutral position, neither being satisfied nor dissatisfied with their jobs.

7) (58)(11)

To the statement 'I consider my job to be boring' the craft students under 18 showed a certain inconsistency, there being approximately as many agreeing as disagreeing with the statement. The remaining groups of students disagreed with the statement to a higher level of agreement than was expected by the lecturers.

8) (59)(12)

Craft students under 18 and both groups of technicians tended to agree to a high level that they enjoyed their jobs more than the average worker. The craft over 18 answered on the positive side of neutral at a slightly lower mean than lecturers expected.

9) (60)(13)

To the statement 'my work gives me real enjoyment' again all groups of students, to quite a high level, agreed that their work did give them real enjoyment. Lecturers, also to a high level of agreement on the opinion scale, thought that students would be undecided on this matter and answered on average in the neutral position.

10) (61)(14)

Lecturers thought that students in general would be undecided if they were given the choice of staying at home or going to work. The craft students under 18 were of this opinion, but the craft over 18 group and the two technician groups were of the opinion that they would rather be at work than stay at home.

11) (62)(15)

Lecturers thought that getting well paid for his work was the most important factor to a student. The only groups approaching the lecturers' opinion were the craft under 18. All the three remaining groups of students indicated from their responses that they were a little uncertain about this question and could not decide which is the most important aspect of their job.

12) (63)(16)

Lecturers did not respond as positively as students when asked if students like their day at work to be very busy. Students, to generally a moderate level of agreement, wanted their day at work to be busy. The nearest groups responding as lecturers anticipated were the craft under 18 with a mean of 2.372 and a standard deviation of 1.071.

13) (64)(17)

To the statement 'I would like to stay in the motor trade but am keen for a change of employment', all groups were generally neutral in their response, the technician under 18 group having a slight leaning to the right. Lecturers thought, to a high level of agreement, that students' opinions would fall just left of centre showing a slight leaning towards agreeing that they were looking for a change of firm.

14) (65)(18)

Lecturers thought to a high level of agreement that students think that they are used as a source of cheap labour. The students' views however were less positive with a leaning towards neutrality. The only group of students in any way reacting as lecturers anticipated were the craft students over 18, who returned a mean of 2.202 compared with the lecturers' mean of 1.756.

15) (66)(19)

To the statement 'I generally feel very enthusiastic about my job' the craft group over 18 and both groups of technicians agreed that they were enthusiastic about their jobs. The lecturers accurately anticipated the craft group under 18 whose responses indicated uncertainty on this matter.

16) (67)(20)

Students in the main agree that when they chose their job, money was not the main consideration. Lecturers indicated that they thought students would be undecided how to answer this question not being able to evaluate the importance of money when they started with their firm.

17) (68)(21)

To the statement 'students feel that their jobs are secure and there isn't much chance of redundancy' lecturers again thought that students would be unable to make a decision in either direction, whereas in actual fact students were of the opinion that their jobs were secure and there was little likelihood of redundancy.

18) (69)(22) *

Lecturers, when asked if they thought students look forward to the day when they will be in a position of responsibility at the firm where they work, answered both for technicians and craft students. They thought that craft students would be undecided on this matter, not being able to decide if they want responsibility, but thought the technicians would be looking forward to responsibility at their firms. The students themselves quite strongly said that they were looking forward to responsibility the exception to this being the craft over 18 group who returned a mean of 2.457. Lecturers anticipated responses from technician students as mean 2.242 and standard deviation 1.139.

19) (70)(23)

The student groups on average disagreed that at the present time they are looking for a complete change of employment away from the motor/ transport trade. The lowest mean came from the craft under 18 groups, this was 3.234 and was compatible with the lecturers' responses on students' opinions.

20) (71)(24) *

The technician students under 18 , to a greater degree than the other student groups, agreed that they received encouragement from their employers to do well at their college studies. Lecturers themselves thought that technician students would consider that they received more encouragement than did craft students, anticipating replies from technicians being mean 2.414 and standard deviation 1.259

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	52	5	1	2.670	1.553	-
CRAFT OVER 18				3.319	1.256	-
TECH UNDER 18				3.234	1.241	-
TECH OVER 18				3.191	1.346	-
LECTURERS				3.513	1.141	+
CRAFT UNDER 18	53	6	2	2.925	1.625	-
CRAFT OVER 18				3.861	1.163	+
TECH UNDER 18				4.361	0.861	+++
TECH OVER 18				3.808	1.187	+
LECTURERS				3	1.127	+
CRAFT UNDER 18	54	7	3	2.797	1.540	-
CRAFT OVER 18				3.031	1.454	-
TECH UNDER 18				2.638	1.270	-
TECH OVER 18				2.808	1.240	-
LECTURERS				4.013	1.006	++

TABLE 12.1

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	55	8	4	2.606	1.385	-
CRAFT OVER 18				3.568	1.207	-
TECH UNDER 18				2.914	1.097	++
TECH OVER 18				3.191	1.132	+
LECTURERS				3.405	1.126	+
CRAFT UNDER 18	56	9	5	2.361	1.201	-
CRAFT OVER 18				1.861	0.985	+++
TECH UNDER 18				1.510	0.847	+++
TECH OVER 18				1.691	0.899	+++
LECTURERS				2.513	0.989	+++
CRAFT UNDER 18	57	10	6	1.989	1.189	+
CRAFT OVER 18				2.170	1.181	+
TECH UNDER 18				1.670	0.902	+++
TECH OVER 18				2.053	1.075	++
LECTURERS				3.027	1.026	++

TABLE 12.1 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	58	11	7	2.946	1.770	-
CRAFT OVER 18				4.031	1.197	+
TECH UNDER 18				4.414	0.904	+++
TECH OVER 18				4.308	0.959	+++
LECTURERS				3.310	1.138	+
CRAFT UNDER 18	59	12	8	2.180	1.081	++
CRAFT OVER 18				2.606	1.074	++
TECH UNDER 18				2.351	1.038	++
TECH OVER 18				2.234	0.843	+++
LECTURERS				2.864	0.934	+++
CRAFT UNDER 18	60	13	9	2.148	0.812	+++
CRAFT OVER 18				2.5	1.089	++
TECH UNDER 18				2.255	1.041	++
TECH OVER 18				2.372	0.945	+++
LECTURERS				2.932	0.990	+++

TABLE 12.1 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	61	14	10	3.170	1.456	-
CRAFT OVER 18				3.555	1.402	-
TECH UNDER 18				4.191	1.151	+
TECH OVER 18				4	1.360	-
LECTURERS				2.837	1.365	-
CRAFT UNDER 18	62	15	11	2.755	1.208	-
CRAFT OVER 18				2.329	1.249	-
TECH UNDER 18				2.723	1.307	-
TECH OVER 18				2.925	1.393	-
LECTURERS				1.972	0.929	+++
CRAFT UNDER 18	63	16	12	2.372	1.071	++
CRAFT OVER 18				2	1	+++
TECH UNDER 18				2.170	1.163	+
TECH OVER 18				1.914	1.038	++
LECTURERS				2.594	1.101	+

