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THE DEVELOPMENT AND EVALUATION OF DISTANCE LEARNING
MATERIALS FOR ADMINISTRATIVE PERSONNEL
IN A MULTI-NATIONAL COMPANY

LINDSEY GILROY

Thesis submitted for the degree of Doctor of Philosophy

THE UNIVERSITY OF ASTON IN BIRMINGHAM

May 1989

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SUMMARY

There has been substantial research into the role of distance learning in education. Despite the rise in the popularity and practice of this form of learning in business, there has not been a parallel increase in the amount of research carried out in this field. An extensive investigation was conducted into the entire distance learning system of a multi-national company with particular emphasis on the design, implementation and evaluation of the materials. In addition, the performance and attitudes of trainees were examined.

The results of a comparative study indicated that trainees using distance learning had significantly higher test scores than trainees using conventional face-to-face training. The influence of the previous distance learning experience, educational background and selected study environment of trainees was investigated. Trainees with previous experience of distance learning were more likely to complete the course and with significantly higher test scores than trainees with no previous experience. The more advanced the educational background of trainees, the greater the likelihood of their completing the course, although there was no significant difference in the test scores achieved. Trainees preferred to use the materials at home and those opting to study in this environment scored significantly higher than those studying in the office, the study room at work or in a combination of environments. The influence of learning styles (Kolb, 1976) was tested. The results indicated that the convergers had the greatest completion rates and scored significantly higher than trainees with the assimilator, accommodator and diverger learning styles.

The attitudes of the trainees, supervisors and trainers were examined using questionnaire, interview and discussion techniques. The findings highlighted the potential problems of lack of awareness and low motivation which could prove to be major obstacles to the success of distance learning in business.

DISTANCE LEARNING : LEARNING STYLES : TRAINING

DEDICATION

To Carl for his love and support

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I.I INTRODUCTION

The CBI (Confederation of British Industry)/Open University Joint Conference (1986) highlighted the growing interest and investment in distance learning as a solution to the kinds of training problems currently experienced by many businesses. Despite the rise in the popularity and practice of distance learning, there has not been a parallel increase in the amount of research into this field.

Admittedly, there has been substantial research into distance learning in the educational setting (see, for example, work by the Open University (OU) and the National Extension College (NEC)) but no comprehensive investigation has been conducted into the role of distance learning in the business environment. It is important that research in this area be conducted not only from the point of view of business but more importantly from that of the trainees who are subjected to the current training trends sometimes with, but usually without, due regard for their expectations and learning characteristics. Distance learning is a training method which takes into account the learners' needs from the design stage throughout its implementation to the completion of the course.

Clearly, there is a demand for research into the role of distance learning in business. This thesis answers this demand in providing a comprehensive study of the entire distance learning system in a multi-national company whilst concentrating on the design, implementation and evaluation of the distance learning materials. In addition, this thesis investigates the influence of learning styles on the performance of trainees using distance learning materials in terms of test scores and attitude; previous research into the role of

learning styles in education is applied to distance learning in business. The hypothesis that particular learning styles are more compatible with this specific instructional technique is tested. The role of motivation is examined; the hypothesis that trainees with higher levels of motivation have a greater likelihood of completing distance learning courses, and with better performance scores, is investigated. The influence of previous distance learning experience on the motivation, completion rates and performance scores of trainees is examined.

Another factor cited in the literature to have a positive influence on completion rates and performance is the educational background of the trainees; trainees with a higher level of education are reported to have a greater probability of completing distance learning courses than those with lower educational backgrounds.

The influence of the environment in which distance learning materials are studied on the performance and attitude of trainees was investigated in order to establish whether a particular environment should be recommended for trainees using this form of learning. Finally, the performance of the trainees using distance learning is compared to that of trainees using conventional training methods involving classroom-based, face-to-face instruction.

1.2 A DEFINITION

One feature of distance education often expressed in the literature is the need for greater analysis (Bååth,1978). This embraces the absence of a recognized theoretical framework comprising "the macrofactors" (Moore,1973), involving "defining the field and discriminating between components of this field" (p.661). Recently,

attempts have been made to clarify the ambiguity and confusion surrounding the literature on distance education. Various definitions of the term 'distance education' have been proposed, the most widely accepted being that of Holmberg(1977);

"The term 'distance education' covers the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises, but which nevertheless benefit from the planning, guidance and tuition of a tutorial organisation" (p.9).

Moore(1977) goes further in considering not only the spatial but also the temporal separation of the teaching and learning behaviour. He classifies learning programmes by the variable of distance determined by the extent of the dialogue and the degree of structure; the more dialogue evident in the system, the greater is the structure and by consequence, the less is the distance. He describes distance study as 'telemathic teaching':

"...those teaching methods in which because of the physical separation of learners and teachers, the interactive, as well as the preactive phase of teaching, is conducted through print, mechanical or electronic devices" (p.15).

During the 'preactive phase', the teacher selects objectives and subsequently plans the course and the instructional techniques. During the 'interactive phase', the teacher is traditionally face-to-face with the learners providing them with verbal stimulation, explanations, questions and guidance (Jackson,1971).

As a result of the spatial and temporal separation of the teaching and learner behaviour, a form of non-contiguous communication is necessary. Consequently, Peters(1973) regards distance education as

"a form of indirect instruction" (p.104), employing technical media such as printed materials, radio, television and computers.

It is the nature of the mediating, learning material which distinguishes the different kinds of distance education from each other. The material contributes to the two-way communication which must occur in order for distance learning to be successful; two-way communication features predominately in definitions of distance education. Indeed, Holmberg(1986) argues that it is the main characteristic; he regards non-contiguous communication as a combination of one-way traffic by means of print, broadcast and recorded presentations through self-contained courses and two-way traffic between the learners and the tutorial organisation. The two-way communication takes the form of writing, telephone conversation and "usually only secondary and as a supplement"(p.2) face-to-face meetings.

The "conservation" is, therefore, essentially in two parts: first, in the form of internal conversation which takes place both within the learner (Lewis,1975) and as a consequence of the relationship created by the informal style of presentation of the course materials; and second, in the form of organised interaction with the tutorial organisations.

The importance of the learner being able to initiate the dialogue is stressed by Moore(1977). Flinck(1978), expanding Moore's ideas, introduces the concept of a shared teaching role and the possibility of different study situations. Peters(1973) goes beyond the scope of descriptive definition; he compares distance education with industrial procedures rationalised "by the application of the

In order, therefore, to compile a basic definition of distance education, it is essential to include certain characteristics: first, and foremost, the separation of the teacher and the learner, in space and in time; second, the resultant need for some kind of mediatory learning materials; and third, two-way conversation ensuring a link between the learning materials and effective learning behaviour, therefore achieving what in more didactic forms of instruction is the result of face-to-face interaction. The opportunity for face-to-face meetings initiated by the learners is the fourth characteristic of any comprehensive definition.

In addition, the planning and production techniques are different from other forms of instruction in so far as they are geared towards the needs of the learners rather than because of their industrial processes of production. In conclusion, it is significant that the distance learning process is commonly depicted as individual and independent in nature (see, for example, Bååth,1982; Holmberg,1986); this constitutes the fifth, and final, characteristic of distance education.

1.3 TERMINOLOGY

According to Keegan(1983) there are at least six major terms used extensively in the literature: independent study; correspondence study; home study; external studies; distance teaching; and distance education. Open learning is another common term.

Wedemeyer(1973), attributed as the proponent of the term 'independent learning' popular in the United States, stresses the acceptance by learners of "degrees of freedom and responsibility in initiating and carrying out the activities that lead to learning" (p.73).

Moore(1977) also uses this term as a means of highlighting the concepts of 'apartness' and 'autonomy'. He dwells on the choice of individuals to study where, when, at whatever pace and by whichever method they choose. The self-motivating and self-evaluating aspects of independent study are also emphasised by Alexander and Hines(1967). According to Brookfield(1983) the research and theory of Wedemeyer, Moore and Holmberg have attempted to conceptualise the relationship between distance education and independent learning.

Keegan(1983) rejects the term 'independent study' as a generic term on the basis that the relationship implied by the term is essentially different from that implied by the interactive nature of distance education. Moreover, few educational programmes exhibit such learner autonomy due to administrative, organisational and financial constraints. Consequently, although independence is sometimes an objective of 'distance education', learners are only independent of constraints when they study outside formal education and are able to dictate, for example, their own aims, learning methods, schedules and environments.

In reference to the term 'correspondence study', distance education is clearly wider in that it incorporates other media in addition to print. Indeed, the role of print-based courses is being increasingly questioned as technology takes on a greater significance in education and business. Correspondence study is, therefore, an important sub-group of distance education describing printed courses which do not necessarily encourage student contact.

'Home Study' is a term used largely in the United States in the field of further and technical education. Keegan(1983) dismisses this as a

generic term because it emphasises the environment of the learning process rather than the learning process itself. The term is also unacceptable because it does not accommodate the likelihood of learners using the material in a variety of environments. This is particularly important in terms of business since learners may have the option to study in the work environment.

Many Australian educationalists and researchers employ the term 'external studies'. This term not only fails to stress the special characteristics of the learning process but it also overlooks the internal nature of distance education; the learning process is arguably more self-guided than other forms which rely heavily on external stimuli for motivation and reward.

The term 'distance education' comprises distance learning, involving the activities of the student, and distance teaching, involving the activities of the tutorial organisation (Holmberg,1986). Distance education emphasises the spatial and temporal separation of the learners and their tutor. Although this is the major characteristic of this form of education and it is important that it is stressed, perhaps the term should encompass an indication as to the learning process itself. The term 'open learning' implies an ease of access and learning and could therefore contribute to the formation of a more accurate term, for example, "open learning at a distance". However, for the purposes of this thesis which concentrates on the role of distance learning in business, it is the element of separation which is fundamental to the learning process, rather than that of openness. Consequently, as Keegan(1983) concludes;

"...distance education, although not perfect, is the most suitable term and should be used" (p.27).

1.4 FORMS OF DISTANCE EDUCATION

The broad concept of distance education embraces several forms. Keegan(1983) outlines three different approaches to identifying the various forms: 1, the medium on which the learning materials are based; 2, the institutional type and; 3, the didactic model. The use of technical media is represented schematically in Fig. 1.41 below:

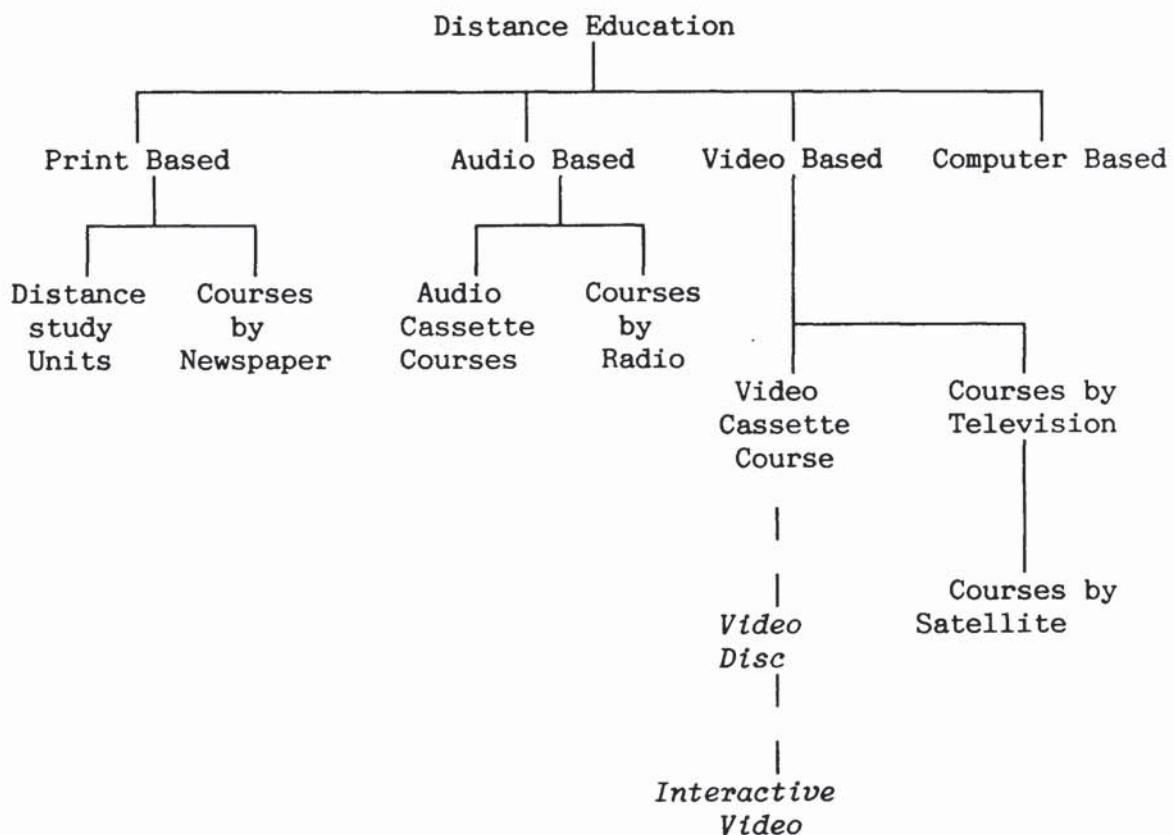


Fig. 1.41 The use of technical media in distance education
(Keegan,1983 p.16).

(The use of video disc and interactive video has increased in popularity since 1983, especially in the business environment; they are have been added in italics to Fig. 1.41.)

In addition, it is important to point out that many distance learning systems consist of a combination of different forms of media. This is particularly true of courses based on high technology, such as video, which rely on print-based media, for example, to clarify difficult areas, suggest further work, outline assessment and study guidance.

Willén(1981) classifies institutions according to the prominence of broadcasting as a media form. She cites examples of centralised and decentralised models of distance education. The former relies heavily on the use of broadcasting media, like the Open University (OU) and the Fernuniversität, W. Germany. The latter has little or no use of broadcasting and depends largely upon printed matter; this is also the case with many Swedish and Australian distance education institutions (Nothcott,1975).

According to Keegan(1983) the second way of identifying the forms of distance education is to refer to the significance of the educational organisation in the planning and preparatory stages of designing the teaching/learning system. He categorises institutions depending upon whether they are sponsored privately or publicly. Models of distance education at the university level are cited by Kaye and Rumble(1981). They designate five different forms of distance education depending upon the type of institution providing the instruction.

First, there is the correspondence tuition model provided by an independent organisation for degrees awarded by a public university and second, the model provided by conventional universities with correspondence tuition for external students. Three variants of the latter model are described by El-Bushra(1973) according to how the distance education is made available to students, namely: in one

department of the university only; in departments accepting internal and external students; or in separate correspondence teaching units dealing with administrative and teaching functions.

Evidently, examples of distance education may encompass elements of more than one variant; the University of Moscow, for example, has departments accepting internal and external students as well as separate correspondence teaching units. Also, the University of New England in Australia combines on and off campus students. It encourages the same tutor-student ratio for external and internal students, envisaging small groups of distance students working alongside their campus peers therefore avoiding the characteristic of industrialisation common to many forms of distance education. (This is the case in most universities in Australia.)

The third model, according to Kaye and Rumble(1981), involves collaboration between various sorts of institutions of higher education, Massey University in New Zealand is an example. Massive centralised state provision for correspondence education at all levels is the fourth model, this is demonstrated by the Centre National de Télé-Enseignement, France. Finally, there is the autonomous institution model established solely for external students, the OU for example. It is this model which Kaye and Rumble emphasise.

They cite several institutions illustrating the autonomous criterion: the Free University of Iran; Everymans University, Israel; Pakistan's Allama Iqbal OU; the Fernuniversität, West Germany; the National University for Distance Education, Spain; Universidad Estatal a Distancia, Costa Rica; the National OU in Venezuela; Athabasca

University in Canada and the Sri Lanka Institute of Distance Education.

To this list, Holmberg(1986) adds the Open Learning Institute of British Columbia (1978); Open Universiteit, Netherlands (1984); Kyongi OU, Korea (1982); Korea Correspondence University, South Korea (1972); Univeritas Terbuka, Indonesia(1984); Sukhothai Thammathirat OU, Thailand(1978); Sri Lanka OU(1981); Central Broadcasting and Television University, China (1978); University of Air, Japan (1983); Open Scholl, India (1980); and the Indira Ghandhi National OU, India (1985).

The features of institutions established especially for distance learners include: integrated teaching, assessment and accreditation functions; total commitment by the institution to distance students with no conflict of loyalty between the distance and conventional students; and an opportunity to initiate new educational programmes and to develop the potential of distance education. Holmberg(1986) stresses the 'innovatory requirements' of formal distance education. These are concerned essentially with the principles of feedback, self-pacing, the opportunity for examinations and a system of credit points. He considers the OU in the light of these requirements and concludes that it appears to be consistent with distance study principles. However, he observes that;

"..... it (the OU) is not a completely uncompromising innovation. It comprises some traditional characteristics that do not facilitate the distance study of adults with professional and social commitments but constitute compromises with conventional thinking"(p.37).