TABLE 12.1 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	64	17	13	3.148	1.480	-
CRAFT OVER 18				3.010	1.491	-
TECH UNDER 18				3.542	1.251	-
TECH OVER 18				2.723	1.454	-
LECTURERS				2.621	0.925	+++
CRAFT UNDER 18	65	18	14	2.648	1.441	-
CRAFT OVER 18				2.202	1.350	-
TECH UNDER 18				2.712	1.491	-
TECH OVER 18				2.5	1.404	-
LECTURERS				1.756	0.851	+++
CRAFT UNDER 18	66	19	15	2.712	1.145	+
CRAFT OVER 18				2.351	1.038	++
TECH UNDER 18				2.074	1.002	++
TECH OVER 18				2.127	0.947	+++
LECTURERS				2.770	0.993	+++

TABLE 12.1 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	67	20	16	2.308	1.421	-
CRAFT OVER 18				2.106	1.124	+
TECH UNDER 18				1.893	1.004	++
TECH OVER 18				1.819	1.051	++
LECTURERS				2.797	1.230	-
CRAFT UNDER 18	68	21	17	1.936	1.146	+
CRAFT OVER 18				2.117	1.253	-
TECH UNDER 18				2.042	1.219	-
TECH OVER 18				1.893	1.134	+
LECTURERS				3.094	1.275	-
CRAFT UNDER 18	69	22	18	1.819	1.254	-
CRAFT OVER 18				2.457	1.301	-
TECH UNDER 18				1.680	0.827	+++
TECH OVER 18				2.074	1.103	+
LECTURERS *				3.081	0.940	+++

TABLE 12.1 CONTINUED

REPORT ORDER	NUMBER AS IT APPEARS IN STUDENTS QUESTIONNAIRE	NUMBER AS IT APPEARS IN LECTURERS QUESTIONNAIRE	NUMBER AS IT APPEARS IN THE INDEX (FOR BOTH STUDENTS AND LECTURERS)	MEAN	STANDARD DEVIATION	LEVEL OF AGREEMENT
CRAFT UNDER 18	70	23	19	3.234	1.678	-
CRAFT OVER 18				4.212	1.100	+
TECH UNDER 18				4.617	0.876	+++
TECH OVER 18				4.297	1.109	+
LECTURERS				3.243	1.100	+
CRAFT UNDER 18	71	24	20	2.595	1.378	-
CRAFT OVER 18				2.617	1.516	-
TECH UNDER 18				2.170	1.126	+
TECH OVER 18				2.510	1.471	-
LECTURERS *				2.878	1.184	+
CRAFT UNDER 18						
CRAFT OVER 18						
TECH UNDER 18						
TECH OVER 18						
LECTURERS						

TABLE 12.1 CONTINUED

21) (29)

Students were asked to specify the exact title of their job, i.e. apprentice motor mechanic, apprentice motor vehicle technician etc. All students took their job title from the actual course they attended at the college. If a student was on a craft course he called himself an apprentice motor mechanic, or if he was on a technician course he called himself an apprentice motor vehicle technician. This was an interesting point because students who were employed by the same firm, doing the same job and had been engaged on the same terms, in some cases referred to themselves differently, the only difference being the nature of the course that the college selected for each.

22) (30-34)

In this area of the questionnaire, students were asked to specify details of any previous full-time employment and to also give the reasons for leaving.

Tables 12.2 to 12.5 give the details of all other jobs the students had previously held.

It is interesting to note that there were 43 craft students compared with only 27 technician students who had previous jobs. Taking all students together, there was a total of 70 students out of a possible 376 students equalling 18.6% who had previous employment.

CRAFT STUDENTS UNDER 18 YEARS OF AGE

In this group 20 students listed one previous job, and two students listed two previaus jobs.

TABLE 12.2

TITLE OF JOB	REASONS FOR LEAVING
JOINER	Low pay - long hours
LABOURER	Got job as motor mechanic
QUARRY WORKER	Very long hours
MACHINE OPERATOR	Boring
LABOURER	Temporary job
MECHANIC	Wanted to
FARM WORKER	Too tiring
TYRE FITTER	Sacked
CARPET FITTER	Sacked
LOADING WAGGONS	Temporary job
FARMER	Wanted to learn a trade
STOCKING SHELVES	Boring
FABRICATOR	Moved house
PANEL BEATER	Wanted more money
LIGHTING INSTALLER	Can't stand heights
App. TECHNICIAN	Boring
FARM WORKER }	Got sick of it
FORESTER }	Got sick of it
HEAD PORTER	Sacked
TRAINEER MECHANIC	Not enough organisation
LABOURER	No future
HOTEL HELPER	Moved back to England
LABOURER }	Sick of it
HEATER INSTALLER }	Sacked

<u>CRAFT STUDENTS OVER 18 YEARS OF AGE.</u> In this group 17 students listed one other job. Two listed two other jobs and two listed three other jobs.

TABLE 12.3

TITLE OF JOB	REASONS FOR LEAVING
Paint Sprayer	Boring/low pay
Coalman	To start apprenticeship
Labourer	Did not like job
Van lad	Moved house
Labourer	Better opportunities as motor mechanic
Shop assistant	Sacked
Gardener	Left to join R.A.F.
Shop assistant	Worked until I got job I wanted
App. Insulating Engineer	Away from home
App. Panel Beater	Too badly paid
App. Paint Sprayer	Didn't get on with foreman
Gardener	Apprenticeship available
Structural Engineer	Future no good
Painter and Decorator	Panel Beating job came along
Labourer	Got apprenticeship
Factory worker	Wanted apprenticeship
Farm hand	Got job as motor mechanic
Motor Mechanic	Not working hard enough
Machine operator	Moved house
Office boy	Didn't like being stuck in an office
Panel Beater and Paint Sprayer	To broaden my knowledge
Mechanic in Navy	Time up
H.G.V. Fitter	Poor working conditions
Plumber	Conditions of work
App. Motor Mechanic	Got sick of it
Parts Salesman	More prospects
Salesman	No opportunities

TECHNICIAN STUDENTS UNDER 18 YEARS OF AGE. In this group there were 11 students with one previous job and 2 students with 2 previous jobs.

TABLE 12.4

TITLE OF JOB	REASONS FOR LEAVING
Market Stall	To go to present job
Potter	Insecure future
Driver	To start as an apprentice
Bacon Boner	Change of apprenticeship
Job creation	New job
App. Motor Mechanic	Got the sack
App. Engineer	Not interested
Farm Worker	Too hard
Storeman	Wanted a trade
App. Plater	Fired
App. Paint Sprayer	No future
Labourer	Poor wages - no prospects - boring
Coalman	No future or qualifications
Farm Labourer	Started apprenticeship
Storeman	Got offer of apprenticeship

TECHNICIAN STUDENTS OVER 18 YEARS OF AGE. In this group there were 12 students with one previous job, 1 student with 2 previous jobs and one student with 3 previous jobs.