For example, students at the OU cannot begin their studies when they

wish; they must commence at the beginning of its academic year (January). Moreover, the pacing of the learning process is determined largely by the institution in the form of television, radio and assignment timetabling.

According to Holmberg(1986) the Fernuniversität displays even fewer of the 'innovatory requirements' than the OU. Initially, it is more advanced academically than, for example, the Foundation Course of the OU and consequently demonstrates a stricter formal entrance requirement. Furthermore, the pacing system at the Fernuniversität is more rigorous involving predetermined schedules for the distribution of materials and assignments. In short, there is little evidence of individualised study, autonomy or effective didactic two-way communication, concludes Holmberg(1986). The failure to provide the two-way communication;

".... is in my view its greatest weakness at the same time as it constitutes the most tangible difference between its procedures and those of the OU" (Holmberg, 1986 p.130).

Hermods Correspondence School, Sweden, practices the innovatory requirements outlined; it has frequent non-contiguous two-way communication, free pacing, a choice of examinations and credit point organisation. The institution writes courses, provides tuition, holds residential courses and offers counselling services but the examination duties are assumed by a Swedish university.

The third method of identifying the different forms of distance education according to Keegan(1983) is by considering the didactic structure in terms of the provision for two-way communication and the possibility of occasional seminars. He presents the correspondence

school model whereby students receive the learning material by post from the institution. After studying the material, students complete and return the stipulated assignments to the institution. Feedback leading to evaluation is then sent to students.

The Central European model presented by Keegan(1983) illustrates a reduced correspondence element. The institution prepares and distributes the learning materials to the students. Compulsory consultations, usually fortnightly and of two to three hours' duration, ensure the assessment and feedback stages are satisfactory for the student. Information concerning the next stage of learning is also discussed. As the study progresses into the third or fourth year, the frequency of the consultation diminishes. A coherent structure ensures the link between learning materials and successful learning behaviour in the Central European Model. The student is supported by a wide-range of activities which serves to increase the likelihood of learners completing the course.

There are various forms of education which although not considered conventional face-to-face education, cannot be described as distance education. Programmed learning, for example, is a form of indirect teaching that shares certain characteristics with distance education, such as the specialised preparation of learning materials. Whilst it does tend towards an individual form of learning, it does not satisfy the criterion of non-contiguous, two-way communication nor does it attempt to overcome the potential problems caused by the separation of the teacher and learner.

There are certain characteristics of distance education which are met by the Personalised System of Instruction (PSI) outlined by

Keller(1974). The most striking similarity is, perhaps, the reliance on the written word in the teacher-student interaction, essential in both distance learning and PSI. The designers of PSI have the goal of maximising rewards for educational behaviour, minimising frustration, eliminating punishment and fear and facilitating the development of precise discrimination. In order to achieve these goals, classroom demonstrations, discussions, lectures and written assignments are eradicated from the teaching-learning system since effective teaching cannot take place fully under these conditions (Keller,1974). The PSI has four basic components: a reliance on the written word for instructional purposes; self-pacing; progress is contingent on performance according to specified criteria and the use of tutors to help students progress and to provide feedback (Coldeway and Spencer,1982). Small units with accompanying guides are provided at intervals dictated by the individual pace of students. Immediate self-evaluation is encouraged by tests and exercises. According to Kulik, Kulik and Cohen(1979) student achievement is higher than with conventional instruction.

Coldeway and Spencer(1982) examine whether PSI, with well-defined objectives matched to self-study exercises and test items involving small units of material inducing regular feedback, can be incorporated into distance learning. They consider one potential problem to be that of turn-around time which for distance education is approximately two weeks by post (Graff, Saxe and Ostlyngen,1966). This is an unacceptable time as far as PSI is concerned because the learning schedule is too heavily bound by the feedback system. Moreover, since feedback is de-humanised, it cannot serve to overcome the potential problems of isolation and frustration resulting from very structured learning programmes.

According to Robertson and Crowe(1975) and Daniel and Keating(1978), the telephone does humanise feedback. Coldeway and Spencer(1982) investigated PSI supplemented with telephone contact between the teacher and the student. They found it to be effective and concluded;

".... the PSI model can be successfully implemented in distance education using the telephone" (1982 p.59).

They do point out, however, some disadvantages of combining PSI and distance learning. For example, PSI requires flexible pacing. This basic component of PSI may be difficult to implement and to accept in some areas, especially those of a "subjective and diffused nature" (p.66). Consequently in instances where multiple-choice or short answer questions are insufficient another assessment system must be devised. One criticism of the PSI is that it tends to overemphasise low-level cognitive objectives. Furthermore, since the success of this system depends largely upon the quality of the unit tests and the dedication and skill of the tutor, Coldeway and Schiller(1974) advocate extensive tutor training before the introduction of these techniques.

In reference to the 'innovatory requirements' discussed earlier, Holmberg(1985) concludes;

"A system applying the procedures of PSI or the Keller Plan (but not necessarily the thinking behind them) might also be used in distance education entirely congruently with the innovatory requirements" (pp.145-149).

He considers another form of education linked to distance education, namely learning contracts. This is an autonomous form of learning which caters for individual degree programmes, at

for example, the Empire State College, New York (1979). The three principles inherent in this teaching/learning system are: 1, effective learning derives from the purpose and needs important to the individual; 2, learning occurs in varied ways and places; and 3, styles of learning may differ slightly from person to person and from one setting to another (Worth,1982).

Holmberg considers contract learning as an agreement made between teacher and student regarding the curriculum. This enables the student to work alone with contiguous and non-contiguous support from the teacher. He regards this use of as a blurring of the distinction between distance education and traditional education. Evidently, all educational approaches lie on a continuum comprising face-to-face interaction between the learner and the trainer (in which the trainer is the sole source of knowledge) at one end and independent students learning solely from materials without contact from a tutor or peers at the other end. It appears that forms of distance education can be classified according to where they lie on the continuum. The OU, for example, is located near the conventional end of the continuum.

In conclusion, it is necessary to have a framework within which different forms of distance education can be categorised so that the needs of the learners can be anticipated and in order to ease evaluation. Keegan(1983) provides an insight into the criteria which determine how the forms are categorised; he discusses three major criteria: 1, the medium; 2, the institutional type; and 3, the didactic model. Since many distance learning programmes use a combination of print and video for instance, categorising forms according to a particular medium provides nothing more than an indication as to the constraints of the learning programme in terms

of the type of material covered and the budget available. What is more significant, is the criteria concerning the institutional type because the planning and organisational characteristics of distance education influence the achievement and satisfaction of the learners.

However, it is the 'didactic model' which is the most appropriate. The need for two-way communication resulting from the separation of the tutor and the learner is an aspect of distance education which is often taken for granted. This is the most important contributor to a successful learning experience. The term 'didactic' is misleading in that distance education is less authoritarian than this term implies; distance education encourages students to learn for themselves according to their own needs and preferences. Consequently, perhaps the criterion of 'learning model' might enable educationalists, trainers and the students themselves to locate their form of distance education into an operational framework.

1.5 COMPARISONS WITH CONVENTIONAL EDUCATION

Keegan(1983) discusses the differences between distance education and conventional education from the viewpoint of the student. The independence given to students often results in high rates of non-starters and drop-outs. Furthermore, distance education runs the risk of becoming a depersonalised form of education for both tutors and students; Keegan(1983) warns of the possibility of alienation particularly for those individuals who have not been trained to deal with the specific problems related to distance education. It is the responsibility of the tutorial organisation to overcome potential problems of depersonalisation.

Various elements of the distance learning system are compared in the

literature to those of the system of conventional education. This is often an attempt to justify the former by proving it to be at least equal to the latter. The costing of the systems is an example of such a comparison.

1.51 Cost

The economics of distance education compared to those of conventional education has been widely researched (see, for example, Wagner,1972; 1977; Sewart,1981; Mace,1978 and Rosenquist,1975). According to Peters(1973) the cost structures of distance education are quite different from those of conventional educational. It is important to emphasise that whenever a reference is made to the cost of an educational system a precise description of the characteristics of the educational set-up must be established. According to Holmberg(1985) pure correspondence study with a written medium and a large number of students can be inexpensive, whereas courses involving more sophisticated techniques, even if they have equally high student numbers, yield higher costs per student.

Wagner(1972) investigated the cost-benefit relationship of the OU ("the most sophisticated distance study systems known", Holmberg,1985 p.123) compared to that of conventional education institutions. The results of Wagner's study are summarised in Simms(1977 p.357); the average recurrent cost per equivalent OU undergraduate student was little more than 25% of what it was in conventional educational institutions; the capital cost per student in the OU was only 6% of the conventional cost; the resource cost per equivalent undergraduate was 16% of conventional costs; and the average recurrent cost per graduate in the OU is roughly equal to that of conventional students assuming the drop-out rate of the OU was 85%. If the rate falls below

85% the OU is even more economical. Sewart(1981) claims of the OU "up to sixty per cent of finally registered graduate students are graduating" (p.12).

Wagner(1972) found the ratio of fixed to variable cost per student in the OU to be 2000:1 compared to conventional universities. Although, Percy and Saunders(1982) report that;

"It is very clear that the production of distance learning materials written from scratch is characterised by high fixed costs...in relation to variable costs...Inevitably high fixed costs in production result in very high costs per student unless there is a considerable student enrolment"(p 13).

However, Mace(1978) questions the study by Wagner(1972) with reference to the output calculations; he believes that the increase in earnings and the length of this benefit is less for the OU student than that for conventional students because the former is generally older and already established in full-time employment. The input calculations can also be questioned along these lines since the cost of the conventional student being engaged in education is likely to be much greater than that of the OU student since the latter often studies on a part-time basis in such a way as to accommodate full-time employment.

Moreover, as Perry(1976) points out, the OU exists alongside conventional higher education on which it relies for the resources of the majority of its staff who are engaged on a part-time basis and therefore use the facilities, secretaries, rooms and telephones for example, of their chief source of employment. Wagner(1977) explains how the OU was led to identify three sets of expenditure including an overhead component, a course-related component and a student-related

component (pp.237-78).

Rosenquist(1975) examined the cost of courses provided by independent distance study institutions which rely on fees from students for finances. He divided the total cost into two components, course materials (such as capital costs, warehousing and personnel) and student service (such as publicity, postage and tutor fees).

Most of the costing models available divide the total costs into fixed and variable costs depending upon whether and how often the costs alter, according to, for example, changes in student numbers. Dawson(1979) warns that an increase in student numbers can only be justified if an equal contribution is made to the variable costs and the fixed costs of overheads.

Whatever the type of model adopted to cost the distance education system initially, and to compare it with conventional education subsequently, it is imperative to consider the entire system of education rather than only the distance learning materials in isolation. Neville(1980) goes further by rejecting as "meaningless" the notion that comparisons between distance education and conventional training can be made because the distance learning package is seldom self-sufficient since it is only one element in a training strategy.

Nevertheless, several researchers have reached a conclusion concerning the cost-effectiveness of distance education compared to conventional education; according to Mace(1978) OU students graduate more cheaply than students of conventional universities. This finding supports earlier work by Wagner(1977), Laidlaw and Layard(1974) and

McIntosh and Woodley(1974). Lewis(1973) regards the OU as "at least two to three times cheaper" (p.189).

1.52 PERFORMANCE

Meddleton(1964) compared the performance of external and internal students; he found the former to be more successful than the latter. Several researchers have arrived at the same conclusion (see, for example, Feig,1932; Thompson,1930). According to Granholm(1971) it is significant that no research indicates an inferior performance by distance students. Homberg(1985) adds;

"...studies of the effectiveness of distance learning in relation to conventional studies have shown that cognitive study objectives in general and psychomotor objectives aimed at skills in the fields of written achievement (in languages and mathematics for instance) are attained as well by distance study based on the written word as by conventional classes" (p.137).

Such studies have, however, been criticised for their attempt to compare factors which are to a certain extent not comparable, such as the characteristics of the learner, the learning process and the learning environment. Cropley and Kahl(1983) compared and contrasted distance education and face-to-face education in terms of psychological dimensions. The core dimensions of the teaching/learning processes were examined under the headings of: 1, organisation of learning; 2, motivation; 3, learning processes; 4, communication processes; 5, didactic activities and materials; 6, evaluation; and 7, feedback.

In reference to the organisation of learning, Cropley and Kahl(1983) proposed that the forces that set, guide and monitor learning are different in distance and conventional education; in distance

education, for example, the organisation of learning involves the "psychonamics" of distance learning (p.31). These are described as learning activities;

"...propelled by certain forces (such as the wish to learn), which get learning started, steer it in a particular direction, and keep it going even when the first enthusiasm has faded" (p.36).

The authors emphasise the consideration of motivation which they define as those factors regulating the readiness to expend energy on a particular task at a particular time. Face-to-face students, even the unwilling ones, find themselves in a situation where the normal, natural thing to do is to engage in learning activities. Distance learners, in contrast, are in a situation where academic considerations may not predominate and where there is little, if any, social competition. Consequently, distance learners must rely on their own motivational resources.

The learning process reveals differences concerning, for example, the stimuli present in face-to-face and distance learning. Distance learners have few, if any, reinforcing stimuli; the only stimuli present are competing ones, such as family and professional responsibilities. In relation to the communication processes, there is an absence of feedback through body language and consequently, the opportunity for the tutor to modify the flow of information according to the ongoing responses from the learners is severely restricted.

The didactic activities and materials influencing the process of learning in distance education depends primarily on the information channels designed and provided specifically for the distance learner. The learning process has the limitation of reliance on the formal teachers of education without informal contact such as peer

interaction. However, it does benefit from the absence of the undesirable effects of the tutor-learner relationship such as personality clashes. The effectiveness of the learning process is determined largely by the feedback, and therefore the evaluation, that the learner receives from the tutor and the teaching organisation. Motivation, attitudes and self-esteem are influenced by the feedback and they in turn shape future learning. Feedback in distance education is usually formal, strictly task-oriented and abstract compared to the face-to-face situation. It is less geared to maintaining motivation and confidence since it is usually neither immediate nor personal. Cropley and Kahl(1983) suggest that the beneficial effects of feedback in distance education are dependent chiefly upon the learner's maturity, far-sightedness, internal motivation and ability to plan. The absence of these properties in the face-to-face setting can be more easily compensated for than in the distance education setting. As far as benefits of the distance education system of evaluation and feedback are concerned, the learners are in a position to control what is evaluated and thus to encourage increased autonomy and independence from the tutor and the teaching organisation. Clearly, psychological traits such as internal motivation and the ability to self-pace and self-evaluate are valuable in any learning environment; the distance learner possessing these characteristics would therefore be well-equipped for face-to-face education.

1.53 The system

The special characteristics of the distance learning and conventional face-to-face learning as depicted by Cropley and Kahl(1983) are shown in Fig. 1.53.

Fig. 1.53 A comparison between the systems of face-to-face and conventional education (Cropley and Kahl, 1983),

FACE-TO-FACE EDUCATION	DISTANCE EDUCATION
Immediate, personal contact between learner and teacher	Contact through communication media
Teacher can readily adapt to learner's immediate behaviour	Adaptation delayed
Learner's environment is primarily designed to support learning activities	Learner's environment is designed to serve other purposes (distractors)
Metacommunication between teacher and learner	Metacommunication is difficult
Personal relationships can moderate learning	Personal relationship is of little importance
Direct control of learner by teacher is possible	Teacher's influence is indirect
Learning materials can be of low didactic standard	Learning materials must be of high didactic standard
Learners experience limited degree of freedom	Learners experience a high degree of freedom
Wide opportunities exist for imitation/identification learning	Few opportunities exist for imitation/identification learning
Communication need not be planned to last detail	Communication is usually highly planned
Information is provided by a mixture of cues	Information is mainly provided by content and organisation
A high degree of evaluation and feed-back from the teacher	A comparatively low degree of evaluation and feedback from the teacher
Internal motivation, self-direction, self-evaluation, planning, etc. can be low	Internal motivation, self-direction, self-evaluation, planning, etc. must be high
Willingness and ability of learner to work without direct supervision may be low	Willingness and ability of learner to work without direct supervision must be high

Knowles(1975) also compares the characteristics of the teaching/learning process. He portrays the differences between teacher-directed learning and self-directed learning as "poles on a spectrum" (p.60). Although these are extreme examples of both types of learning, according to Knowles, they share characteristics with conventional and distance education respectively (see Fig. 1.532). For example, the assumptions underlying the motivation of learners in a teacher-directed learning situation involves the use of external rewards and punishments, whereas in the self-directed learning situation, internal incentives and curiosity are involved. In teacher-directed learning the learners' experience is built upon rather than used as it is in the self-directed learning situation where it is considered a rich resource for learning.

Fig. 1.532 A comparison of assumptions of teacher-directed learning and self-directed learning (Knowles,1975 p.60).