TABLE 12.5

TITLE OF JOB	REASONS FOR LEAVING
App. Watchmaker	Did not like it
Salesman	Didn't like indoor work
App. Bricklayer	Broke my leg
Mechanic	Did not like it
Labourer	Got job as apprentice fitter
App. Engineer	Hated it
Van Lad	Chance of apprenticeship
App. Ironmonger	Not interested
Labourer	Money situation - new job

TABLE 12.5 CONTINUED

TITLE OF JOB	REASONS FOR LEAVING
Motorbike Mechanic	No future
Motor Mechanic	Had disagreement with boss
Barman	Didn't like job or the hours
Farm Worker	Too filthy
Labourer	Got new job
Fitter and Turner	To better myself
App. Fitter	Made redundant
Diesel Fitter	Promotion

METHOD OF FINDING JOBS

23) (143 - 144)

When looking at the ways in which students actually got their jobs it is apparent from TABLE 12.6 that when one looks at the methods of 'through a relative' and 'through a friend/acquaintance at the firm in question' which for practical purposes can be said to be the same method, 162 students, representing the largest single group, secured a job in this way. The next most significant way in which students got their jobs was by 'calling/ringing unannounced at the firm in question', this accounting for 116 students and the third highest scoring method of getting a job was 'following an interview with a youth employment officer'.

The five most significant ways in which students found their jobs were:-

METHOD	PERCENTAGE OF STUDENTS GETTING JOB BY THIS MEANS
1) Through a relative Through a friend/acquaintance at the firm in question	43%
2) Calling/ringing unannounced at the firm in question	31%
3) Following an interview with a youth employment officer	17%
4) Through an advertisement	12%
5) Through the careers master at school	10%

HOW STUDENTS GOT THEIR JOBS

TABLE 12.6

METHOD OF GETTING JOB	CRAFT UNDER 18	CRAFT OVER 18	TECH. UNDER 18	TECH. OVER 18
Following an interview with a youth employment officer	17	16	20	10
Following an interview at the local technical college	1		1	1
Through the careers master at school	9	14	8	5
Through a relative	27	26	18	15
Through an advertisement	6	8	10	20
Through a friend/acquaintance at the firm in question	28	14	20	14
By calling/ringing unannounced at the firm in question	27	29	25	35
Other means				
Through a teacher	1			
Wrote to firm to see if there were any vacancies		5	2	2
Through work experience/job creation scheme	2	3	3	1
Progressed from part-time employment with firm		1		1
By attending a group training scheme (R.J.I.T.B.)			3	2

24) (145)

When asked to state the title of the person who interviewed them at their present firm prior to engagement, 286 students out of a possible 376 indicated that they received an interview, the remaining 90 students did not answer this question and therefore gave the impression that they had perhaps not even had an interview. This of course could be true because there were a total of 162 students who got their job through someone they knew at the firm in question and could have got the job solely on the strength of that.

Of those students interviewed the most likely person at the firm to carry out the interview was the workshop/service manager/manageress. Interviews carried out by these categories of people accounted for 52% of all interviews. The next highest score was interviews carried out by the owner of the firm which accounted for 20% of interviews given. The interviews carried out by a Director of the company, who incidentally could also be the owner, accounted for 6% of interviews and coming well down the list were interviews carried out by personnel officers which also accounted for 6% of the total. The reason for this is probably the fact that many garages are small firms and would not employ a person who is specifically a personnel officer, personnel duties in many garages being undertaken by the technical or general managerial staff.

25) (146 - 147)

Only 32% of all students said they received a pre-employment test. The tests listed by students and relative numbers are indicated in table 12.8. The most popular type of test is the 'written general knowledge' test accounting for 47% of those tested followed by 'aptitude tests' which accounted for 34% of those tested.

PERSONS MENTIONED AS THOSE WHO CARRIED OUT INTERVIEWS PRIOR TO EMPLOYMENT OF STUDENTS

TABLE 12.7

TITLE	CRAFT UNDER 18	CRAFT OVER 18	TECH. UNDER 18	TECH. OVER 18
Owner	14	17	11	16
Director	6	1	3	8
Manager/ess	19	8	14	12
Workshop/Service Manager	15	33	28	21
Personnel Officer	1	4	1	10
Foreman	3	3	2	
Careers Officer	1			
Department Manager	7	2	2	1
Apprentice Supervisor			6	
Apprentice Board			1	
Commanding Officer			3	2
Area/Fleet Engineer		6		2
Supervisor		1		2

TABLE 12.8

	NO. OF STUDENTS RECEIVING TEST N=121			
TYPE OF TEST	CRAFT UNDER 18	CRAFT OVER 18	TECH. UNDER 18	TECH. OVER 18
Written General Knowledge	5	25	13	14
Oral Test	2			
Aptitude Test	1	7	14	19
R.T.I.T.B. Test	2	4	3	2
Mechanical Test	1	1	5	3

CHAPTER 13

GENERAL COMMENTS AND CONCLUSIONS ON FINDINGS

From the evidence obtained from the student questionnaire, it seems that the sons of fathers who are occupied in intermediate administration, professional or managerial jobs are more likely to have been selected to attend a technician's course at the technical college. To obtain a position on a technician's course, a prospective student must satisfy the college of his ability to cope with mathematics, the mathematical content being the main difference between a technician's course and a craftman's course. The question then arises as to whether the students coming from the higher social class background receive more encouragement from their parents to do well at school and gain qualifications than do the students coming from the lower social classes. Venables (1974) found that the ability (and in some cases the motivation) of students from a high social status background when compared with students who came from the lower social groups is often exactly opposite to that which family background would at first suggest. In the case of the motor vehicle students who were selected for technician courses and whose parents had the more frequent incidence of a higher social class, this was not the case. As Venables suggested, it would be natural to assume that the fathers from higher social levels would in the main have higher and better qualifications and the expectations would be that this environment would produce better academic results.

In actual fact, in this study, although the technician students did come from a marginally higher social background, their parents had fewer qualification on average than the parents of craft students. The brothers and sisters of technician students however were better qualified than their counterparts of the brothers and sisters of craft students. On investigation, it was found that a possible explanation for this apparent extra encouragement from fathers with managerial jobs was the parental attitude. As more than one technician student said when interviewed, their fathers had done quite well in business without being well-qualified but attributed their success to hard work and a great deal of luck over a long period of time. They felt that the haul to the top would have been much easier with the right qualifications. This attitude from fathers was not uncommon and it was apparent that this influenced the son's general attitutde to his studies and his general ambition to do well, both at college and at his job. On examination, it was seen that the technician students taking part in this study had almost 2.5 times more G.C.E. passes than their craft student counterparts. The only subject area in any examination where more passes were obtained by craft students than technician students was the subject of biology. It is also interesting to note that there were 37% more craft students than technician students who had previous full-time employment indicating that the type of person who can gain a place on a technician course has a tendency to be stable and satisfied with the initial employment choice of an apprenticeship in the motor industry.

COMMENTS ON CHOICE OF STUDENTS' PASTIMES

In Schools Council Enquiry No. 1 (1968) 15 year old school leavers were asked about their main spare time activities. The six most significant responses from these boys were (1) Watching television, listening to the radio (50%). (2) Playing outdoor games or sport, including swimming (43%). (3) Camping, walking, fishing (31%). (4) Playing indoor games and sport e.g. bowling, table tennis, skating (21%). (5) Just being with a group of friends and chatting (19%). (6) Going to the cinema (16%).

The six highest choices of hobbies/pastimes for all the under 18 years of age apprentices in this study were:-

(1) Motorbikes (32.5%). (2) Football (21.5%). (3) Cars (20%).
(4) Music/discos (15.5%). (5) Women (12%). (6) Drinking (8.5%).

The only area of common ground between the 15 year olds and the under 18's was probably football assuming that football was one of the outdoor games played by the 15 year olds. The pastime of watching television was listed by 50% of the Enquiry 1 students whereas only 1.86% of all apprentices said that this was one of their hobbies/ pastimes.

It is quite clear that a considerable change can come about in a student once he has left Secondary School and obtained a job, his pastimes transferring from "boyish" things to "manly" things. This point is highlighted by the fact that the apprentices over 18 years of age, although not changing the top six pastimes, list them in a different order. The pastimes of going out with girlfriends and drinking have a greater priority, the order now being (1) Cars (31.5%). (2) Drinking (23.5%). (3) Motorcycles (21.5%). (4) Women (16.5%). (5) Music/ Discos (16.5%). (6) Football (13.5%).

BOOKS READ BY APPRENTICES

It is apparent from the results reported in CHAPTER 8 that apprentices in the main do not read books either for pleasure or in connection with their college studies.

This is a real and often neglected problem for unless a student is able to use books, particularly in connection with his course, the question arises of how this will affect his course work and ultimately his end of session examinations.

From interviews carried out with a number of students the writer is quite convinced that students have not been encouraged to use library facilities either at their comprehensive school or at the technical college and certainly not at home. This problem of an apparent dislike of reading books was also one of the findings of Enquiry I (1968). This enquiry discovered that early school leavers generally liked reading less than any other pastime activity. This is not really surprising since it was also reported in Enquiry I that just over one third of the parents of the 15 year old school leavers owned less than six books and a similar proportion disliked reading or said they had no time for it.

The problem then of this complacency concerning reading books and educating these youngsters to get into the reading habit is not going to be an easy one. Nevertheless time and effort on the part of educators must be devoted to this obvious problem.

SCHOOL SUBJECTS MOST ENJOYED

The subjects listed by all craft students as being the most enjoyed at school were:- (1) Metalwork (30%) (2) English (20%) (3) Woodwork (18%) (4) Physical Education (17.5%) (5) the subjects of Geography and Technical Drawing came joint fifth with 9% of students saying they enjoyed these subjects.

As had already been indicated, the main differences between craft students and technician students is the technician students' ability in mathematics. Not only did technician students have a greater ability at mathematics but they also enjoyed this subject, as can be seen from the top five listed subjects produced by technicians:-

(1) Metalwork(30%) (2) Woodwork (19%) (3) Technical Drawing (19%)
(4) Mathematics (16.5%) (5) Physical Education 14%)

It can also be seen that a greater emphasis has been given to the subject of technical drawing, a mathematically orientated subject, by the technicians.

In a study carried out by Lipshitz (1972) involving 35 motor vehicle craft students from a West London college it was found that the most enjoyed subjects at school were (1) Subjects relevant to engineering - technical (57%) (2) Sport - Sports P.E. Games, Gardening, Duke of Endinburgh Award Scheme (28.5%) (3) General Arts - Geography, History Economics (28.5%) (4) Languages - Latin, French, English (25.7%) (5) Theoretical science - Science and Mathematics (25.7%).

Of the 35 students in this study, 17 were classified as 'stayers' and 18 as 'drop-outs' and it is interesting to note that the drop-outs i.e. those who did not complete the course successfully, listed the subject of general arts as their first choice of subject most liked at school, showing 50%. The subjects related to engineering came out as second choice with a score of 33.3%.

Studying these figures it seems that, in many instances, craft students placed on motor vehicle courses had a definite leaning in their subject interests towards the languages and the arts, this tendency being the opposite in the case of technician students. Leanings of these students are more inclined to be practical and mathematical subjects, indeed this tendency was also indicated by the craft student 'stayers' in the Lipshitz study. The inference here is that those students who enjoy and are probably quite satisfactory in practical/mathematical subjects are more likely to start a course at technical college and stay on it. In an effort to give credence to this point, the writer made some comparisons of technician student enrolments with craft student enrolments at one North Eastern College. Out of a total of 93 first and second year motor vehicle craft students who enrolled in September 1980, 11 had left the course during the first six months. This compared with one out of a total of 43 first and second year technician students who left the course during the same period.

It was also found, in a study made by Morgan and Hale (1977) that those motor mechanics who had unfavourable comments to make about their apprenticeship complained either of too much mathematics or insufficient practical work.

ENJOYMENT OF SCHOOL

Student groups did not differ greatly in the numbers who said they enjoyed Secondary School, there being an average of 70,5% of all students saying they did enjoy Secondary School. The students were given complete freedom in saying why they enjoyed school and from their reasons the top three were extracted for each group and when grouped together produced the following:- (the reasons for liking school are followed by the percentage of all students who gave that particular reason).

(1) Had good friends (27.5%) (2) Had a good time (22%)

(3) Enjoyed the sport(12.5%) (4) Enjoyed lessons (9.5%)

(5) Good teachers(4.5%)

Appearing in the craft students' responses but not in the technicians' was 'the enjoyment of lessons' but the technicians were the only group to mention 'the enjoyment of sport' and 'good teachers'.

Of those students who said they disliked Secondary School, there was unanimity in their three main reasons for this attitude. These were (1) Didn't like teachers (74.5%) (2) Didn't like lessons (32.25%), (3) Didn't like discipline (31.5%).

By far the most significant reason for disliking Secondary School was the students' dislike of the teachers, this result differing considerably from Enquiry I findings, the students in this study putting emphasis on discipline and the lack of interest in lesson subject matter as their main reasons for a negative or unfavourable attitude to school.

PROGRESS FROM SCHOOL TO EMPLOYMENT

With an average of over 70% of students saying they enjoyed their years in Secondary School, why then did those students who had the opportunity of staying on at school leave at the minimum leaving age? From the students responses on this matter the most common reason for leaving was one of independence. Students wanted a job in order to earn money. They felt that they had reached an age where money was becoming extremely important to them in that they were developing interests which were generally costly to pursue, and the kind of money they needed to take out girl friends and go to discos and perhaps buy a motorcycle was not in general forthcoming from parents. It is perhaps not surprising that parents faced with financial pressures of this kind did not in general advise their sons to stay on at school, there being only an average of 4.5% of craft students parents giving such advice. Even the parents of the more academically qualified technician students did not give positive advice to their sons to stay on at school, there being an average of only 9% of technicians' parents having given this advice. Garland (1969) found that 27% of all first year students attending Durham Technical College during the session 1968-69 left school early on the advice of parents, intimating that the tradition of leaving school and starting work as soon as possible is very strong in the North East. In this study an average of 30% of craft student parents advised their sons to leave school and get a job as opposed to 25% of technician student parents who gave this advice. The most outstanding feature of advice, or to be more accurate, lack of advice given by parents to their sons regarding staying on or leaving school was that an average of 67.75% of all parents left this major decision to the students themselves. This, coupled with the apparent lack of positive advice given by their schools and the general feeling of some students that they disliked school and thought they were wasting their time, means that it was almost inevitable that these students would leave school. Dean (1977) discussed these very points with a group of students at a college of further education and he quotes them as saying that after 'O' levels it is time to change and be treated as an adult and that at college they find the life very different from that of school. These comments tie up considerably with comments made by apprentices in this study who also lay great store by independence and dislike of the discipline at school, many thinking that they were treated like babies by some of the teachers.