ASSUMPTIONS		
About	Teacher-directed learning	Self-directed learning
Concept of the learner	Dependent personality	Increasingly self-directed organism
Role of learner's experience	To be built on more than used	A rich resource for learning
Readiness to learn	Varies with levels of maturation	Develops from life tasks and problems
Orientation to learning	Subject-centered	Task - or problem - centered
Motivation	External rewards and punishments	Internal incentives curiosity

Under the heading process elements, Knowles(1975) includes the climate. In teacher-directed learning this is formal,

authority-oriented, competitive and judgemental. Conversely, in self-directed learning the climate is informal, consensual, supportive and collaborative (Fig. 1.533). Furthermore, in reference to the process elements of diagnosis of needs and setting goals, the teacher dictates these in the teacher-directed situation whereas in the self-directed situation the learner participates in the decision-making process, resulting in mutual assessment and negotiation.

Fig. 1.533 A comparison of processes of teacher-directed learning and self-directed learning (Knowles, 1975 p.60).

PROCESS ELEMENTS		
Elements	Teacher-directed learning	Self-directed learning
Climate	Formal Authority-oriented Competitive Judgemental	Informal Mutually respectful Consensual Collaborative Supportive
Planning	Primarily by Teacher	By participative decision-making
Diagnosis of needs	Primarily by Teacher	By mutual assessment
Setting goals	Primarily by Teacher	By mutual negotiation
Designing a learning plan	Content units Course syllabus Logical sequence	Learning projects Learning contracts Sequenced in terms of readiness
Learning activities	Transmittal techniques Assigned readings	Inquiry projects Independent study Experimental techniques
Evaluation	Primarily by teacher	By mutual assessment of self-collected evidence

These recommendations serve to bridge the gap between the assumed characteristics of the learner and the learning process and the

actual provision of distance education. According to Knowles(1975) the nature of the process elements of self-directed learning concerned with the climate of learning are informal, collaborative and supportive. In order to achieve this, it is essential to provide a careful analysis of local support and to implement a sensitive monitoring procedure. Conventional educational methods compared to those of distance education were discussed by Kaye and Rumble(1981). They categorised their findings according to whether the student or the course is affected (see Fig. 1.534).

Fig. 1.534 A comparison of conventional and distance-learning systems (Kaye and Rumble,1981 p.243-245)

DIMENSIONS	"CONVENTIONAL" SYSTEM	DISTANCE LEARNING SYSTEM
1 Students	-relatively homogenous (age and qualifications) -same location (eg classroom) -largely "dependent" learners -controlled situation	-probably heterogeneous -scattered, at-a-distance -independent learners -relatively uncontrolled
2 Student Records	-do not need to be highly developed nor very detailed	-accurate student records essential (addresses, allocation of tutors, assessment grades, correspondence etc)
3 Student Support	-automatically built in to face-to-face systems	-need for special provision of local back-up services to help students with learning problems and to minimise drop-out -ways of bridging the gap between student and central institution need to be designed -distance implies control and response (time) problems to be met
4 Student Assessment and Accreditation	-problems of validity and reliability minimised	-assessment at-a-distance increases problems of validity -use of large numbers of correspondence tutors decreases reliability (need for monitoring)

DIMENSIONS	"CONVENTIONAL" SYSTEM	DISTANCE LEARNING SYSTEM
	-relatively "cheat-proof"	procedures) -cheating/impersonisation a potential problem: credibility
5 Media/ Methods	-essentially face-to-face teaching -labour intensive -teaching skills needed fairly well defined	-essentially "mediated" teaching -capital intensive -skills needed generally not readily available
6 Courses	-relatively simple, few and well-defined creation production and distribution processes -low start-up costs but high student-variable costs; tendency for many options/courses with a few students on each	-more complex, course creation-production- distribution processes with specialised staff functions arising from divisions of labour -high start-up costs but low student-variable costs: tendency for few options with many students per course, to achieve economies of scale (if latter on objective)
7 Organ- isation Admin istration	-little administration support required: vast majority of staff in schools and colleges are the teachers -main administration problem- are concerned with time- tabling of teaching periods and with management of teaching staff (personnel functions)	-strong administration framework needed to link together student support and record functions, course creation functions course production and distribution functions (industrial and quasi- industrial processes) -some specialist functions may need to be carried out outside the system(eg printing, broadcasting)
8 Control Regulation	-conventional problems of planning, scheduling, evaluation, leadership, decision making	-these problems are magnified and in certain cases are qualitatively different (eg capital intensive and multi-media nature of institution imposes longer planning horizons on many more fronts; integration of multi-media creation production-distribution and teaching systems imposes production control)

DIMENSIONS	"CONVENTIONAL" SYSTEM	DISTANCE LEARNING SYSTEM
9 Cost Structure	-basically labour-intensive, and directly and primarily related to numbers of students; unit costs per student/year do not vary significantly with numbers per course	-basically capital-intensive, and related more to course creation and production costs than to student costs; unit costs per student/year drop significantly with increased numbers per course

It is evident that distance learning is located somewhere between independent, self-directed learning and conventional face-to-face, teacher-directed learning on the learning continuum. Brookfield(1983) compared independent learners and correspondence learners in reference to their motives and their resources for learning. For the purposes of his study, independent learning was defined as learning independent of external instructional direction and institutional recognition. He reports an apparent absence of problems for the independent learners probably due to the fact that if they did experience any difficulties they might not be motivated enough to continue. Moreover, what Brookfield classed as "problems" did not necessarily constitute difficulties for the independent learners. The correspondence student had a greater awareness of constraints, particularly those concerned with intellectual and temporal demands and presentational skills.

One interesting feature of his research was the role of spouse support. Both independent and correspondence learners required the "active support" (McIntosh and Morrison,1977) of their spouse in order to continue learning. As Brookfield concludes;

...the term independent learning should not be interchangeable with isolated learning since the physical separation of teacher and student does not automatically grant cognitive independence to the latter" (p.31).

Organised distance education requires an administration framework in order to handle student enrolment, course publicising and the distribution of learning materials. It also requires a creative framework for the writing of materials, the selection of media and supplementary learning techniques and course trial and evaluation. This framework includes a support section concerned with the provision of student counselling, student-tutor interaction, student monitoring and evaluation.

It is evident that there are sufficient differences between distance education and conventional education to warrant a comparison. On the basis of cost, the literature indicates overwhelmingly that distance education is less expensive than face-to-face education; this is particularly relevant to business where training by residential courses is widespread. Clearly, residential courses are much more expensive than distance education in terms of resources, the removal of learners from their workplace and overheads. No costing can take place, however, until factors such as student numbers have been considered. In order for distance education to be cost-effective, significant student numbers are necessary; the actual cut-off point is determined by the writing, production, distribution and tutoring costs. In addition, cost-effectiveness relates to student performance against criteria often imposed by the institution providing the course rather than by the students themselves. The evidence suggests that distance education achieves student performance levels of at least equal to, but often greater than, conventional courses (assuming that the subject matter is actually amenable to instruction through distance learning).

Another vital factor influencing the comparison of instructional

methods is that of student motivation and satisfaction; distance learning relies heavily on a foundation of motivation enabling students to overcome potential problems, such as lack of peer interaction. If motivation is high, the literature indicates that performance is enhanced; if motivation is low, measures can be taken to bridge the divide between conventional and distance education by providing, for example, introductory face-to-face meetings. Finally, the principles of distance education compared to those of conventional education are more suited to the psychology of adult learning and to the overall aim of increasing student responsibility for their own learning development.

2.1 INTRODUCTION

According to Wedemeyer(1973) an open learning system is capable of eliciting, interpreting and analysing learner goals and abilities at the point of entry and throughout the student's participation with the instruction and the learning programme. He acknowledges that it embodies two separate but related programmes, namely the instruction and the learning programme. The learner is able to participate in these programmes with, for example, an academic degree as the reward. As an operating principle the system is capable of accommodating increasing numbers of students without a commensurate increase in the unit cost of the basic learning experience. The system also encourages the employment of different media. Testing and evaluation are used as a means of diagnosing and analysing the accomplishment of the specific learning objectives. Distance is not so much tolerated as encouraged as a positive element in the development of the system's independence. Similarly, the learning conditions of the distance learner are enriched by the absence of time and space pressures.

Kaye and Rumble(1981) discuss distance learning systems according to the key features concerning students, learning materials, methods, logistics and economy. The key features concerning students include an 'opening' of opportunity by the provision of education to a new target population and the identification of specific target groups and their characteristics in order to allow the systematic design of the learning systems.

In reference to the learning material and methods, Kaye and

Rumble(1981) emphasise the flexibility of content and curriculum, the design of learning materials for independent learning and the use of different media. Finally, they indicate the logistical and economic characteristics of distance teaching methods and student groups compared to conventional provisions, including a centralised, high volume production of standardised learning materials and the potential for conventional face-to-face methods.

They do go on, however, to define a general system from which two major operating systems can be distinguished, the course sub-system and the student sub-system. The former is concerned with the design, production, distribution and reception of the teaching materials. The latter is concerned with the management and control of the students as they progress through the system and is, therefore, essentially administrative in nature. Other sub-systems include the regulatory and logistical sub-systems.

It is evident that the system of distance education is determined essentially by the nature of the teaching and learning processes. Keegan(1983) postulates that in conventional education the tutor is responsible for the teaching process whereas in distance education an institution is responsible. Consequently, the author of the distance learning materials may not be required to implement, monitor nor evaluate them. A range of strategies must therefore be incorporated in order to encourage and facilitate the learning process.

The institution providing distance education must take certain policy decisions regarding the character of the conversation and the choice of the learning model to be adapted. The nature of the student-teacher interaction varies enormously from 'contract-type'

learning, requiring extensive personal, face-to-face communication, to a basic course employing self-contained materials and assignments with often preproduced answers and comments. The non-contiguous communication involves written and/or telephone contact, sometimes supplemented by computer or audio-cassette interaction. The frequency and organisation of the communication has been investigated by Bååth(1980), Flinck(1978), Hathaway(1966), Holmberg(1985) and Vincent(1982).

The components of the distance learning system include assignments for submission which provide students with the means of developing and concentrating their thinking (McKenzie,1972). The most highly ranked function of assignments for submission according to Bååth's study (1978) on European Correspondence Schools and the OU was to give the students effective feedback, help them to correct their mistakes and control their progress.

Another component of some distance learning systems is the face-to-face session which is useful as a means of allowing the student to consult the subject specialist, to exchange views with tutors and peers and to discuss feedback on previous work. The University of The South Pacific incorporates face-to-face sessions into the distance learning system by means of tutorial visits to the student's area or even to her/his home, residential courses, student visits to the University and, more recently, face-to-face consultation by satellite (Wynne,1973). Also, Rebel(1987) examined the role of group learning in distance education and concluded that this personal, direct form of communication supports the learner providing attendance is learner-initiated. Scriven(1967) found the learning circle to have a positive effect on the learning process of

adult distance learners by supporting the content, process and context of learning. In addition, the fears concerned with personal change, experience building and motivation identified by Knowles(1975) as important to adult learners, are tackled and overcome to some extent by the learning circle.

Scriven(1967) warns that the learning cycle may jeopardise the learner's independence and autonomy because it is not self-paced. He does, however, propose that the resultant increase in motivation offsets this disadvantage. Moreover, it is worth bearing in mind that group interaction, in conjunction with home-based packages in general, plays a humanising and social facilitating role (Lewis,1975; Wångdahl,1977).

According to Peruniak(1984) the role of the seminar in distance learning is becoming more important "by experimenting with the frequency, duration, location of seminars and their integration with the home-based packages as well as other forms of media" (p.110). It is clear that the component of face-to-face sessions in the distance learning system is an area of contention. Holmberg(1986) advises;

"To be profitable, combinations of distance and face-to-face tuition have proved to need complete integration based on systematic planning allocating the two approaches to well-defined tasks in the study process" (p.54).

Another component of the distance learning system is the distance learning material. The actual presentation of the course is as important as its content in providing a link between the teaching and the learning behaviour. Special principles have been developed including target population analysis, readability research,

procedures for structuring materials and typographical layout. The design of the learning material should encourage learning through interaction in the absence of didactic conversation; Holmberg(1986) attributes the spirit and the atmosphere of the resultant 'conversation' as one of the major characteristics of distant education. The nature of distance education is, therefore, affected by the type of communication involved in the learning problem, namely non-contiguous or contiguous communication.

2.2 THE DISTANCE LEARNER

The most important component of the distance education system is the distance learner. There is a tendency in the literature to characterise students of distance education as an homogenous group; Wångdahl(1980) ventures:

"...the correspondence student is a man, twenty to thirty-five years old and has a higher previous education than the rest of the population," (p.14).

Holmberg(1981), whilst refuting that distance learners form a clearly defined group, proposes that the largest age group appears to be twenty-five to thirty-five years. The comparative study carried out by Woodley and McIntosh(1977) found 92% of the OU students and 18% of conventional UK students to be aged over twenty-five years. However, as Kaye and Rumble(1981) point out, it is impossible to generalise beyond certain characteristics. However, that the age of distance learners is important was confirmed by an investigation by James(1984); he looked at the relationship between the age and the psychological well-being of students. James employed the self-report University College Study Difficulty Questionnaire (UCSDQ) in order to categorise characteristics which influence how individuals cope with

a particular learning situation. The results indicate that the psychological well-being of distance learners consists largely of neurotic and motivational components linked to academic attainment. As age increases so does performance variability among individuals, so that one might find many relatively old people performing at levels at least equivalent to the average of a younger age group.

Woodley and McIntosh(1979) considered age as a factor influencing the performance of students at the OU. They report that students aged between eighteen and thirty years displayed a direct relationship between age and performance during the first year. Older students performed much better than younger ones on social sciences and humanities but slightly worse on science subjects. Eaton(1980) claims that older students tend to opt for humanities and social sciences in preference to pure sciences because these subjects enable them to reflect on and use their life experiences. Morrison(1982) found, in a study of OU students, that the over sixty year olds perform less well in examinations than those aged under sixty years.

In addition, motivation is reported to be significantly higher in those distance learners aged over forty years (McIntosh and Morrison,1974). Moreover, Walberg, Schiller and Hertel(1979) found the degree of motivation reflected the amount of learning that had taken place previously. Those students who had been successful on previous courses had a higher motivational level than those who had low scores on previous courses. The results from a study by James(1984) concerning motivation and attainment reinforces this point; there was a positive correlation for the marks on coursework and the level of student motivation. If the level of motivation was high, difficulties were overcome more frequently and even badly

designed materials were welcomed and used with success
(Neville,1980).

Cropley and Kahl (1983) compared distance education and face-to-face education in terms of psychological dimensions and concluded that internal motivation is "a necessary prerequisite" in the former and "desirable" (p.32) in the latter. Students in a face-to-face situation, even unwilling ones, are expected to engage in learning activities. Distance learners, however, are isolated from conventional learning situations and are often faced with tasks demanding behaviour different from that required of the learning task. The apparent absence of motivating factors is strengthened further by the lack of social competition in the form of tutor or peer group presence. Distance learners must rely on their own motivational resources because tutors cannot adjust learning tasks to suit each specific situation. Students' concepts of themselves are important in determining their ability to think critically, honestly and creatively, as a result students need security, a supportive environment, encouragement and friendship (Rogers,1969). Each of these needs is intensified in response to conditions often forced upon the distance learner.

According to James(1984) many mature students believe it is harder for them to cope with higher education due to an alleged poorer memory and a decline in learning ability. From her investigation into the attitudes of distance learners, Willén(1981) found a third of the students to be confident of success in their studies; this was true more of men than of women and more of younger than of older learners. Woodley and McIntosh(1977), however, found self-ratings on certain personality characteristics to vary with age; the older students were

more likely to consider themselves as above average in "independence and persistence" (pp.3-4). Gottert(1983) found distance learners to be more competitive, achievement oriented and assertive than the general population and other student groups. In addition, several researchers have dispelled the myth that adults do not want or need assistance in planning, defining objectives and improving learning skills (see, for example, Willén,1981).

Rebel(1987) maintains that it takes adult learners considerable time to develop their own learning strategy; during this formative period distance learners need support from the organisation. The early support should involve the individualisation of learning in order to accommodate the personal experience of the learners (Huberman,1974) and should take into account the subjective needs of the adults, the role of career motivational forces and a learning arrangement 'free of coercion' (Rebel,1987). Potvin(1969) states that the information required by the providers of adult education prior to the planning process must include details of individual learners including their educational background, objectives, previous experience and knowledge, interest areas, preference for learning activities and the amount of time and resources at their disposal.

2.3 THE CONDITIONS

Butts and Megarry(1977) examined the conditions experienced by distance learners. They revealed one of the problems to be that of the ignorance of the course writers regarding the learning conditions of the distance student. The greatest difficulty of learning through this form of education cited by students was the pressure of normal work and the conflict over the allocation of time was the second greatest difficulty. Furthermore, a third of the respondents reported

difficulty in finding a quiet and convenient place to study. Some problems of the distance learner stem from the belief that satisfactory learning is only the result of a complex, personal interaction between the tutor and the learner (Neville,1980). Harris and Williams(1977) reported that students placed considerable value on "the lesser competitive element, the absence of distracting social elements" (p.7). According to Holmberg(1981) one of the important aims of distance education is that students develop independence and a capacity for critical study. Indeed, the purpose of education, particularly adult education, is to encourage the student to become a "continuing, inner-directed, self-operating learner" (Kidd,1973 p.47).