HELP RECEIVED FROM TEACHERS/SCHOOLS IN FINDING SUITABLE EMPLOYMENT

Just over half of the apprentices taking part in this work expressed a satisfaction with their Secondary School teachers. This figure relates to an average of 53% of apprentices who said that no one at Secondary School stood out as being particularly helpful to them in any way. For those students who received help, the help indicated was (1) Help with lessons (average percentage of all groups saying this) (21.75%). (2) Help generally (8.5%) (3) Help with personal problems (7.25%). (4) Help in getting a job (5.5%).

It is interesting to note that over three times as many technician students said they received help with personal problems from teachers than did craft students. Apart from the specific area of personal problems no clear pattern emerged from the findings regarding other kinds of advice.

Looking at the figure of 5.5% of all students who said they received help in getting a job from teachers at school, it must be remembered that this was in reply to an open ended question where the student was asked to list any ways in which he had received help from teachers at school. In a later question students were asked directly exactly what help they had received from their school in the task of obtaining a suitable job. In this way students' replies would tend to be specific, for instance those students who said they had received general help from the teaching staff may very well have received help in obtaining a job. Twenty per cent of all craft students said they received help in obtaining a job compared with 26.5% of technician students who said they received help in this way. This left an average of 76.5% of all students who indicated that they received no help at all from the school in gaining employment. Thomas (1974) in the report 'Looking forward to Work' observed that 79% of boys at Comprehensive schools taking part in that work said they had not even talked to a careers teacher.

Advice on careers and information on associated matters given by schools and as reported in Enquiry I (1968) paints a much rosier picture than that suggested by the finding on apprentices in this study. For example, in Enquiry I the percentage of school heads who said that advice on the various aspects of career work was already being given in their schools was as follows:-

(1) information on careers(95%) (2) advice on careers (96%) (3) placements (54%) (4) preparation for work (87%) (5) follow-up (31%)

But, as also reported in Enquiry I, careers work being carried out in the schools in that survey was predominantly handled by people who had had little or no specific training for it. As reported by the Organisation for Economic Co-operation and Development (1977) teachers are not sufficiently aware of the problems of industry and commerce. It is also logical to assume that only a small number of school teachers are able to give specific advice on technical college courses for, as stated in 15-18 (1959), there are very few teachers in schools who are themselves the products of technical colleges and, although a large number teach in evening institutes and some in technical colleges, it is unlikely that many of them have an adequate knowledge of further education courses as a whole. The Haslegrave Report (1969) stressed the point when it said that it was of critical importance that pupils should be well-informed about the wide range of job opportunities open to them when they leave school. This means, of course that if the people who guide them are to do their job effectively, they must have a knowledge of the general range of occupations available in industry and business and the educational standard required for entry to these occupations at the various levels. A most essential part of this knowledge, it is claimed, must be familiarity with the relevant part of the further education system. Haslegrave was predominantly concerned with technician education, but it would seem appropriate that his advice would also be beneficial to all those concerned with responsibility for careers work at all levels.

JOBS AND EMPLOYMENT

Overall, considering the students' responses to his work and place of employment and life at college, the general picture is, subject to a few exceptions, one of comparative satisfaction. Students appear to receive considerable encouragement from employers to do well on their college courses. A total of 18.6% of all the students taking part in this study had at least one previous job so; in many cases the students were able to make direct comparisons with other areas of employment when judging the merits of their present jobs.

It is also interesting to note from students' responses that they considered their jobs to be secure at the time of filling in the survey. One wonders what their responses would be today in the light of the developing recession over the past few months. The writer, having made preliminary pilot interviews with a random selection of students, is of the opinion that this is one area of the study in which students might have answered differently at this present time.

HOW JOBS WERE FOUND

An amazing fact emerging from this work is that the majority of apprentices taking part had actually found their jobs by what could be called a 'chance' factor in that 43% found their jobs through a relative, friend or acquaintance at the firm in question and a further 31% found their job by calling or ringing unannounced at the firm in question. Only 17% of these apprentices found their jobs through the more formal method following an interview with a careers officer even though 90% of all students received an interview in this way. It follows from this that in many cases apprentices were taken on at their firms simply because they 'knew someone' and not necessarily because their ability in the right areas of work justified them being offered the job. These figures of informal ways in which apprentices found their jobs are, it must be agreed, a poor reflection of the job selection system but, as bad as they appear, they are not quite as bad as figures reported in the Schools Council Enquiry I (1968) which showed that a total of 63% of the boys who were leaving school at 15 and had jobs secured, found these jobs through personal contacts such as parents, other relatives or friends working in a firm or having contacts there. Only 12% of these boys mentioned the Youth Employment Officer as the source of their employment. It seems to follow from this, that if firms made better selections of their apprentices then they would get young men who are genuinely interested in the type of work offered. It also follows that the persons selected for apprenticeships could have better relevant qualifications which can eventually lead to an overall raising of the service and repair standards within the motor industry, improved results from technical college examinations and less wastage amongst motor vehicle apprentices. The problem of correct selection was highlighted in the Pilkington Report on the Wastage of Students from part-time Technical and Commercial Courses (1959) when it was stated 'Perhaps enough thought is not yet given in the selection of recruits for industry, to the question of the ability of the recruit to profit from the course of instruction which he will be required to undertake. In some industries, of course, apprentices or other recruits are accepted only if they have specific educational qualifications and if the right standard is used, the rate of wastage in such cases should be much reduced. Faulty selection by industry not only involves industry in increased costs but will also involve a waste of educational effort and money!

TEACHING METHODS

Skinner (1972) wrote 'there is little doubt that education is in trouble. It faces many different kinds of problems, for which many different kinds of solutions will have to be found.' Skinner suggests that one of these problems is economics and that one solution to the economic problem is simply to make instruction more efficient. Frankland (1969) also considered the efficiency of instruction to be of paramount importance when he expressed the view that there can be little doubt that the pace of educational developments will necessitate a continuous pattern of experiment and re-appraisal. A system of technical education must react sharply to the new materials, techniques, processes and standards in developing and modern industries by re-drafting its organisation, content and teaching methods at frequent intervals. On the one hand, planners and administrators must assess what changes are necessary and, in consultation with teachers, decide on the most effective means of implementation. On the other hand, technical teachers must accept that they are part of a dynamic system, and be prepared to adopt new curricula and teaching methods, keep in close contact with their local industries and be willing to undertake courses of professional re-training. Although many people may be actively involved in the process of curriculum development, from man-power planner, job analysts and technical experts to examination specialists, the role of the technical teachers, who are in close contact with students, is of absolutely critical importance to the success of any schemes for improvement. Bloom (1971) is also in tune with these views when he talked of the use of alternative methods of instruction and instructional material and that the essential point to be borne in mind is that these alternative methods are an attempt to improve the quality of instruction in relation to the ability of each student to understand the instruction.