Therefore, the greatest impact that distance teaching has on students is that it forces them to become distance learners, engaged in "primarily an individual form of study" (B    th,1982 p.7).

B    th(1982) considers distance education to be well-suited to the needs of adults and compatible with theories of the psychology of learning that depict learning as an individual and active process, not the result of social interaction (Gagn  ,1967), B    th anticipates the need for some sort of external help in learning dependent upon the learners' intellectual skills and the cognitive advancement of the student.

Furthermore, many investigations show that students who choose distance education are dependent upon being flexible in their studies (see, for example, McIntosh and Woodly,1978). The degree of independence and autonomy which should be attributed to the distance learner is an area of debate in the literature. For example, some distance educators leave it to individual students to decide when

they have satisfied their original learning objectives (Delling,1975). If this is the case, the student has a large scope for flexibility and autonomy in the decision-making processes concerned with learning.

The concern to achieve a balance between autonomy and control was discussed by Daniel and Marquis(1975 p.34) thus:

"...if a system has, as its chief priority, respect for the freedom and autonomy of the individual student, it will allow him to choose a course of study wherever he chooses and to finish it at his convenience. The student paces himself, and there is no external constraints although the good correspondence school, whose model this is, will have a system of written reminders, encouraging phone calls and even financial incentives to incite him to keep at it. Nevertheless the drop-out rate or non-completion rate, with such a free approach is usually horrendous (over fifty per cent)...The usual way to encourage students to continue with a course is to provide some form of pacing, ie. to introduce into the system a series of events taking place at fixed times which become deadlines for the students to meet,"(1979 p.34).

It is apparent that being "a student who is physically separated from her/his instructor and from an institution through which the instruction is offered" (Howard,1985 p.170) creates a unique set of learning conditions which are not present in the face-to-face situation. Despite the insistence by Bååth(1982) that these conditions are conducive to adult study, students working away from a supporting institution attempt to learn in an environment where academic considerations may not predominate (Feasley,1983). Willén and Dahloff(1979) identify the constraints as "contextual frames", namely the physical, social and personal pressures under which distance students operate. Students not only have different rates of learning but they also have different emotional reactions to the learning situation; attention and interest, for example, are

consequences of successful learning experiences. Dodds, Lawrence and Guiton(1984) elaborate this idea claiming that students bring to the learning task a set of frames, such as family responsibilities. Once they become students, another set of study-oriented contexts operate, in the form of relationships with academic staff, for example. The investigation stresses, nevertheless, that the study-related contextual frames may then be subsumed into the personal frames; many students regarded external study as a means of fitting university work into other pressing commitments.

Indeed, several researchers have indicated the learning obstacles facing distance learners (see for example, Idle, Kennedy and Brown,1978; Megarry,1979; Howard,1985). The findings of such investigations can be categorised broadly into social constraints, like the pressure of normal work and insufficient time; course-oriented constraints, like the design of materials and lack of library facilities, and learning behaviour constraints, like the absence of immediate feedback, arresting fatigue and maintaining motivation.

Boyd and French(1980) consider the most significant influence on the student's perceptions of their external study behaviour as family and job demands. Sansom(1981) compared reasons for withdrawal and found personal and employment considerations the most widespread amongst external students and university experience and poor motivation amongst internal students. According to Saklofske, Teather, McKerracher and Carr(1977) there is no significant difference between distance and face-to-face students in their expressed self-perceptions; both groups felt they had conducted a great deal of work related to their courses which they regarded as extremely useful.

There is a mixed response to the question of whether the resultant conditions of the distance learner actually affect performance. Employing reading patterns as indicators of subsequent success, Meddleton(1964) claims external students are less successful than their campus peers. More recent evidence has yielded similar findings (see for example, Swain,1977; Smith,1978). Willén and Dahloff(1979) believe the level of productivity and the study techniques adopted are influenced by the conditions. James(1984) confirms that various academic environments produce differential effects and that the relationship between the academic attainment and the personality of students in their environment is complex. He defines the academic environment according to the organisation of the curriculum, the teaching-learning arrangement, the students' knowledge of the goals and their progress towards achieving them, the methods of assessment, staff interest and support. A stable and suitable environment led to superior performance in the over thirty year old age group. These conditions, moreover, enabled this group to become better psychologically equipped for distance learning.

2.4 THE TUTOR

According to Juura(1977) it is important to differentiate between the kinds of distance learning tutors. He divides them into four groups: full-time tutors working as part of the administrative machinery of the institution and involved in the preparation of materials and the tutoring of students; part-time freelance tutors; full-time tutors teaching external and internal students and tutors who occasionally supervise distance learning.

Holmberg(1977) divides distance tutors into three categories depending upon the type of contact taking place between the tutor and

student. The first category comprises those tutors who use tutorial letters and/or telephone calls, for example. The second category concerns those tutors who have regular personal consultation with the student in the form of face-to-face tutorials. The third category includes those tutors who occasionally practise concentrated tutoring, for example, residential courses at the OU. He goes on to categorise distance teaching organisations into two groups, depending upon their attitude towards student assignments. One approach involves only the correcting of assignments whilst the other requires the tutor to display a comprehensive appreciation of the student's work in order to make the student aware of the different interpretations, views and positions concerning assignments.

In order to establish whether previous teaching experience is a necessary prerequisite for distance tutoring, it is important to examine the functions involved in this role. Bååth(1982) maintains that distance learners need initially the same help as other adult learners, namely: in defining goals; in selecting appropriate learning materials, relevant to the student's goals and previous knowledge and experience, as well as to the structure and content of the topic area; and in solving the difficulties arising from the learning conditions.

However, primitive notions of the task of distance tutors are often concerned with the necessity to correct and amend the student's achievement; some tutors dwell on formative evaluation and feedback. Admittedly, the evaluation of students' work is crucial as a measure of proficiency against standards set by themselves, peers and tutors. It does, therefore, form an integral part of the learning process not simply a measure of the level of learning attained.

However, grading students according to their so-called progress against predetermined standards endangers the interaction necessary for the conditions that favour and facilitate learning. The process of assigning a grade results in a delay in the learning process which in turn removes the focus of attention from the learning activity to the assessment procedure (Holmberg,1977). Nevertheless, the assessment procedure is significant since the learner is forced to wait for feedback from the tutor in the absence of immediate feedback as in the face-to-face situation. The time it takes for the student to receive feedback, frequently referred to as the 'turn-around time', is therefore very important in distance education.

Rekkedal(1985) found a correlation between the time taken for students to receive their feedback on assignments and completion rates. He reported that quick handling of assignments resulted in increased completion rates whereas a turn-around time of more than a week resulted in complaints from the students. Haagman(1970) claims normal turn-around time for distance learning courses to be between two and four weeks.

B    th(1982) emphasises that distance students also need special help

at the start of the course; evidence suggests this is crucial in influencing drop-out rates (see for example, James and Wedemeyer,1959; Pfeiffer and Sabers,1970; Rekkedal,1972; Bååth,1980). Similarly, the motivational and adjustment aspects of the tutor's role are highlighted by Nicholson(1977); he considers these functions, along with increasing knowledge and skill levels, as fundamental to the welfare of the student and the efficiency of the educational system. Childs(1957) adds the need for the tutor to inspire the student.

That different students need different structures and different supportive measures was one of the conclusions reached by Willén(1981). Moreover, this supportive function cannot be met by television or radio programmes, however excellent they may be (Bates and Pugh,1975; Bates and Callagher,1976).

Four functions of the distance learning tutor are outlined by Lampikoski and Mantere(1975), namely: 1,instructive activity (advice, explanations, for example); 2,motivational activity; 3,systematic activity (arranging materials, for example); and 4,evaluative activity. These activities may initially overwhelm the inexperienced distance learning tutor both in terms of physical and psychological workloads. In addition to the problem of workload, there is clearly a threat to the tutors' perceived definitions of their role. Nisbet(1974) talks of 'deskilling' which occur when elements of previous experience become irrelevant; he predicts an unhappy sequence of increasing workloads, loss of confidence, anxiety, confusion and disillusionment. Peters(1973) moves away from the notion of a personal relationship between the distance learner and tutor. He considers them to be controlled by technical rules, rather

than social norms as in face-to-face contact. There is a limited possibility of analysing student needs and direction in distance education; conventional education accommodates expectations built on personal contact; goals are achieved by efficiency, rather than through personal interaction, as in the case of conventional education.

Some researchers have investigated whether a personalised system of distance learning instruction has a positive effect on student performance. One example of personalising the relationship between the tutor and the student is through telephone contact; Flinck(1978) found students felt less isolated as the frequency of telephone contact increased. Moreover, students are reported to prefer courses with the opportunity for this kind of contact. Rekkedal(1985) examined the consequences of a personal tutor-counsellor system. The experimental group included introductory letters, a short turn-around time, telephone contact and a student-tutor ratio of 1:1. His results revealed that,

"...the students in the experimental group had a higher completion rate and a larger number of study units and courses during the experimental period" (p.13).

Holmberg(1986) states that some tutors prefer a more neutral approach in order to avoid interfering in the learning situation. He advocates the use of pre-produced or pre-programmed tutoring modules in instances where tutors believe there to be common areas of misunderstanding. The experiences of pre-produced tutors' comments are mixed. The possibility of no tutor within the system is proposed by Harris and Williams(1977);

...with certain kinds of course or course objectives (such as with revision or some forms of in-service training) it is possible to dispense with the tutorial element" (p.23).

Graham(1969) looked at the ratings of student attitudes to the distance education system regarding its instructional, activating and motivational value. The work of the tutor was ranked the lowest; the text and the self-assessment exercises were ranked more highly. The research of Glatter and Wendell(1971) supports this finding with only a minority of their sample feeling as though they had someone to turn to during their course.

The personal style of the tutor is important (Gibbs and Durbridge,1976). They found most of the tutors who were popular with the students to be understanding, informal, flexible and interesting. The three essential attitudes of the tutor are outlined by Rogers(1972). These are 1, realness and genuineness:

"Thus, he is a person to his students, not a faceless embodiment of a curricular requirement not a sterile tube through which knowledge is passed,"(p.59);

2, care and trust and 3, empathic understanding:

"When the teacher has the ability to understand the students' reactions from the inside, has a sensitive awareness of the way the process of education and learning seems to the student, then again the likelihood of significant learning is increased" (p.61).

It is therefore an advantage if the tutor is not only familiar with the course and subject area but is also in a position to respond to the students' anxieties in a supportive and sympathetic way. In

addition, Bates(1974) stresses that the tutor should take part in the course evaluation.

It is important to acknowledge that not all distance learning tutors perform the same function; the function of the tutor depends on the 'contract' between tutor, student and institution. In some institutions, the tutor is responsible for the creation and administration of courses as well as their monitoring and evaluation. Other institutions are organised in such a way as to encourage tutors to concentrate on the two-way communication between themselves and their students. The most important characteristic of the tutor's role is that of understanding the learning experience from the perspective of the student. This understanding manifests itself in verbal and written contact and in more formal interaction in the form of feedback regarding the subject matter and the objectives of the course.

Individual communication between tutors and students may go some way in avoiding potential problems faced not only by students but also by tutors. For example, the role of distance learning tutors is significantly different from that of conventional tutors; tutors relying on face-to-face interaction with students can give immediate feedback in response to implicit - as well as explicit - cues from students. These cues demonstrate the progress made by students and enable tutors to control the pace of learning. The element of control in distance education as far as tutors are concerned is greatly reduced; they often receive negative feedback from frustrated students. Therefore an individual informal relationship between tutors and students serves to reassure both parties; tutors basing their understanding on the individual characteristics and objectives

of students are rewarded by greater involvement in the learning experience than would otherwise be achieved through anonymous, predetermined tutor comments. A personal, friendly and supportive relationship has been shown to improve performance, lower drop-out rates and reduce loneliness. In short, the tutor must be "a supervisor or counsellor for do-it-yourself learners", "an assistant for the course writer" and "a full partner in the educational process" (Harris and Williams, 1977 p.24).

2.5 MEDIA

Various types of media are used in distance education systems even though the majority of learning packages rely heavily on print. The nature of the media employed can be considered under two headings according to its functions: two-way traffic involving the provisions of interaction with the tutors for fellow students; and one-way traffic involving the presentation of material. It is important to point out that the interaction in two-way traffic can be student-initiated (for example, asking questions and making comments about the course) or tutor-initiated (for example, assignments for correction).

Butts(1981) regards micro-technology as the good fairy with rapid advances of technology in education easing the difficulties besetting distance education by improving and increasing telesoftware. Indeed, information technology has meant personal computers are able to be linked through an extensive telephone system to distance databanks; Plato IV at the University of Illinois is an example of computer-assisted learning. Communication through computer programs, as opposed to face-to-face, telephone or written contact, appears to be an increasingly popular means of providing feedback and therefore

'interaction' between students and tutors. Hermods, Sweden, uses computers in off-line systems as a means of correcting and commenting on multiple-choice questions. Personalised response letters were printed as part of the communication system. Bååth(1982) found that students using this system submitted assignments earlier, completed their studies sooner and more frequently and demonstrated more favourable attitudes to responsive comments than their conventional learning peer group. Nevertheless, although computer feedback is useful in instances where correct answers cannot be disputed and where no discussion is needed, it fails to individualise the feedback process.

Information technology becomes even more meaningful when used in combination with a more traditional media forms, as with the micro-computer and the telephone, for example. CYCLOPS (McConnell,1982) is a combination used by the OU, it involves conference tutorials by telephone combined with micro-computer technology. Telephone counselling is beneficial in that it provides immediate feedback, although it is not a permanent record so it cannot be referred back to by students for correction and revision purposes. Holmberg(1986) states;

"....the telephone is mainly a supplementary teaching medium and remains so even if it is combined with teletransmission of written elements" (p 56-7).

There are other forms of high-tech media including the use of satellite communication networks that enable distance tutors to be in voice contact with their learners; satellite communication is employed currently at the University of the South Pacific.

The presentation of the learning matter is a larger area of involvement for information technology. This is interesting particularly in light of the fact that the total number of individuals familiar with micro-computers in the UK among the twenty years and under age group will soon exceed the total number from the rest of the population. Ironically, it is suggested that this young age-group is the one less able to cope with the conditions and requirement of distance learning (Rekkedal,1983).

With this in mind, Boyd(1982) identifies three ways of providing computer-assisted learning (CAL): 1, to teach knowledge and skills (however, the provider of this method has power over the learner and that it may "reinforce schizoid entrapment in bureaucratic entities and alienate private lives" p.1); 2, to include open access and auto-elaborative CAL (creating "opportunistic turbulence" and power for the young); 3, to offer gated-access collective elaborative CAL (reinforcing and extending cultural groups to provide "some real hope for the future", p.1).

Boyd(1982) also examined distance education using radio. He concluded that it is still vital as a means of providing information in rural regions of the world, especially in the industrially developing countries and its cost is relatively modest. However, Perraton(1982) considers broadcasting to be an unpopular medium of distance education.

The use of the television was examined by Hawkridge(1987); he found that as a form of medium it was "liked when its content was closely related to the course, and disliked when it tried to amuse and entertain"(pp.40-41). One advantage of television is its pacing

influence over the students; Holmberg(1985) proposes that pacing by television serves to keep attrition rates low. Neil(1981) adds;

"...the more complex the institution's media mix and support systems are, the more pervasive the argument (for pacing) usually is" (p.118).

Another form of medium which is used essentially for the presentation of material is the audio-cassette. The use of audio-cassettes was investigated by McDonald and Knights(1979) as a means of instructing students in the operation of electronic equipment. A reported advantage of audio-cassettes over the written word was the increase in motivation through the stimulating presentation of the information; they claim that the isolation and decreasing motivation often experienced by distance learners was counteracted by the sound of a voice in 80% of the respondents. Furthermore, audio-cassettes are easily accessible; Yule(1987) reported that 93.1% of the 23,997 students in his sample had access to audio-cassettes. Engel(1976) found students prefer to use audio material in their own homes rather than on campus.

In conclusion, Holmberg (1985) doubts the usefulness of modern information technology for verbal messages;

"There can be no doubt that for all serious study the reading of the printed material will remain a prime medium, often in distance education in combination with audio-recordings" (p 58).

However, this approach is too inflexible for the purposes of distance education when the needs of individual learners may dictate the inappropriateness or inadequacy of print as a medium of instruction. For example, courses involving interactive skills such as counselling

may benefit from the use of interactive video as a means of demonstrating verbal and physical behaviour. However, it is clear that neither the individualisation nor differentiation of media choice according to learner characteristics been achieved in the majority of cases. This an obvious area for improvement in the application of distance learning since an important aim is to increase learner-independence and control.