In tune with the writer's experiments concerning teaching with the aid ofinstructional objectives was an experiment carried out at Stanford University and described by Mager(1969). In this experiment students were required to learn the pieces, rules, and strategies of a new game. One group learned from a linear programme while each member of another group was provided with objectives. The members of the group which had control of the curriculum performed almost as well as those learning from the linear programme, but they required only half the instructional time.

In this particular piece of work, in all cases where comparisons were made between students being taught by traditional methods and those taught by objectives, students achieved significantly higher scores in criterion referenced evaluation tests when taught with the aid of objectives. It was also apparent from the results obtained from the students opinion rating that a syllabus topic written objectively is much clearer to them than one written subjectively. Nevertheless when the lecturers were given a list of objectives and asked to place each objective within one of four intellectual levels and even when these intellectual levels were explained in detail and given to the lecturer, it was found that a considerable amount of difficulty was encountered. Lecturers found it difficult to classify the intellectual level of a given objective, the indication being that more information is needed than simply a straight forward statement of the instructional objective.

HOEMWORK ACTIVITIES

In this present survey, lecturers listed the following methods as being, in their opinion, the three most suitable and effective ways in which students should carry out homework activities for given subjects:-

(The percentage frequency of this choice is shown in brackets).

(1) TECHNOLOGY
(a) Collecting information from work (57%)
(b) Reading text books (45%)
(c) Working through self study packages (28%)

(2) SCIENCE
(a) Reading text books (45%)
(b) Tackling new problems (34%)
(c) Working through self study packages (31%)

(3) MATHEMATICS
(a) Tackling new problems (45%)
(b) Working through self study packages (31%)
(c) Reading text books (28%)

(4) WORKSHOP PRACTICE
(a) Collecting information from work (46%)
(b) Practising of routine skills/procedures (42%)
(c) Homework not needed (34%)

(5) INDUSTRIAL STUDIES
(a) Homework not needed (39%)
(b) Reading text books (32%)
(c) Working through self study packages (24%)

COMPARISON OF OPINIONS

There was considerable agreement between lecturers and students on the most effective homework activities for the given subjects, there being an overall 58% agreement in the top three choices. The main difference was that students were frequently of the opinion, in their top three choices, that homework was not needed.

STUDENTS' RECORD OF INFORMATION

Lecturers were of the opinion that the most suitable and efficient ways in which students should make a record of information for given subjects, were as follows:- (Percentage frequency in brackets)

(1) TECHNOLOGY
(a) Notes from the blackboard (72%)
(b) Class handouts (68%)
(c) Dictation from teacher (50%)

(2) SCIENCE (a) Notes from blackboard (81%)

(b) Class handouts (53%)

(c) Use of text books (50%)

(3) MATHEMATICS (a) Notes from blackboard (78%)

(b) Use of text books (57%)

(c) Class handouts (41%)

(4) WORKSHOP PRACTICE (a) Own made notes (54%)

(b) Class handouts (46%)

(c) Use of text books (24%)

(5) INDUSTRIAL STUDIES (a) Class handouts (45%)

(b) Own made notes (45%)

(c) Use of text books (38%)

COMPARISON OF OPINIONS

The average overall percentage agreement between lecturers and students on the three most effective ways of recording information for given subjects was 53.4%. The results showed that in the case of craft students over 18 and technician students under 18, out of a possible 15 choices of recording information, there was agreement on 12. The craft under 18 had agreement on 13 and the technician students over 18 had agreement on 14.

TEACHING METHODS/LEARNING ACTIVITY

The three most effective teaching/learning activities which, in the opinion of lecturers, would be most effective for each of the five subjects listed are:- (Percentage frequency in brackets)

(1) TECHNOLOGY (a) Exposition (92%)

(b) Question and answers (77%)

(c) Practice
Lab. and W/S Activities } (28%)

(2)	SCIENCE	(a)	Exposition (80%)
		(b)	Question and answers (55%)
		(c)	Lab. and W/S Activities (55%)
(3)	MATHEMATICS	(a)	Exposition (76%)
		(b)	Question and Answers (58%)
		(c)	Practice (49%)
(4)	WORKSHOP PRACTICE	(a)	Lab. and W/S Activities (70%)
		(b)	Practice (66%)
		(c)	Exposition (53%)
(5)	INDUSTRIAL STUDIES	(a)	Group discussions and assignments (57%)
		(b)	Exposition
		(c)	Question and answers (32%)

COMPARISON OF OPINIONS

Again a considerable amount of agreement was achieved between lecturers and students on the question of the most effective teaching/ learning activities for given subjects. The craft students under 18 and technician students over 18 agreed on 13 out of a possible 15 activities, technician students under 18 agreed with lecturers on 14 and the craft students over 18 agreed on all 15 teaching/learning activities.

The results obtained from lecturers and students based on their three highest choices for the most suitable and effective ways to carry out homework activities, the recording of information and teaching/learning activities to be adopted for the five subject areas given are depicted in charts 10.7 to 10.36. It can be seen that a considerable amount of agreement exists between lecturers and students on the most effective methods. For these activities, the main differences are that the lecturers, as one would expect, are more positive in their choices. It is also apparent that lecturers tend to be quite traditional in their teaching approach, preference being shown for the teaching/learning activities of exposition and question and answers, followed by laboratory and workshop activities and practice. Newsom (1963) also agreed that practical work was an efficient method of teaching, especially with less able students. Lecturers think that the most efficient and effective homework activities are those of reading text books and working through self study packages. The students agreed that reading text books is an effective method of homework activity, but also considered that copying up notes and tackling new problems is also quite effective. The most efficient method of recording information as agreed by both lecturers and students was by the use of notes from the blackboard and class handouts.

ATTITUDES AND OPINIONS

Laycock (1972) expressed the opinion that there are very few objects in an individual's environment towards which he does not have some feelings, positive or negative, favourable or unfavourable. These feelings range from very mild responses which would barely affect the person in question, to strong emotional reactions which exert a marked directive effect upon the person and his behaviour and that a consideration of attitudes becomes necessary in the study of the teacher - learning situation. It was with these points in mind that a number of opinion scaled questions were given to the students in this study, the same questions being given to lecturers who were asked to anticipate the students' responses. By doing this, it was thought that lecturers' expectations of students would be highlighted. When responses to these questions were studied it was found that students' attitudes and opinions with regard to course content, the way in which courses are presented to them, the teaching staff with whom they have contact and their employment and environment in which they work and live were in the main quite favourable. And, contrary to lecturers' expectations, students had in many cases quite definite opinions on these matters.

For the sake of comparison, the following significant points listed, relating to the opinions of students as given on their five point scale, have been divided into two areas. Area 'a' is concerned with those opinions given by students which were anticipated by lecturers and area 'b' is concerned with those opinions expressed by students contrary to lecturers' expectations.

SIGNIFICANT POINTS RELATING TO THE OPINIONS OF STUDENTS ON THE FIVE POINT SCALES

(a) STRONG OPINIONS GIVEN BY STUDENTS THAT WERE ANTICIPATED BY LECTURERS

1. Students who attend part-time day release courses tend to feel that they miss out on college activities.
2. Lecturers in technical colleges need to have good academic qualifications.
3. Lecturers in technical colleges need to be good practically in order to teach technical subjects effectively.
4. All lecturers in technical colleges should be trained to teach.
5. Generally speaking it is felt that there is a friendly atmosphere existing between lecturers and students at technical college.
6. Students think that the opinions given by lecturers at technical college concerning course matters are generally good ones.
7. Students generally feel that enthusiastic college lecturers make them feel enthusiastic.
8. Students agreed that the principal aim of college lecturers is to bring about improved standards of skill in their performance.
9. Students, when at college, think that they should be encouraged

to speak out in class if they do not understand something said by the lecturer.

10. Students think that practical demonstrations by the lecturer are essential when teaching motor vehicle subjects.

11. Students feel that it is important that the lecturer teaches the related topics of the syllabus in a clear and natural order.

12. Students feel that it is important that they know the previous year's examination results of the course they are attending.

13. In the main, students think that revision given at the end of each term would be effective.

14. Students think that revision at the end of the course would be effective.

15. Student think that an objectively written syllabus is very clear to them.

16. Technology as a subject is considered interesting by students.

17. Workshop practice as a subject is considered to be very interesting by students.

18. Students thought that the subject of technology is important to them in their job.

19. Students think that the subject of workshop practice is important to them in their job.

20. Passing their examinations is important to motor vehicle apprentices.

21. It is important to students that they pass their college examinations because it gives them personal satisfaction.

22. It is important to students that they pass their examinations because it will give them better career prospects.

23. It is important to students that they pass their college examinations because it will please their parents.

24. It is important to students that they pass their college examinations because it will please their employers.

25. Technician students look forward to the day when they will be in a position of responsibility at the firm where they work.

(b) <u>SIGNIFICANT POINTS EMERGING IN WHICH THERE WAS DISAGREEMENT BETWEEN STUDENTS' AND LECTURERS' OPINIONS</u>

1. Lecturers thought that craft students would disagree with the statement 'that in order to succeed at technical college they must read text books'.

2. Students on average thought they should be given the opportunity of participating in administrating student facilities.

3. Lecturers thought that students would react more positively than they actually did to the statement 'the college sometimes interferes with my personal life'.

4. Students think that the library facilities at their colleges are perfectly adequate.

5. Students generally feel that they are treated with respect by college lecturers.

6. In the main, students think that college lecturers are enthusiastic and seem to enjoy their work.

7. Students generally agree that the course they are attending is effectively organised.

8. Lecturers think that technician students would, at the end of their day at college, go away feeling as though they had learnt more than the technicians actually thought they had themselves.

9. In the main, students think that the advantages of being successful on their course at college has been adequately explained to them.

10. Students think it important that they should be given a statement at the beginning of a teaching programme indicating the topics that they are to be taught and the reasons why they are being taught them.

11. Students feel that it is important to be given 'progress bulletins' on their performance as students.

12. Students think that it is important that they know the teaching methods to be adopted for each topic on the syllabus.

13. Students think it important, when starting a new topic, to know how much time is available to complete it.

14. Students think it important to be given a detailed syllabus so that they can check their progress in topics completed.

15. Students when asked if they think it important that they be consulted on the teaching order of course topics, answered more positively than lecturers anticipated they would.

16. In general students think that a traditional syllabus statement is clear.

17. Lectuers thought that students would say they find the subject of science uninteresting. This opinion proved to be incorrect.

18. Lecturers thought that craft students would say that they found the subject of mathematics uninteresting, whereas students themselves were equally divided in their opinions between finding the subject interesting or uninteresting.

19. Lecturers thought that students would say that the subject of industrial/general studies is uninteresting. Again this opinion proved incorrect.

20. Lecturers thought that craft students particularly would find the subject of science unimportant to them and their jobs. This proved incorrect.

21. Lecturers think that students find the subject of mathematics far more unimportant to them in their jobs than they actually do.

22. Lecturers think that students find the subject of industrial studies more unimportant to them in their jobs than they actually do.

23. It is important to students that they pass their college examinations because the thought of failure frightens/concerns them.

24. In the main students disagree that their jobs are unpleasant.

25. Lecturers thought that students would disagree with the statement 'students enjoy doing their jobs as much as they enjoy their leisure time'.

26. Students consider their work to be interesting.

27. Students are satisfied with their jobs.

28. On average students disagree with the statement that they consider their jobs to be boring.

29. Students are of the opinion that they enjoy their jobs more than the average worker.

30. Students think that their work gives them real enjoyment.

31. Students, if given the choice of either staying at home or going to work, in the main prefer to go to work.

32. Concerning the statement that the most important thing about a job is to get well paid for it, students answered far less positively than expected by the lecturers.

33. Students like their day at work to be very busy.

34. To the question of whether students think they are sometimes used as a source of cheap labour at work, lecturers thought students would answer far more positively than they did.

35. Students generally feel enthusiastic about their jobs.

36. Students when they chose to work at their firm did not consider money to be the main consideration.

37. Students feel that their jobs are secure and there is little chance of redundancy.

38. Students are less likely to be looking for a complete change of employment away from the motor/transport trade than lecturers thought.

CHAPTER 14

SUMMARY OF PRINCIPAL CONCLUSIONS AND RECOMMENDATIONS

ADVICE GIVEN TO STUDENTS PRIOR TO EMPLOYMENT

It was evident that many of the students who found their way into the motor industry as apprentices had not been given either correct or sufficient careers advice from parents, schools or career agencies.

Teachers responsible for careers advice in schools should, on the evidence of this work, be allowed more time to carry out this important aspect of their responsibilities. According to students, there is little advice of a constructive nature forthcoming from their school. For the reasons discussed, it would therefore be beneficial for all teachers who hold career advice responsibilities to undergo specific training courses, preferably industry and technical college based, whereby they can obtain the knowledge required to be able to converse with confidence with their pupils on the merits of various employment areas and the ideal qualifications needed for those areas. They would also be able to advise a student, after careful study of his 'profile', as to the most suitable area of employment for him. Students would also benefit from visits to industry and the technical college to see for themselves where their ambitions may take them. There is, at the present time, little co-operation and co-ordination between the efforts of schools, parents, careers services and the technical college on careers advice.

SELECTION FOR EMPLOYMENT

It was evident that many students taking part in this research found their way into their apprenticeship by what can only be called a 'chance factor', there being very little evidence to suggest that a recognised consistent means of selection takes place for the entry of new apprentices into the motor industry. It appears that what could only be considered as haphazard means of engagement takes place for the average apprentice who would be released from his employment for one day per week to attend technical college.

These lax recruitment arrangements in the motor industry undoubtedly contribute to apprentice and student wastage. It would therefore be prudent and advisable for those responsible for staff recruitment within the garages to pay greater attention to this important matter. Greater emphasis should be placed on liaison with the schools and career services in the early stages of recruitment and, in the final stages, help could be sought from specialists from the local technical college. This procedure of selection is of paramount importance, particularly to the smaller firms which constitute a considerable proportion of the motor industry, and who would not normally employ anyone with specialist knowledge in this area of work.

STUDENTS WHO STAY AND WHO LEAVE

Those students with the more 'academic' background who, as well as being interested in and proficient in engineering and craft topics at school, show also that they are interested in and capable in the subject of mathematics, tend to find their way onto technician courses. The students falling within this category are considerably less likely to have had previous employment, and are also far less likely to leave their courses prematurely.