2.6 ADVANTAGES AND DISADVANTAGES

The advantages of distance learning stem from the separation of tutor and learner. The enforced independence of students provides them with the opportunity to learn by methods consistent with their preferences. According to Idle, Kennedy and Brown(1978);

"...students cite many advantages in studying externally including the opportunity to organise their own study schedule, saving of time and self-pacing,"(p.292).

Cronbach and Snow(1977) observed that students with "constructive" motivation tended to benefit from the "freedom and challenge" inherent in a learning situation which lacks rigid structure. Both students low in self-confidence and anxious students benefited "when allowed to study their own way, especially on more difficult tasks"(p.469). Clearly, one advantage of distance learning is its flexibility in structuring packages according to the characteristics of individual learners.

According to Harris and Williams(1977) distance learners primarily value the control over the pace, situation and sometimes even the content of their learning programme. Moreover, they are able to plan their study to suit other, perhaps more pressing, work (Glatter and

Wedell,1971). This is cited as the most common reason for enrolling on distance education courses (see, for example, Goorhuis,1977; Wångdahl,1979; Bååth,1980).

Nevertheless, distance learning provides the answer to many of the problems and anxieties of adult learners. There is evidence to suggest that distance learners are attracted by the less competitive elements and the absence of the distracting social factors displayed in the conventional learning situation; Flinck(1978), from his study into the reasons given by students for using distance learning, revealed that the most important reason cited by 63% of respondents was "a predilection for individual work". The option of individual guidance and contact by tutors and peers is also regarded favourably (Harris and Williams,1977). Boyd and French(1980) reported a preference for learners to study with a combination of face-to-face and distance techniques.

When discussing the advantages of distance learning, Wedemeyer(1976) includes the following features: a student-determined rate of progress; an adoption of individual differences and a continuity of supply. Glatter and Wedell(1971) found the convenience aspect of distance education to be the next most cited advantage, after the freedom and control aspects. There is little unproductive time spent travelling or waiting for courses to become available. Despite the fact that it may be regarded as a convenient way to study, it appears to pose problems for some learners.

When non-starters are included in the figures for non-completion the rate is often around 50%, although it is generally higher (see, for example, Noffsinger,1926; Brittain,1970; Pfeiffer and Sabers,1970;

Rekkedal,1972; Houtcoup,1981). Different courses reveal a variation in drop-out rates (Bååth,1980) with the highest demonstrated in psychology, sciences and social science study courses and the lowest in mathematics and foreign languages. This result, however, may be attributable in part to the learning strategy of students who decide, for example, when they have reached their own learning objectives (Brookfield,1983).

Drop-out can be alleviated to a certain extent with the provision of extensive assistance at the beginning of the course (see, for example, James and Wedemeyer,1960; Pfeiffer and Sabers,1970; Rekkedal,1972). Indeed, Rekkedal(1983), who prefers to talk in terms of completion rather than drop-out rates, states;

"...non-completion is not a more serious problem in distance learning than in part-time education based on other teaching-learning methods"(p.19).

He goes on to demonstrate certain factors that are related to persistence on distance education courses, such as age; those aged over twenty-seven years are more inclined to continue their distance education studies than those of a younger age. The level of previous education is also indicative; the greater the level of previous education, the greater the completion rate. The most striking single indicator, however, is determined by the learner's previous experience of distance education; learners with previous experience are more likely to complete the course than those without experience.

For those students who do not complete the course, the main reason for discontent seem to be related to "circumstances outside the immediate control" of the educational institution, such as

insufficient study time, unsatisfactory study conditions and personal domestic reasons (Rekkedal,1983 p.21). Brookfield(1983) supports this; 89% of those withdrawing from external studies reported that they could not concentrate on their work and that they needed more time than they could afford.

Distance learners, clearly, experience difficulties associated not only with studying in isolation but also with settling uncertainties regarding their learning abilities (Brookfield,1983). Dodds, Lawrence and Gupton(1984) found evidence of the "need for self-direction and organisation"(p.81); they point out that the former must be considered as a burden as well as a benefit to distance education since distracted learners are not re-motivated by obligatory confrontation with the tutor or course content. Thus, the necessity for study guidance and counselling cannot be overemphasised. Some of the problems can be attributed to the design procedure, when careful consideration of the consistency and coherence of units and non-print material, for example, might contribute to a better understanding of the learning materials (Butts,1981).

In conclusion, as far as distance learning in business is concerned, the control over the nature and uniformity of the course can be great since objectives are usually determined by the training department, rather than individual learners. A wide range of courses can be designed to meet the training needs of, for example, the management, administration and clerical staff. Wynne and Adamson(1980) considered the training aspects of distance education indicating that its rationale within a business setting includes common core courses being limited to relevant personnel only and local managers accepting greater responsibility for branch training demands. In short,

distance learning is a flexible method of meeting training requirements.

From the individual's point of view, the rationale for distance education can be attributed to the idea that it is well-suited to the needs of adults regarding their study and learning characteristics. Moreover, its practical nature enables learners to combine study with full-time employment. Percy and Saunders(1982) argue that distance learning it can enhance regional collaboration so that it is accessible by the unemployed, the isolated, the handicapped and elderly house-bound people. However, it is ironic that the same characteristics that make distance education beneficial have in some instances the potential to lower student motivation and consequently their persistence:

"...personal and environmental factors are more significant for the individual student who works without ready interaction with university staff and peers" (Dodds, Lawrence and Guiton,1984 p.174).

It is worthwhile pointing out that this provides only a general indication as to the advantages and disadvantages of distance education; the research cited here is largely specific in nature and is, therefore, only reflective of the students, institutions and learning materials involved in each investigation. It is, however, important to be aware of the strengths and weaknesses so that they can be enhanced and minimised respectively by detailed consideration of the needs and characteristics of a particular learning population before the course is designed.

3.1 INTRODUCTION

Undoubtedly, instruction is an integral part of any teaching/learning system. According to Gagné(1967) instruction is defined as;

"...the institution and arrangement of the external conditions of learning which will optimally interact with the internal capabilities of the learner, so as to bring about a change in these capabilities," (p.44).

However, there appears to be no learning theory formulated which is comprehensive enough to provide infallible prescriptions for the design of instructional material (Henderson and Nathenson,1976). In the case of distance education, any discrepancies in the instructional materials cannot be compensated for in the face-to-face learning situation, consequently the function of instruction takes on a new dimension. It constitutes a link between the teaching and the learning behaviour and enables two-way communication of a limited didactic nature to occur.

Instruction provided largely as self-contained materials, perhaps involving different types of media, has several functions including gaining the attention of the learner. This is important particularly in distance education where, in the absence of social pressures, like peer and tutor interaction, the instructional materials must encourage learners to consult the materials initially, then integrate the information presented into their existing knowledge repertoire. This has obvious implications for the design of the distance learning package. It is insufficient to inform the learner; the material must interest, inspire, motivate and also maintain the attention of learners. (Appendix I and Appendix II show examples of advice

concerning layout and style respectively which might be given to potential designers of distance learning materials). The instruction must ensure that learners know exactly what is expected of them with reference, for example, to the objectives of the materials. In order to meet the objectives, it is often necessary to recall the previous knowledge and experience of learners. Furthermore, it is essential that on commencing the materials learners are confident that they possess the prerequisite knowledge and experience. The tutor, along with individual learners, is responsible for establishing and assessing these levels. Conducting an analysis of the target population is one way of understanding the potential problems of the distance learners in question. The provision of guidance in the form of study skill hints and suggestions on how to cope with the special learning conditions and requirements of the particular course is advisable.

The learning behaviour of the student must be elicited, monitored and assessed by the form of instruction employed. The need for feedback, immediate or delayed, is paramount in distance education if learners are expected to continue. Feedback is also important in order to enhance the retention and transfer of learning. In short, the rationale for instructional design is the acquisition of various abilities according to the performance and/or learner objectives, external conditions and also the choice of media. The instruction is planned so that the components merge with the management system forming an instructional delivery system. Finally, the entire system is subject to evaluation (Gagné, 1967).

Gagné (1967) emphasises the influence of the different kinds of learning when selecting appropriate instructional devices. He insists

that the instructor must be guided by different techniques for different kinds of learning not by general rules. In addition, Snow(1977) proposes that instructional development should be aimed at different kinds of learners not at the mythical average. He suggests that instruction can serve to raise the aptitude level of less able learners. Irrespective of aptitude levels, motivated and independent learners require less structured materials than able, conforming but anxious learners who prefer learning from detailed structure, explicit objectives and clear outlines and reviews. Snow concludes;

"...one can choose to ignore student individual differences, but they will be there influencing instructional effects whether they are measured or not", (1963 p.102).

3.2 POTENTIAL PROBLEMS

The importance of individual differences in instructional design is intensified when distance learning materials are involved since the simulated interaction must encourage all learners to engage in active learning in spite of any differences in their experience, educational background, motivational levels and learning objectives. The course designer is exposed to problems peculiar to distance learning in addition to those problems affecting the design of instructional text in general, such as time scheduling.

The specific problems associated with the design of distance education are concerned with the staff and the students. Regarding the staff, Meacham(1982) suggests that team members might interpret distance education as a threat to the perceived definitions of their role within the system. Eastcott(1981) identifies several implications of an introduction of the distance teaching/learning process. He postulates how the responses of the academic staff vary

as self-oriented concerns are replaced by task and then impact orientation. Furthermore, he stresses that changes in the medium and methodology of instruction constitute a personal experience involving the feelings, needs and perceptions of its participants. In order to avoid consequences like those described by Nisbet(1974), the necessity to develop competency at a new skill and maintain the motivation of all participants in the system must be taken into account.

Hall, George and Rutherford(1973) categorise these responses to the introduction of distance learning according to whether they concern the self, the task or the impact of the innovation. The significance of this approach to educational changes is the implication that since in the majority of instances a variety of stages of concern will have been reached before the introduction of the innovation, the feelings of the staff and the development of effective instructional design rarely commence from a common starting point.

Meacham(1982) concludes by warning that the success of the educational innovation depends primarily on the nature of the audience and the time of introduction. It is a question of bridging the gap between the behaviour necessary to bring about an improvement in instructional design and the competencies and concerns of the participants. According to Prime(1973) the recruitment of participants of "the best appropriate trade or professional quality who have had good practical experience, preferably at a responsible or executive level"(p.23) is one method of overcoming problems associated with the introduction of distance education. He considers this important in the light of the special abilities required of individual course creators and also the collective effort of the

participants involved. The matching of the skills of the staff and the skill requirements of distance learning course design is essential in light of the additional demands placed upon those involved, such as student counselling and personal feedback.

According to Bates and Pugh(1975) the course team approach illustrated by the OU ensures 'quality control'. This approach advocates the clear specification of objectives and the identification by the course team of suitable media required to deliver the learning materials. The course is structured in such a way that it is compatible with the needs of the learners. Bates and Pugh(1975) note that;

"A structured learning situation is probably necessary in the early stages of a student experiencing self-instruction, but there should be a gradual progression from a structured situation to a situation where the student himself is able to organise instructional learning materials from various sources, into his "own" learning package" (p.55).

As far as students are concerned, it is important to consider the motivation of distant learners who may be distracted by domestic and professional responsibilities. Some of the problems of designing multi-media courses from the perspective of the students are also discussed by Bates and Pugh(1975). The most common problem is that of overloading learners; it is more difficult for distance students to opt out of the system and feel confident about it than it is for campus students who benefit from peer reinforcement. Distance learners also have a tendency to carry out the bulk of the work around their assignments at the expense of a regular work schedule. The provision of a fast and efficient tutorial service assists learners in pacing themselves by ensuring that they do not have

non-productive periods whilst waiting for feedback from previous assignments.

In conclusion, it is important to be aware of the limitations of this form of instruction in that there is some debate in the literature regarding the effectiveness of providing anything other than knowledge-based packages. It is essential to emphasise that the design of distance instructional materials therefore concerns not only the micro-factors, such as, the choice of media and the structure of the materials, but also the macro-factors such as the recruitment of the course team and its perceptions of innovatory change. As Diamond(1975) states;

"Without a supportive climate and committed administrative leadership, even the most talented staff, following the best possible practical procedures, will have little chance of success"(p.64).

3.3 FACE-TO-FACE SESSIONS

During the planning stage of preparing a distance learning course, it is vital to decide whether there is a need for face-to-face sessions and if so whether there are the resources to satisfy this need. Holmberg(1977) discusses the inclusion of face-to-face sessions in distance education and concludes:

"It is particularly popular among those who know little about the potential and methods of distance study, probably because the oral element is regarded as a safety measure capable of making up for any deficiency in the self-study of students," (p.11).

There are researchers who do not believe that face-to-face sessions detract from distance education, rather that they complement it. This is true particularly of those distance educators concerned with the

provision of technical distance education (see, for example, El-Bushra,1973; Prime,1973). The term 'technical education' encompasses many skills, certain manual skills involved in engineering for example, as well as secretarial skills and other commercial skills. It is arguable that there is in these instances a case for the introduction of face-to-face sessions. Interactive skills, speaking a foreign language or counselling, for example, are widely accepted as requiring an element of face-to-face consultation.

However, the diverse nature of technical education renders its integration into theoretical knowledge-based learning problematic. Fakes(1973) postulates that theory must be distinguished from skills and learned separately by alternative methods since although distance learning can teach a certain amount of practical material, the theoretical components are most amenable to instruction in this way.

Having decided that it is useful in particular instances for distance education to be augmented with face-to-face sessions, it is a question of investigating the different forms of face-to-face sessions available. In order to practice skills which are largely practical or interactive in nature, there is a case for maintaining learners in the working environment, assuming that they are engaged in activities directly related to the course content.

This procedure is adopted by the Technical Correspondence Institute of New Zealand where the course is developed and graded in such a way as to complement the learner's existing level of expertise. Guidance and learning reinforcement is gained during the working day from competent colleagues. The theoretical issues might also be addressed in this way. In addition, learners are required to attend a practical

class usually for a total of three weeks in the first three years of the course (Prime,1973).

Short, intensive weekend practical sessions are also a compulsory element of studying for a technical degree in the USSR. Students are required to attend sessions for thirty days during each of the first three years and forty days during the remaining three years of the study period. This system appears to serve to build on the knowledge, and the limited skills, gained as a result of the correspondence course and the skills achieved through the intensive face-to-face sessions, with on-site experience gained in the working environment.

It is important that the inclusion of face-to-face sessions and practical work does not intrude on the independence and autonomy of the student, otherwise the very nature of distance education might be jeopardised. In the case of the time taken off work to attend practical classes in the USSR, the absence from the workplace is regarded as paid leave. As a result, the potential problem of resentment, and therefore declining motivation, is at least partially avoided.

The question of whether face-to-face elements are compulsory or voluntary is an important one. Ideally, they should be voluntary in order to maintain motivation and consequently improve performance (see, for example, Peruniak,1984). In addition, there are several considerations to be taken into account. For example, Muller(1977) refers to significant groups within his sample who wanted to work by themselves, without face-to-face contact. Ness(1977) reported that learners with more educational background tended to prefer to work on the home-based materials without face-to-face interaction, whereas

Peruniak(1984) found the reverse to be true. Ness(1977) found that older learners tended to choose a combination of distance education and face-to-face sessions. Obviously, the frequency of the arranged meetings and the size of the groups influences whether voluntary face-to-face sessions are financially viable. This decision is also influenced by the opinions and preferences of those implementing the sessions; will they be conducted by subject specialists, counsellors or by the students themselves?

The relationship between the distance education elements and the conventional face-to-face elements of the system is illustrated with the example of residential courses conducted at institutions ordinarily associated with conventional learning; the facilities are shared and the face-to-face sessions take place when the institution is closed to conventional teaching practises. El-Bushra(1973) cites such a relationship from her study of residential courses at the Centre National de Télé-Enseignement.

Residential courses have a role to play in distance education; individual counselling can be very important for both subject and non-subject related concerns (Holmberg,1977). Holmberg goes on to recommend, with reservations, the inclusion of residential courses into a distance education programme. He advocates that they might serve as a refresher course or as an introduction in order to establish and overcome any potential areas of discrepancy between the needs of the learner and the requirements of the course before the course begins proper. Similarly, they might serve as a bridging device between two distance education courses or between a conventional course and a distance education course. Face-to-face interaction provides a framework for private studies, enthuses and

stimulates thinking and encourages a critical attitude.

Lewis(1980) examines face-to-face sessions as a means of assessment. He claims there is scope for formal assessment through checklists of steps within, for example, a particular skill, as well as informal assessment by observation of student behaviour and peer group interaction.

There are forms of face-to-face interaction which are worthy of mention; the learning circle (Scriven,1967) involves bringing students together in order to discuss individual objectives and how they might be achieved in the light of the learning process; the seminar involves group interaction playing a humanising and social facilitating role in conjunction with regular home-based course packages (Lewis,1975; Wångdahl,1977). Other examples include informal student meetings instigated on the initiative of the students, formal tutor-student interaction through one-to-one discussions with a proposed agenda and informal tutor-student interaction through social visits and meetings.