There seems to be an underlying mathematical ability needed by all motor vehicle apprentices, which often is underestimated by those responsible for recruitment. Those students seeking motor vehicle apprenticeships should be required to demonstrate their ability in this subject as one of the criteria for selection. The writer feels that this ability, coupled with a general mechanical aptitude, would help the student to a more stable and successful apprenticeship.

LIFE AT TECHNICAL COLLEGE AND PLACE OF EMPLOYMENT

It has been the writer's intention during this work to consider the needs and interests of students engaged on motor vehicle courses and correlate these needs and interests with lecturers' opinions concerning the course content and lecturering/teaching methods, as these two aspects of planning are often influenced by the way in which lecturers interpret what, in their veiw, would be students' opinions and attitudes on these matters.

In reply to questions connected with their life and work at technical college and place of employment, students were far more positive and constructive than lecturers anticipated they would be, and could generally be described as being satisfied with these aspects of their life.

GROUPING OF RESPONSES FROM STUDENTS

PARTICIPATION

Students indicated that they would like to be given the opportunity to take part in and express views on matters relating to the many aspects of college life.

LECTURERS' PROFILE

Students expect that their college lecturer should have good qualifications, be teacher trained and be good practically in order to teach technical subjects efficiently.

There was agreement among students that the principal aim of college lecturers is to bring about improved standards in them and this they attempt to do with enthusiasm and with a general feeling of friendly respect to students. Students also feel that the opinions of lecturers concerning course matters are generally good ones and that the advantages of being successful on their course at college has been adequately explained to them.

PLACE OF EMPLOYMENT

Students' jobs gave them a feeling of real enjoyment and they indicated that they found their employment pleasant, interesting and satisfying and, in consequence, were not looking for a change of employment away from the motor/transport industry. Students also voiced the opinion that, when they started work with their firm, money was not the main consideration.

EXAMINATION SUCCESS (* - correspond to lecturers opinions)

Passing college examinations is important to students because:-

(a) the thought of failure frightens/concerns them,

*(b) it will give them personal satisfaction,

*(c) it will give them better career prospects,

*(d) it will please their parents,

*(e) it will please their employers.

COURSE DESIGN AND DEVELOPMENT (* - correspond to lecturers opinions)

In certain areas of this work there is evidence of lecturers having pre-conceived ideas of a negative nature concerning the attitudes and opinions of students. Nevertheless a considerable amount of agreement did occur on course matters and by correlating all results from both lecturers and students indicants emerge as to what should or should not be included in course design and development.

1. Students think it important that they be given a detailed syllabus.

*2. Students think it important that they be given a detailed syllabus in a clear and natural order.

3. Students think they should be consulted on the order of topic presentation.

4. Students would like to know the 'time available' to complete new topics.

5. It is important to students to be given a statement at the beginning of a teaching programme indicating the topics they are to be taught and the reasons why they are being taught.

6. Students think it important that they know what teaching/lecturing methods are to be adopted for each topic on the syllabus.

*7. It is important to students that they know the previous year's examination results of the course they are attending.

*8. Students think that an objectively written section of the syllabus is clearer than when presented traditionally.

9. Students feel that it is important to be given 'progress bulletins' on their performance as students.

*10. Students think that practical demonstrations by the lecturer are essential when teaching motor vehicle subjects.

*11. Students think that revision given at the end of each term and at the end of the course would be effective.

*12. Technology as a subject is considered interesting by students.

13. Science as a subject is considered by students to be 'more interesting' than expected.

14. Mathematics as a subject is considered by students to be more interesting that expected.

*15. Workshop practice as a subject is considered very interesting by students.

16. Industrial studies as a subject proved to be 'more interesting' to students than expected.

*17. Students think that the subject of technology is important to them in their job.

18. Students think that the subject of science is more important to them in their job than expected.

19. Students think that the subject of mathematics is more important to them in their job than expected.

*20. Students think that the subject of workshop practice is important to them in their job.

21. Students think the subject of industrial studies more important to them in their jobs than expected.

HOMEWORK ACTIVITIES

The most effective homework activities (if homework is to be given) agreed by both lecturers and students are:

1.	TECHNOLOGY:	Reading text books and collecting information from work.
2.	SCIENCE:	Reading text books and tacklingnew problems.
3.	MATHEMATICS:	Tackling new problems.
4.	WORKSHOP PRACTICE:	Practising of routine skills and collecting information from work.
5.	INDUSTRIAL STUDIES:	Reading text books.

NOTE: The first choice in the case of industrial studies for both lecturers and students is 'homework not needed'.

The main areas of disagreement between lecturers and students on the most effective homework activities are:-

(a) lecturers think that the activity of copying up notes an ineffective homework activity and students do not.

(b) contrary to lecturers' opinions, students think that the activity of working through self study packages is ineffective.

STUDENTS' RECORD OF INFORMATION

In the view of both lecturers and students the most effective ways of students recording information for given subjects are:-

1.	TECHNOLOGY:	Notes from blackboard and class handouts
2.	SCIENCE:	Notes from blackboard and class handouts
3.	MATHEMATICS:	Notes from blackboard and use of text books
4.	WORKSHOP PRACTICE:	Own made notes and class handouts
5.	INDUSTRIAL STUDIES:	Class handouts and own made notes.

In all cases, the first and second choice of method of recording information was the same for both lecturers and students except for the subject of industrial studies where the lecturers place in joint first the methods of class handouts and own made notes. The students consider that the most efficient methods of recording information are class handouts and dictation from the teacher.

TEACHING METHODS AND LEARNING ACTIVITIES

The most efficient teaching methods/learning activities for specified subjects as agreed by both lecturers and students are:-

1.	TECHNOLOGY:	Exposition and question and answers
2.	SCIENCE:	Exposition and question and answers
3.	MATHEMATICS:	Exposition and question and answers
4.	WORKSHOP PRACTICE:	Laboratory and workshop activities and practice
5.	INDUSTRIAL STUDIES:	Group discussions and assignments and exposition.

Lecturers and students do not consider the teaching methods of individual tutorials and self study packages as being effective in the teaching situation.

CLASSIFICATION OF INTELLECTUAL LEVELS

The results obtained from this section of the lecturers' questionnaire highlighted the ambiguities that exist in the way objectives are interpreted. The lecturer, even when given clear definitions of the various intellectual levels found it difficult to agree on a particular level for each objective. The classification of intellectual levels of objectives where agreement did occur tended to be at the lower levels. The conclusions drawn from these results are that objectives need to be classified when written and explained with more precision by the writer than has been the practice in the past.

STUDENT EVALUATION TESTS

Even with a certain amount of misinterpretation of intellectual levels of objectives, the results obtained from the evaluation tests were encouraging. The indicants are that objectives, when used for lesson presentation and/or for revision purposes, enabled the students to score significantly higher than those students who had been taught and had revised in the traditional way.

THE FUTURE

The problems encountered by educationalists to ensure that students who start a course of study successfully complete it are obviously great and complex in nature. Nevertheless it is hoped that this work has gone some way towards clarifying problem areas which are prevalent at the present time and that the evidence presented will be of value to those responsible for course planning in the years ahead.

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