It is necessary to emphasise certain points regarding face-to-face sessions. First, they are not a vehicle for overcoming the inadequacies of poor course design, consequently there is no reason why all distance education programmes should include face-to-face sessions. Second, the need for such an inclusion must be established, initiated either by the tutor/organisation in answer to subject skill requirements or preferably by students as a response to a demand for interaction with fellow students or tutors. It is important therefore that there is provision for face-to-face sessions built into distance education programmes, particularly if there has not been extensive

research into student characteristics before the design and implementation of the course. This in turn calls for the inclusion of an ongoing means whereby the needs and demands of individual learners can be identified and met; this can be achieved by, for example, regular informal written and telephone contact or informal interviews and discussions.

Third, face-to-face sessions have a role to play in learning both knowledge and skills even though they are associated more commonly with the latter. Fourth, they also have a role to play in both subject and non-subject related aspects of the course.

Finally, in order for the face-to-face sessions to achieve their objectives, it is advisable to make them a voluntary part of the distance education programme. This arrangement accommodates those learners who do not consider face-to-face interaction compatible with their own learning preferences; they might, for example, have chosen distance education because they felt uncomfortable in a socially competitive learning environment. It also accommodates those learners who prefer to learn as part of a group and who might, therefore, benefit from face-to-face contact with their peers and tutors.

3.4 OBJECTIVES

According to Marland and Store(1982) the evidence for and against the use of objectives in distance learning materials is equivocal. They do, however, claim that there is slight positive evidence to support the use of objectives as a means of improving student learning.

Stoane(1985) considered the benefits of objectives from the viewpoint of the learners and that of the writer; she claims that objectives create structure thereby giving learners a clear indication of the course requirements and the writer the opportunity to make her/his

intentions explicit. Gillham(1980) goes further with the notion that as a result of contemplating and subsequently designing the objectives, the writer is forced to consider the total learning context.

The inclusion of objectives provides learners with targets enabling learners to pace themselves through the learning process. These targets also serve as incentives (Stoane,1985) and encourage learners to assess and evaluate their progress (see, for example, Bano,1971; Harrison,1985; Stoane,1985). In providing a self-assessment basis for the learner, the course writer satisfies one of the main criteria of distance learning. Furthermore, as Gillham(1980) stresses;

"In the absence of face-to-face contact, objectives act as useful clarifiers when the student is confused,"
(p.12).

Marland and Store(1982) stress that objectives should be included in distance learning materials whenever the learning task is complex or difficult and whenever it is not defined clearly.

Despite the so-called benefits of using objectives in distance learning materials, there are arguments against their employment. For instance, they are considered to be unsuitable for distance learning materials that concentrate on educational goals rather than training objectives in so far as they encourage specific learning of pre-determined criteria at the expense of creative, open-ended problem-solving behaviour (Gillham,1980).

According to Holmberg(1985) the basic question concerns who is to decide the nature of the objectives. He warns that study objectives

designed "in an authoritarian way" can be "powerful instruments of indoctrination" (p.46) overriding the principle of student autonomy.

By defining objectives in operational terms, there is the possibility of learners attaining the goals of the objectives without understanding the knowledge and procedures on which the operation was based. Holmberg cites an example by Lewis(1974 p.16),

"Anyone who believes the $.3 \times .3$ makes $.9$ (instead of $.09$) and that $.2 \times .2$ makes $.4$ (instead of $.04$) will no doubt, on the basis of a false understanding, come to the conclusion that $.3 \times .5 = .15$ which happens to be correct" (1985 p.45).

Nevertheless, Holmberg(1985) concludes that once the "inherent deficiencies" (Macdonald-Ross,1973 p.47) of objectives have been understood, "there is a strong case for detailed objectives in distance education" (p.46).

There are different types of objectives; Gillham(1980) categorises learning objectives according to their scale, complexity and domain. The scale of objectives varies from broad aims (large) to specific objectives (small); these are described more commonly as general and specific objectives. General learning objectives are characterised by verbs such as to know, to understand and to appreciate. Specific learning objectives, however, are characterised by precise action verbs such as to state, to list and to select. According to Stoane(1985);

"Specific objectives are the precise behaviours by which learners can prove to themselves or to assessors their ability to achieve a general learning objective" (p.11).

The category of complexity (Gillham,1980) is determined by the level of thinking involved in the learning objective according to Bloom's classification (1956), thus shown in Fig 3.41. The achievement of the high level learning objectives is dependent on the mastery of the low level learning objectives.

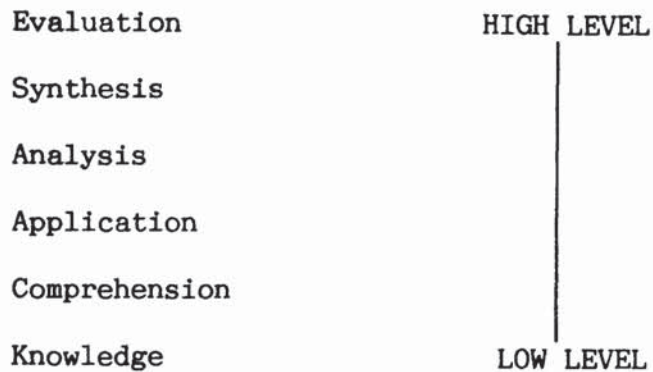


Fig 3.41 Taxonomy of Learning (Bloom,1956).

The category of domain is divided into psycho-motor, cognitive and affective according to the type of behaviour required in achieving the objectives. There is general agreement in the distance education literature that there are educational goals that are not measurable cognitive or manipulative skills (Holmberg,1985). Examples of these goals include encouraging customer or patient care and increasing student awareness of prejudice. The achievement of affective learning objectives is clearly more difficult to assess and is therefore perhaps less useful to the students as a measure of their progress. It is, however, sometimes advisable to include affective learning objectives whenever goals concerning attitude change or socialisation are concerned in order to alert the students to the nature of the learning (Holmberg,1985).

Indeed, it is important to accompany learning objectives with advice

on how the students can augment their learning process by employing the objectives to structure and assess their progress.

According to Mager(1975) the design of appropriate objectives concerns three indicators: performance, conditions and criterion. The consideration of these factors involve the writer answering the following questions:

1. What should the student be able to do at the end of the course?
2. Under what conditions should the student be able to perform the learning task?
3. How well must the task be performed?

For example, "The student will be able to select the technical definition of the term "velocity" (performance) from six alternatives (conditions) within three minutes (criterion)".

Harrison(1985) emphasises the importance of concentrating on the relevant points of the learning task when designing objectives for distance learning material; he claims that a common pitfall is attempting to be all-embracing. More precise advice is given by Stoane(1985), she proposes that objectives for distance learning materials should be: attainable; detailed; relevant; observable and measurable. They should also indicate standards and resources.

Irrespective of the design strategy it appears that objectives are not always used as the writer intended (Macdonald-Ross,1979). Marland and Store(1982) reported that many students used the objectives as a way of finding their way about the material. Moreover, they discovered that the position of the objectives in the text did not influence how they were used by the students. Nevertheless, they did find that specific objectives placed at the

beginning of the test enhanced relevant learning but decreased incidental learning by directing the learner's attention to the salient information. Objectives placed at the beginning of the distance learning materials have the potential to serve as "advance organisers" that enable the writer to;

"...bridge the gap between what the learner already knows and what he needs to know before he can successfully learn the task at hand" (Ausubel,1968 p.148).

Other researchers indicate that the position of extensive objectives on the first page of the unit "could be somewhat daunting to some learners" (Stoane,1985 p.15). Stoane(1985) goes on to recommend that the writer includes both general and specific objectives but that the former appear at the beginning of the text with reference to the position of the latter throughout the material. The integrated positioning of objectives is, therefore, encouraged.

Evidently, learning objectives have a role to play in the design of distance learning materials. The aim of distance education is to provide an effective and enjoyable means of learning which also encourages student independence and autonomy. Self-assessment is one way in which this is achieved; objectives provide an opportunity for students to assess themselves and to structure their learning process. Objectives also serve to encourage the writer to clarify and consequently reduce the content of the course into precise goals. However, it is important not to overlook the potential shortcomings of including objectives, such as overwhelming learners. The position of objectives is vital and in-text objectives are recommended. Wherever they are placed, objectives must be clear, precise and relevant.

Finally, there is scope in distance education for learners to achieve increased autonomy by involving them in the design, positioning and function of the objectives in their learning materials.

3.5 ASSESSMENT

Assessment procedures form an integral part of a distance learning course. They can vary in format from low-level multiple-choice questions, inviting students to recall facts, to detailed assignments involving high-level analytical skills, for example. Before examining the different types of assessment, it is important to establish the role of assessment procedures in distance learning. One function of assessment is the provision of the opportunity for learners to establish their own strengths and weaknesses through self-testing;

"Thus, the most distinctive feature of self-study text is the self-assessment question", (Lewis,1981 p.19).

Another function is the provision of informal assessment in the form of feedback and to prepare the students for formal assessment through tutor-marked assignments and tutor comments (Lewis,1980). In addition, learning is maximised as learners are forced to consider questions and generate answers as they work through text. According to Holmberg(1985),

"...the consideration and solution of such exercises followed by a scrutiny with the help of pre-produced model solutions with explanatory comments indisputably support cognitive learning" (p.96).

The function of feedback and dialogue is an important one for distance learners. The nature of the feedback varies from the stimulus-response common in multi-choice questions to discussion, analysis and problem-solving tested in assignments.

It is interesting that Kulhavy(1977) emphasises the role of feedback to incorrect responses as probably "the greatest positive effect" of the assessment process. He reports that the value of feedback can be endangered by too high a degree of difficulty and by having the answers too easily accessible by the students.

It is significant for distance learning that learners remember correct answers even if the feedback is delayed a day (Kulhavy,1977). However, as Holmberg(1985) states, this conclusion applies only to the retention of factual learning by reinforcement. Moreover, it concerns quite short delays of a day or two and most distance learners relying on written feedback wait at least a fortnight; the OU allows seventeen days for tutor-marked assignments (Thorpe,1987).

The level of learning aimed at is determined by the nature of the assessment methods. For example, self-assessment devices are generally associated with low-level recognition skills, although this is not always the case. Conversely, assignments are associated with high-level analytical skills. It is often recommended that the level of assessment increases with the complexity of the subject, the duration of the course and therefore the confidence of the student.

The feedback element constitutes part of the tutor-student dialogue; simulated conversation takes place through the personal style of the materials, the assessment devices and the exercises which demand a degree of active involvement on behalf of students in the learning process. The relationship stemming from student-tutor assignment contact can encourage and reinforce independent and creative attitudes in learners through individual feedback. Thorpe(1987) emphasises the additional benefits of assignments over self-assessment in general;

"...it is probably the single most important mechanism for prompting and pacing the individual's study and offers the only vehicle available to the student for feedback and dialogue with a tutor about their individual progress", (p.228).

Tutor-assessed assignments, therefore, serve the additional purpose of encouraging students to converse with their tutor; the self-assessment questions and exercises serve the same function to a lesser degree. According to Thorpe(1987) the rapport between tutor and student comprises a medium through which students can make known their understanding and response to the course. She attributes the quality of the relationship to the attitudes concerning learning and the practical commitment of the course team. In order to monitor this, the OU, for example, uses a statistical analysis of grades awarded by tutors (Murrell,1976) and sample students commenting on the quality of teaching comments from a batch of tutor scripts.

Bååth(1980), however, from his investigation into the differences between various assessment methods, concludes that it was possible;

"...without any noticeable effect - neither negative nor positive - to replace substantial numbers of assignment questions by self-checking exercises with model answers and pre-produced comments within the teaching material" (p.152).

3.51 Types of assessment devices

The choice of assessment appears to depend on the nature of the content and moreover on the objectives of the course. (Appendix III shows the attributes of different media from the point of view of distance learning). The inclusion of in-text questions which require the recognition and recall of facts might lead to surface learning (Marton,1979) but in some cases the retention of facts is essential;

Holmberg(1985) cites the example of the student of a foreign language. Learning a language cannot be achieved without a number of repetitive and low-level recall questions and exercises.

Questions that require students to mark their answers in the correct place are often referred to as 'objective tests'. Sometimes students are provided with detailed questions in order to check that they are retaining the relevant facts. According to Holmberg(1985) this technique encourages students to re-read sections of the text if they are in any doubt about the correct answer.

Multiple-choice questions require the student to identify the correct answer from a menu of answers. One criterion of multiple-choice questions is that they can only be designed to test low taxonomical levels of learning. Many of the so-called drawbacks of multiple-choice questions are due to the inadequacies of the design. Nevertheless, multiple-choice questions are easy to correct and assess. They demand less time and less irrelevant writing than some open-ended questions. Unfortunately, however, there is scope for guesswork and as a result learners might be conditioned into remembering the incorrect answers. There is also no case for middle-ground answers; answers are either correct or incorrect. There is no opportunity for learners to indicate the method adopted in arriving at their answers. The tutor is not, therefore, in a position to point out student misunderstandings until a question or exercise demanding a more detailed answer is tackled.

Another type of objective test used in distance education is the re-arrangement test; students number items in a menu consisting of a

series of events or a process, for example, in logical order to demonstrate the correct order between items (Holmberg,1985). Students must fill-in the gaps in sentences or tables in order to be assessed on completion tests. Completion tests do, therefore, require some generation of knowledge although re-arrangements test provide all the necessary information.

Although, objective tests are useful for checking factual knowledge, application and understanding, it is important that the writer does not waste the time of students nor tutors by including tests that demand an amount of work which exceeds their educational value. In addition, they do not encourage students to record knowledge, verbally or in writing; students are often required to rely on recognition alone.

It is essential in order to develop skills and knowledge meaningfully to provide the student with the opportunity to practise; it is one thing to follow a theoretical discussion leading onto the correct conclusions but it is another to produce solutions to similar problems independently (Holmberg,1985). The frequency and intensity of the practice depends to a large extent on the subject and the learning characteristics of students. Self-assessment questions and exercises must, therefore, in certain cases therefore demand high taxonomical level skills from students. According to Marland and Store(1982);

"...a useful rule of thumb for writers would be to insert a high level question or two after each section of text material dealing with an important theme, topic, issue, theory or similar substantive unit," (p.94).

Lewis(1980) advocates that the motivation of students is sustained if the questions are perceived as varied, relevant and interesting. In order to achieve this, it is important to consider the level of challenge of individual questions and exercises, the type and frequency of questions and the type of answer required. Examples of different types of questions demanding more than recognition skills include: anticipatory questions that invite students to develop the next stage of the argument for themselves; questions that require students to summarise the preceding argument; textual analysis which invite students to judge the validity of an argument; and application exercises and problems that request students to apply the preceding knowledge and to practise skills (Harrison,1985).

Other types of assessment and activities are more complex and time-consuming for students. These include essay and report writing, the production of drawings, paintings and artefacts and the conducting of investigations, experiments and surveys. A range of skills can be tested by assigning students a project which is submitted in stages so that its development can be monitored.

"...project work not only allows for the building up of subject matter knowledge, but also the exercise and development of enquiry and communication skills and some degree of independence and self-direction in learning," (Morgan,1987 pp.246-247).

According to Holmberg(1985) assignments for submission and other high-level assessment tests are largely prognostic, although they might have some diagnostic functions. Other assessment devices, such as pre-tests, are however essentially diagnostic. Pre-tests accompanied with special instruction sheets have proved very effective at Hermods (Holmberg,1985). If the tests reveal

inadequacies in a student's knowledge or skill repertoire; s/he is immediately referred to the instruction sheet which tackles the identified difficulty. Diagnostic tests of this kind can be self-checking and are therefore useful to distance learners who can refer back to them to check on the progress made. Hartley(1972) found pre-tests to aid subsequent learning. They serve to orient the learner to the content but should be used in conjunction with other instructional devices (Marland and Store,1982). It is important to inform students on how to use the pre-test in order for it to assist the learning process.

It is worthwhile examining how assessment devices are used by students; according to Van As(1983) inserted questions are not rated highly by students even though more than 60% of students were found to answer them in some way. However, Nathenson(1978) reports that only a minority of learners actually write down the answer; the majority just thought about them or read them as part of the text.

"...although the self-assessment questions were ranked at much the same level of importance for organising study, as the learning objective and the assessment items they are among the items most readily omitted by students when pressed for time" (Kaye,1972).

Often the position of assessment devices in the course assumes that learners start at the beginning and work through the material systematically to the end. This structure is cited by students as a disruption on their chosen approach to the content and the learning process (Marland and Store,1982). Unless the self-assessment devices are perceived by students as "tapping the essentials in the unit" (Duchastel and Whitehead,1980) they often run the risk of being disregarded as invaluable (Nathenson,1978). It is suggested that

post-text questions are preferable to in-text questions as far as revision and review purposes are concerned.

Bååth and Månsson(1977) claim that students prefer open-ended questions or objective tests such as multiple-choice questions. Bååth(1976) from his survey into the importance of assignments for submission from the point of view of students reports that "To give students effective feedback - help them to correct their mistakes and control their progress" was ranked the highest (91 points out of 465) and "To motivate the students, owing to the fact that the assignments for submission serve as sub-goals" was considered to be the second highest function for the students (58 points out of 465).

It is common for students to be overloaded by assignments (Blackwood,1976). This was held by Thorpe(1987) to be due to the discrepancy by the course team between estimating the time require by learners and the actual time they took to complete assignments; project work was found to take as much as five times longer than anticipated. The situation is compounded further if the assignment is required at the end of the course which tends to coincide with examination schedules.

3.52 Design Recommendations

It is evident that unless students perceive assessment devices as relevant they will perform some of them and not necessarily in the way in which they were intended. Initially, it is important to make students aware of the benefits of assessment devices and their relationship to the objectives (Nathenson,1978). Each objective should be tested by a question (Lewis,1980;1981). An explanation of assessment format and the characteristics of appropriate answers

should be included in the introduction to the course, particularly if students are unfamiliar with distance learning (Lewis,1980).

The position of assessment devices relative to the text has been investigated; Marland and Store(1982) postulate that assessment questions placed before the text lead to specific learning whilst those placed after the text encourage generalised learning only, however, in the case of low-level questions; those demanding high-level responses revealed no consistency in positioning.

Lewis(1980) examined the consequences of including assignments: in the body of the text; all together in a supplement distributed at the same time as the distance learning text; and issued separately from the text. Positioning assignments in-text is beneficial in that they occur immediately after the information has been discussed. This method is, however, difficult and expensive to alter and update. The two other methods investigated are not affected by this problem but they do not take into account earlier feedback and might prove daunting to students. In addition, the amount of administration is increased and an individual relationship with the student is not established.

The positioning of self-assessment devices in distance learning materials is usually in-text although "...there is no law for deciding frequency: some materials call for a response every few minutes, others every few hours" (Marland and Store,1982 p.94). It is evident that all assessment devices should be identified clearly, for example, with symbols like a clockface indicating the anticipated time needed to complete the question. Other types of signposting include the use of different typefaces, boundary lines (Wilson,1987)

and indented spacing. According to Lewis (1980) it is important to vary the format of assessment devices in order to maintain interest and therefore motivation. Wilson(1987) claims that this can be achieved by designing the questions in such a way as to impel the learner to participate. He includes the following examples (p.98): "Now see how many of these you can get right" and "You'll need to answer the next question carefully before you can proceed".

Therefore, questions must be compatible with the skill, knowledge and motivational levels of the target population. It is essential to avoid introducing new information and unnecessary difficulties. For example, students of electronics learning about fault diagnosis should not be required to submit lengthy written assessment on the history of electricity unless written skills of this nature are an integral part of the course objectives.

Although being able to answer questions correctly builds the confidence of the student, it is vital to maintain a degree of challenge in order to encourage involvement in the learning process (Holmberg,1985). Lewis(1980) emphasises the tone of the question; he proposes that an informal, friendly, guiding and pragmatic conversational tone should be adopted. An indication of the average time necessary to complete a particular assignment is advisable to enable learners to pace themselves and to compile a study schedule.

The answer to the assessment question and exercise is as important as the question since the distance learners rely heavily on the feedback from the text. The position of the answer, for example, is important; Harrison(1985) recommends the use of "student-stoppers" in order to prevent students who wish to answer the question from unintentionally

reading the answer. He suggests the use of a visual barrier, such as a line of asterisks, between the question and the answer. The use of the selected device must be consistent and learners must be informed about its purpose. If, however, the answer is a single word or a diagram, for example, it might be recognised easily at the fringe of vision; in these instances Harrison(1985) suggests that the answer is placed at the foot of the page or overleaf; "The general principle is that the answers should be readily available but not obtrusive" (p. 39).

Stoane and Stoane(1981) investigated the position of the answer on students' learning performance and the convenience of the writer. The provision of answers in frames covered by a mask, for example, was found to be tedious, cumbersome and non-motivating. Tucker(1980) proposes that answers should be placed in random order at the back of the written material; Stoane and Stoane(1981) consider this method to be neat, inexpensive and efficient in so far as learners cannot see the following answer. Learners, however, were reported to have found it irritating. In conclusion, it appears that the risk of providing the answer inadvertently must be taken for the sake of ease of organisation, low production costs and above all the convenience of learners. Although the principles of writing good assessment questions and answers are therefore similar, one characteristic of good answers which must be stressed is that of detail. The method of arriving at the correct answer must also be included and alternatives discussed (Lewis,1980). This is important particularly in instances where the answer is not self-evident; Holmberg(1985) suggests that audio-tapes can be used to supplement the tutor-marked assignments. For example, the Arts Foundation Course at the OU employs audio-cassettes to talk students through the stages in answering

assignments before they embark on one; students were reported to need help in interpreting what was expected of them in terms of the assessment procedures. Holmberg(1985) claims that model answers and complete solutions require reinforcing with comments explaining, with reference to the course, why the solution proposed by the student was incorrect.

Thorpe(1987) examined how computer feedback can contribute to effective learning and reinforce student motivation by providing the opportunity for another form of assessment. Students are reported not to be deterred by computer assessment and in some instances it is preferred because the response is quick, courteous and legible (Bååth and Månsson,1977). Computer feedback does, however, considerably increase the workload of the course team (Thorpe,1987).

4.1 INTRODUCTION

Initially, it is important to stress that there is no one medium that is more effective in distance education. Moreover, media decisions must be made for both the subject content in the form of pre-produced courses and for the element of two-way communication. The choice of media also depends on the characteristics of the learner; for example, a person who suffers from poor visual acuity might benefit from the use of audio-cassettes to supplement print-based material.

The requirements of the course play a part in determining the type of media employed in the package. If one of the objectives of a course is concerned with the demonstration, physical or written, of a procedure, such as fault-finding on electronic equipment, the use of interactive video or practical kits might result in an improvement in performance. Similarly, pronunciation as an integral element of acquiring a foreign language cannot be learned efficiently from non-audio material alone (Beard, Bligh and Harding, 1978).

There are several other constraints to consider when selecting media for use in distance education. These include the economics of employing a particular medium which depends on peripheral equipment; for example, the use of an audio-cassette requires a cassette player and the use of interactive video requires a monitor, disc drive and an interface. The size of the target population determines the economic feasibility of employing high-tech media, as does the datability of the subject content. A small number of learners using interactive video-disc is likely to be an expensive means of training. It would be advisable to examine alternative means of

instruction or a way of increasing student numbers. There are also physical constraints to bear in mind, such as the mobility of media and the peripheral equipment and the geographical location of the target population. The social constraints might include domestic concerns such as permitting equipment, which might be expensive or particularly difficult to assemble, to be removed from the workplace and reassembled in learners' homes.

Handal(1973), as well as proposing his own model, summarises the attempts of Bretz, Tosti and Ball, Briggs, Campeau, Gagné and May to develop a taxonomy of media choice for each individual part of a course of study according to specific functions and applications of different types of media (Holmberg,1985 p.67).

Holmberg(1985) emphasises the necessity to bear in mind the attributes of the medium rather than the medium itself:

"The attributes of a medium, then, are the capabilities of that medium to show objects in motion, objects in colour, objects in three-dimension, to provide printed words, spoken words, simultaneous visual and auditory stimuli" (Levie and Dickie,1973).

The attributes of media types for teaching situations in general have been presented in table form by Gagné(1967) in relation to their didactic functions: Duane(1974) who concentrated on the cost and commercial availability of media; and Svensson(1973) who considered pedagogical, technical and economic aspects. Other attempts to summarise the attributes of different media available to distance education include Jenkins(1980), Harrison(1985) and Wilson,1987). Holmberg(1985) advises listing first, the media available for the course in question and second, the criteria for selecting the media.

This second list includes considerations such as the time available, the attitudes of the students, the cost and the opportunity of profitable co-ordination with practical work. The relative importance of each of these is awarded in the form of a number. The requirements of criteria awarded the highest figures of the course can be matched with the available media for each unit and each group of objectives. Although he suggests that this method of media selection does not prevent bias from influencing the outcome since "pre-determined conclusions can be rationalised by idiosyncratic scoring systems" (Lehmann,1968), Holmberg(1985) believes it offers practical guidelines providing it is used "with judgement and discretion" (p.69).

One theoretical determinant of media choice in the form of taxonomies is that of "media-individual-difference-behaviours" (Clark,1975 p.135). Clark suggests that various "interrelated schemes" (p.210) are considered, namely trait systems (Guilford's (1967) structure of intellect model, for example), cognitive (covert) behaviours and/or affective (overt) process descriptions, typical or atypical learning outcomes, according to Bloom's taxonomy (1956), and the media attributes from previous media research. According to Holmberg(1985):

" In distance education the selection possibilities are often extremely limited. The printed and written word on the one hand and audio-recordings on the other sometimes exhaust the selection opportunities", (p.68).

However, Laurillard(1987) proposes that in order to achieve the essential training and retraining of the workforce to an acceptable level "...new technology must play a part in modernising the training industry, as it does for every other industry" (p.47).

A similar view is advocated by Kaye(1987);

"In the design of any distance education project now, in the late 1980s, attention should be paid to the ways in which developments in information and communication technologies could produce flexible systems with more scope for two-way communication, for updating of course materials, and for "customising" of courses, than in the more traditional distance and correspondence educational institutions," (p.187).

In order to illustrate the factors influencing their choice and operation, it is necessary to examine some of the common types of media in more detail.

4.2 COURSE CONTENT

4.21 Print

Print is widely accepted as the basis of the majority of distance learning courses;

"By far the most important medium in distance education courses is the printed word. This applies to conventional correspondence study, as well as highly sophisticated multi-media presentations like the courses of the Open University" (Holmberg,1985 p.62).

Indeed, there appears to be few courses designed without print-based material since even high-tech choices, such as interactive video and computer-based distance learning, are usually supplemented with details of operational instructions, for example, in the written form. This highlights one of the major advantages of print; it provides a permanent record of information and can therefore be consulted whenever and for whatever purpose the learner wishes.

Print-based materials are also well-suited to distance education because they are relatively mobile and can be added to, both by learners in the form of study notes and by tutors in the form of

study skill guides. Therefore, print as a medium of distance education allows for the individualisation of information, functions in a wide range of study environments and is accessible for revision (Wurster,1979). The relative cheapness with which print-based material can be produced, distributed and revised renders it an attractive choice for the organisation providing any education or training.

It does, however, have its disadvantages; for example, the recipient learners must be of a predetermined level of literacy and familiar with a particular culture. Moreover, it is assumed that the learners will not only be able to see the print clearly but also be physically able to turn the pages. As an instructional medium, print has limitations according to the kind of learning involved, for example, in the cognitive domain, print-based, self-contained distance learning courses are successful in achieving the acquisition of intellectual knowledge. Chang, Crombab, Van der Drift and Moonen(1983) distinguish between skills and knowledge which can be learned through distance education: skills are sub-divided into operations on knowledge and operations with knowledge. The former is concerned with;

"...coded knowledge and results in new or new representations of knowledge, and in the skill of producing new forms of knowledge out of existing knowledge" (p.14).

This division is within reach of print-based courses, whereas operations with knowledge are concerned with results in the exterior world and are, consequently, achieved less easily using print alone.

Some motor objectives, such as surgery or the ability to handle

dangerous equipment, cannot be learned without visual application and practice. Similarly, in the affective domain print-based material is arguably in need of supplementation from face-to-face interaction in order to ensure that, for example, the desired attitudinal change has occurred. It is important to note that as Holmberg(1985) points out, it is the use made of the medium rather than the medium itself which is decisive for learning efficiency in distance education.

4.22 Audio-tapes

One medium that is available for different use is the audio-tape. Gore and Rayner(1972) investigated the employment of audio-tapes in the instruction of students on the operation of electronic equipment. The addition of slides and then booklets was examined by Brewer(1977). A great deal of research has taken place into learning foreign languages using audio-tapes (see, for example, Beard, Bligh and Harding,1978). The results of these studies and of a series of interviews and case studies conducted at the OU suggest that audio-tapes are easy to work with in so far as it has low level technological demands and avoids unnecessary intrusion upon students' learning processes (Durbridge,1987). The audio-tape is described also as a convenient medium since it can be used to a certain extent when and where students choose and at their own pace. This high degree of user control is stressed by Kelly and Ryan(1983).

The advantages of the audio-tape stem essentially from the employment of the human voice as the deliverer of the information. The intimacy of the human voice links the tutor and the student in a bond of learning. This 'conversation' provides a stimulating and motivating force particularly in instances where no other contact with tutor or other learners is possible; McDonald and Knights(1979) claim that 80%

of their learner population found the use of audio-tapes to counteract both isolation and declining morale.

Audio-tapes are comparatively inexpensive to produce and the cost of mass-production from a master tape is small; the audio-tape is a useful medium to employ if learner numbers vary (Lewis and Meed,1986). Moreover, most people have access to cassette players either at home, at work or in libraries. Engel(1976) reports how students prefer to use the audio-cassettes in their homes rather than in educational institutions. These factors contribute to the significant compatibility of audio-cassettes with distance education.

One disadvantage of this medium, however, is that it requires facilitation and enhancement from a series of visual sources which both media use as a common reference. This can take, for example, the form of maps, photographs, key words, as well as written study notes. The OU employs these audio-visual techniques successfully as part of mathematics courses; they adopt a visual presentation (hand drawn concrete images) which complements the informal and personal style of the audio-cassette (Durbridge,1987). Another disadvantage of audio-tapes is that they are not interactive; they do not provide immediate feedback to queries nor do they tackle issues specific to individuals since they are usually made for a group of learners.

Usually audio-tapes are designed for use by individual students, Teather(1976), however, investigated their use by groups of distance learners away from the educational institute. The tapes consisted of a short text highlighting a particular issue and subsequent open-ended questions that encouraged group discussion. The resulting interaction is recorded on the cassette as a permanent record.

Therefore, audio material provided it is presented in an interesting manner is a stimulating vehicle for emphasising important ideas and concepts. This is relevant particularly at the beginning and the end of the courses when it serves to point learners to the pertinent issues and to encourage analytical and self-assessment techniques.

As far as deciding when to employ audio-tapes, it is a question of examining the objectives of the learning task. For example, the fact that learners have their hands free for much of the learning period is important if a basic manual skill is involved. The start/stop facility enables the instruction to be broken down into manageable chunks, this might be beneficial when learning problem-solving skills. Similarly, audio-tapes can be used to help learners develop or practise skills such as verbal, visual or aural analysis (Durbridge,1987). In-text questions and exercises followed by instructions to turn off the tape and to refer to accompanying notes in order to formulate an answer encourage learners to participate in "a co-operative enterprise" (Durbridge,1987 p.176). The correct answer and how it is reached are provided on the tape for feedback and revision purposes.

According to Harrison(1985) the preparation of audio-tapes need not involve elaborate facilities; the basic recording equipment, including a microphone and a reel-to-reel tape recorder, and a quiet place to record are adequate for speech recording. He proceeds with the warning;

"Without necessarily sacrificing spontaneity, you should expect to spend about as much time preparing a cassette as you would preparing a written text of the same length" (p.45).

It is important therefore to prepare a script before beginning to record. Moreover, if audio-visual material is being designed, both items must be finalised together before recording. Sound and vision must guide the learner through the material in the appropriate sequence and with the minimum of effort. It is also helpful to prepare the cassette as though conducting a one-to-one tutorial. It is important to avoid conceding the enthusiasm and personality of the tutor for the sake of professionalism by employing a speaker who might not have an understanding of the subject matter nor students' learning requirements.

When students are required to answer a question or perform an activity, a short burst of music or a musical tone can be inserted to act as a signal to switch off the tape. This serves as a "student-stopper" for separating answers from questions and provides an access device for revision purposes (Harrison,1985). Durbridge(1987) recommends;

"As a general rule, questions that are heard should be replicated precisely in writing" (p.178).

This can also be achieved by signposting using typographical cues, for example. A clear indication in the accompanying text or notes of where students are advised to refer to the cassette, and vice versa, is therefore recommended. It is crucial to make students aware of what they are expected to gain from the material; Harrison(1985) states "this should appear in the main text or students may not bother to switch on" (p.83). The instructions regarding how the learner should approach the learning task and references to any additional material are located in the printed material along with the self-assessment questions and answers and a summary of the main points.

The cassette should be tested on colleagues and potential students to ensure audibility and that the pace of presentation is aimed at the appropriate level of understanding. It is often simpler to re-record rather than editing audio-cassettes.

4.23 Video

A growing availability of video cassette recorders (VCRS) and cameras renders the inclusion of a video component in the distance learning system a viable possibility. It is important, however, to justify the extra cost in an improvement in performance and learner satisfaction; it might be just as efficient to use audio-visual material in the form of audio-tapes and written units. Nevertheless, there are certain teaching functions that are perhaps better fulfilled by the video than by other media.

The most obvious and valuable use of video is to show motion, change or process (Harrison, 1980); it serves to demonstrate procedures in providing, for example, a record of how to solve mathematical problems or problem solving activities. (These benefits are shared by the use of television as a medium for distance education). The technology involved in the video enables the producer to emphasise selected elements of the picture, to freeze shots and to reveal development with time-lapse photography. The learning experience of the student can be widened by an exposure to real-life situations or details of a previously inaccessible item. Students can observe human and animal behaviour in its natural environment. In this way, students become involved in the subject which is significant, particularly in instances where simulation is included to illustrate complex phenomena.

The video permits information to be used repeatedly. It is sometimes available "off-the-shelf", although using any material that has been designed for other learners will not be designed according to the objectives and characteristics of the actual target population; it is advisable to consider producing tailor-made distance learning courses. Evidently, the cost of video production involves relatively expensive equipment as well as the skills necessary to produce an efficient learning tool. However, a reasonable result can be achieved with a hand-held camera, a stand, one or two microphones and a domestic video-recorder with a television. As Harrison(1980) points out "effective work can be achieved using simple equipment with no more than a blackboard and chalk." (p.48). Indeed, it is vital not to be too ambitious unless there is financial and professional support to justify it. Moss(1983) discusses the principles involved in making videos, including visual and audio quality. He stresses that students must be able to have time to follow and digest the presentation and the activities involved. There must also be adequate explanation regarding how student should tackle the learning task and whether additional learning aids, such as study notes, might be useful.

Since the introduction of the interactive video the benefits of the video in distance education have increased dramatically. The use of interactive video is widespread in areas where skill acquisition is the objective. Certain types of skill are best suited to this medium, namely interactive skills, problem-solving skills and some motor skills. There is now scope for learners to engage in two-way conversation with the tutor through the interface of the interactive video. Learners can study at their own pace at a monitor in an environment which might be designed specifically to suit their own learning needs; some businesses have special rooms within the

training centre where interactive video users can study alone. (This, however, is not necessarily compatible with the demands of distance learning which promotes the autonomy of the individual from the constraints of the tutor, peers and the working environment.)

With distance education learners are often deprived of feedback, or at least prompt feedback. The interactive video goes a considerable way in providing a solution to the problem of feedback. Learners gain feedback as they work through the video programme; correct answers are rewarded with praise whilst incorrect answers are met with explanations and opportunities to "try again". By the time the programme is completed, learners have enforced their learning through the questions, exercises and activities included in the interactive material. This medium is sometimes supplemented with written material so that learners have a permanent record of the learning task and their progress.

This illustrates one disadvantage of video, and the interactive video, as a vehicle for distance learning, namely that the audio-visual material needs support from print-based material. Moreover, the nature of the equipment involved renders the accessibility of the interactive video to students whenever and wherever they choose virtually impossible; the provision of the monitor, disc drive and interactive device is relatively expensive and impractical. The cost and operation factor, therefore, forces this kind of medium to be installed in a particular location for use by a certain group of students at a predetermined time. This arrangement threatens the independence and autonomy of the individual learner which is paramount in distance education.

Updating programmes on the interactive video is also expensive compared to the cost of revising, for example, print-based material. It would appear that as a choice of medium for distance education the video and the interactive video are recommended in instances where there is financial and professional support and where the learning task demands the use of a visual demonstration of the necessary skills and the opportunity for interacting in such a way as to provide learners with practice in developing skills. It is worthwhile considering the advice of Wilson (1987) when deciding on the choice of media, "...restrict yourself deliberately to using the simplest form of media which will satisfy that need," (p.112).

4.24 Computers

Computer-based learning (CBL) is the term adopted to encompass the role of computers in education. The learning processes of learners benefit from the self-pacing and reinforcement opportunities of this system; feedback, for example, can be gained immediately from the computer software. In addition, the facility for links to mainline computers based in the educational institution can overcome feelings of isolation and loneliness without jeopardising learner autonomy since contact with the tutor/institution is learner-initiated. An increasing number of computers are installed in homes, offices and educational/training establishments making this form of medium increasingly accessible to learners.

It is, however, still a relatively expensive medium despite the greatest percentage of the overall cost being concerned with the initial outlay of installation. Furthermore, it requires additional skills from both the learner and the tutor regarding the design, use and revision of software. It also demands, other factors such as

institutional integration because of its prerequisite demands of a massive amount of rethinking, additional skills, planning and investment.

The pedagogical fit must be established (Laurillard,1987) and personnel awareness increased:

"A complex innovation of this sort is inevitably vulnerable to opposition from any one of many staff groups or individuals" (p.50).

It is not just a question of adopting new technology for the sake of technology but for the sake of learners' requirements and the demands of the learning task. There are certain forms of media that are often overlooked in pursuit of high tech options.

4.25 Television

There is evidence to suggest that subject knowledge can be learned as well through television as through print; Schramm(1974) provides a summary of the research in this field. Television excels at helping students in complex or ambiguous situations and encouraging them to interpret and apply what they have learned (see, for example, Bates,1983;1984; Salomon,1979). Nevertheless, according to Bates(1987);

"Perhaps of all the media available for open learning, television is the least understood and most neglected by designers and tutors of open learning" (p.163).

He distinguishes between the different kinds of television broadcast open to distance learning according to the three main parameters, namely: 1, type of production; 2, method of distribution; 3, method of utilisation. For example, types of production vary depending

primarily on whether the broadcast is used to distribute illustrated lectures or to take advantage of "the unique visual characteristics of television" (Bates,1987 p.164). The former involves making material accessible to large numbers of students in their own homes at minimal, if any, extra cost to the student. The latter involves television revealing material which would otherwise be inaccessible to many students, such as case-studies, laboratory experiments and field visits (Bates,1984). It also involves the ability of television to contribute to the learning process through the provision of concrete examples or models of abstract principles. This cannot be achieved easily in print-based material, although audio-visual and to a greater extent video material is successful in this area. The methods of distribution include the most common form "terrestrial broadcasting" which employs a ground transmitter, satellite transmission and cassettes. The use of television is similar to that of standard video, although it is sometimes more limited in that it adopts the format of "the uninterrupted programme, seen straight through, once only," (Bates,1987).

However, students do not necessarily know how to learn from television, this is true particularly when comprehension is not the main objective (Bates and Gallagher,1987). Moreover, television can be a very passive medium and learners have a tendency to treat it in the same way as a lecture. It is important therefore to build in activities in order to encourage learners to interact with the material. One way of achieving this is through group discussion following a broadcast, although this introduces a further element of pacing as well as the competitive face-to-face situation which might threaten the autonomy of some learners (Holmberg,1986). In order to employ television as a medium of distance education, it is essential

to clarify the need for this channel of instruction. If it is a distribution need, for example, perhaps a combination of print and audio-visual material could be produced and implemented less expensively.

4.26 Other media

Radio programmes, like television programmes, serve to reduce isolation through a sense of personal contact and therefore help to sustain the motivation of the distance learner. The use of radio broadcasts has been found to be particularly useful in areas of primitive communication networks and sparse population. They can provide a degree of feedback by allowing students to participate in programmes through discussion with their tutors. Nevertheless, this type of feedback is delayed and consequently of limited benefit to distance learners.

The use of film strips and slides to supplement audio material is discussed in the literature. They are compact, easy to operate and revise (Wilson,1987) and provide a colourful and interesting means of viewing additional information (Jenkins,1980). Unfortunately, their production is costly in terms of their educational value and they require special equipment. In short, they are not conducive to individual distance study unless part of an expensive, multi-media presentation.

4.3 TWO-WAY COMMUNICATION

In distance education media decisions must be made regarding the provision of the characteristic two-way communication. Print-based material has a limited capacity for the exchange of ideas and problems since replies must be sent through the post and that can be

a lengthy process; it takes distance learning communication approximately two weeks to be sent to the tutor and returned to the student by post (see, for example, Graff, Saxe and Ostlyngen, 1966; and Haagman, 1970). Clearly, this problem is exacerbated in areas of vast geographical expanses and in areas with poor communication facilities. The telephone is one way of supplementing print-based interaction thus providing immediate contact between tutor and student or between fellow students. Ryan (1987) investigated the use of the audio-tape to support distance learners. The tapes are produced at intervals by the tutor and distributed to particular learners during the course. Tutors may record their comments while assessing individual learners' work, this gives more detail than just the written comments and aids motivation.

The most popular use of 'tutor-tapes' is for advice and comments relating to the assignments and to a lesser extent concerning examinations. It is important that no additional course material is provided by the tutor-tapes; their function is purely supportive. The recommended duration of such a tape is approximately thirty minutes. It might include, for example, discussions of common problems brought to light by the last assignment.

According to Taylor (1987) guidance is an important aspect of student-tutor interaction. He claims that guidance can be regarded as comprising of: information; advice; and counselling. (Other researchers might add evaluation or feedback as a fourth component.)

"Information records the facts of what has been, is, and is expected to be. Advice begins to relate these facts to what the enquirers or recipients believe to be their circumstances, abilities and aspirations, so that some rational choices are clarified. Counselling goes further to ensure, as far as possible, that those

seeking guidance are asking the right questions in the first place, and then fully understand the relevant information and consequent choices open to them" (Taylor,1987 p.209).

Audio-cassettes are limited by the postal system in much the same way as written communication. Moreover, the preparation of a cassette is not always as convenient as writing a letter. It is worthwhile pointing out that to some audiences audio contact is preferable, for the blind or illiterate, for example.

It would seem that this is an area of distance education where technology can play a significant role; computer-mediated communication is an area of potential expansion and improvement. Kaye(1987) mentions four features that he considers to contribute to its compatibility with distance education. First, he proposes that once the equipment, software and network facilities are installed, costs can be very low. Even in cases where the institution's own computer network cannot be accessed, charges would be less than for long-distance telephone calls. Second, Kaye states that communication is synchronous unlike face-to-face meetings, telephone calls or conferences because messages can be entered and retrieved at a time which is convenient for learners. Third, all communication can be stored automatically for future reference and fourth, the organisation and structure of the communication can be adapted to provide additional conversation features such as directories of users' names and note pads for private use. However, there are issues which serve to question the development of computer-mediated communication in the field of distance education. The scale implied by some distance learning courses, especially in business, is much greater than previously implied by the role of the computer conference in education.

Furthermore, the integration of this form of communication into complex systems calls for radical changes in existing practices of course development;

"The real changes will come when the infrastructure of the development of course materials changes,"
(Laurillard, 1987 p.53).

Kaye(1987) suggests that the potential of computer-mediated communication in distance education lies in the progress of group communication as a supplement to individual learning. He envisages learners exchanging ideas and experiences with each other and in so doing actively engaging in the learning process. The ability to share, organise and retrieve information whenever learners choose places them in a position of control over the learning process. However, Kaye warns that the likelihood of information overload is real in instances of high-technology systems.

Multi-media techniques can reap the benefits of enhanced presentation, increased motivation through stimulation and re-stimulation as a result of variety. Access to course materials can be improved if alternative modes are offered provided valuable information is contained in all modes, so that by not watching a particular broadcast, for example, learners are not at a disadvantage. Moreover, the repetition of salient information in different ways serves to reinforce learning. A compilation of media techniques can expose the learner to many aspects of a particular learning task, for instance, using print for the straightforward knowledge requirements, audio material for the oral skill requirements and computer-based learning for the problem-solving activities. The increase in teaching and learning effectiveness can

be such that the multi-media approach is also economically viable. However, it is important not to overload the learner with unnecessary media; meeting the needs of the learner in the simplest form is the main aim of designing distance learning courses.

4.4 CONCLUSION

In conclusion, criteria do exist for selecting media for distance learning courses. First, it is vital to establish the educational objectives of learners and their supporting organisation. Certain objectives can be achieved more efficiently through a particular medium, whilst others can only be reached in this way. In addition, the geographical, domestic, educational and professional characteristics of the learners must be considered in order to establish whether their environment, knowledge and skill levels are suitable for the course material and the media employed.

Second, the needs of the learners and the supporting organisation must be matched to the attributes of the available media. Clearly, financial considerations might exclude some forms of media at this stage. It is worthwhile bearing in mind that all forms of media have particular skill, equipment and integration requirements which might not be compatible with the resources available.

Third, it is a question of establishing whether there are the resources available to supply and support the media most suited to meeting the educational objectives. There might be a case for purchasing "off-the-shelf" materials rather than producing them in-house or employing an expert to develop them. However, adopting or adapting ready-made materials must be decided upon only after it is evident that they are going to meet the needs of all those concerned in the educational or training process.

Fourth, having reached a decision regarding the media approach to be selected, it is necessary to examine the choice in the light of short-term and long-term development plans. The components within the distance learning course must fit together and operate efficiently as a system. The planning stages should be verified ideally with pilot and developmental studies in order to ensure that the selected media approach is as simple and effective as possible. (Appendix IV shows the attributes of various media from the distance learning perspective).

5.1 INTRODUCTION

It is widely accepted that evaluation is a process whereby the weaknesses, strengths and consequently the needs of an entity are described and then assessed (Stake,1967). The relationship between data collection and decision-making is explicit in definitions of evaluation (see, for example, Cronbach,1963; Parlett and Hamilton,1972). MacDonald(1973) defines evaluation as "the process of conceiving, obtaining and communicating information for the guidance of educational decision-making"(p.1).

It is important that the evaluation of every programme or innovation is considered individually so that its characteristics and techniques can be given proper attention. With this in mind, Cronbach(1982) offers a functional theory of evaluation which questions the validity of transferring investigative forms between programmes. The OU proposes an eclectic strategy based on the suitability of the evaluation's intended purpose (internal validity) and its credibility (external validity). Johnson(1984) points out that in real-life situations, evaluation is neither designed to tackle particular problems nor eclectic; he claims evaluators structure their research according to their own ideas and experience.

Despite evaluation developing "a legitimacy and importance of its own" (Parlett and Hamilton,1972), it is apparent that there is a need for a theoretical framework within which the criteria for measurement can be selected and the results analysed. Much of the literature deals with evaluation techniques for a specific programme or else is

unable to offer practical guidelines (Barber, Adderley and Randall,1981). This is true especially of innovatory programmes, such as distance education, where the attitude of the learners and their relationship with the institution are major contributors to the evaluation process. The evaluation of distance education must therefore emphasise the results of the students' encounters with the learning experience, as well as the encounters of the tutors and supervisors.

5.2 DESIGNING EVALUATION

According to Rowntree(1982) the first stage of designing evaluation is "to resolve the purpose of the evaluation"(p.329). Scriven(1967) describes the purpose of evaluation as formative or summative depending upon when in the educational programme the evaluation takes place; formative evaluation occurs almost as an automatic process during the design and development procedures, whereas summative evaluation commences once the learners have been presented with their learning materials. The role of formative evaluation is to discover the contribution of any or all the components of a programme.

Summative evaluation is undertaken for the purpose of establishing whether a programme has produced outcomes that would not otherwise have occurred and which are of sufficiently high value to warrant their inclusion in future programmes. The role of summative evaluation is, therefore, to investigate "the effects of the whole teacher-curriculum package" (Scriven,1967 p.50).

This concentration on the whole is considered a disadvantage of some summative evaluation since there is no desire to identify the individual contribution of elements to the overall performance of the educational programme. For example, in distance learning the

component of package presentation would be given no special consideration if the entire educational programme were evaluated in terms of performance. Rowntree(1982) refers to formative and summative evaluation as different stages of evaluation and proceeds to advocate that all evaluation is formative. Admittedly, summative evaluation is formative in nature in that it serves to enlighten the decision-making process and the allocation of future resources, thereby forming part of a continuous process of improvement.

Scriven(1967) disputes Cronbach's assertion (1963) that formative evaluation contributes more to the improvement of education than summative evaluation and states;

"Fortunately, we do not have to make this choice. Educational projects, particularly curriculum ones, clearly must attempt to make best use of evaluation in both these roles" (1967 p.43)

It is important to go further in recommending developmental testing prior to the introduction of a new learning system so that teaching methods, materials and facilities can be investigated as part of the preliminary evaluation.

Developmental testing is carried out extensively at the OU (Nathenson and Henderson,1981) and is derived from the validation procedure of programmed learning (Rowntree,1982). This form of evaluation involves observing a small number of students as they work through printed drafts of the learning materials so that difficulties can be recorded and remedial action taken before the course is introduced proper. Despite the fact that not every component of a learning system can be tested in isolation and even if this were possible it would not necessarily constitute an accurate evaluation unless all components

were examined individually and then as an entire system, preliminary and formative evaluation are essential. This is emphasised in the production of distance learning materials because there are often limited opportunities for course writers to interact directly on a face-to-face basis with their target population.

Having resolved the purpose of the evaluation, the second stage of design is that of clarifying the internal versus external dichotomy. This is achieved by deciding the focus of the evaluation in terms of outcomes. The performance on an achievement test by trainees on completing a course is regarded as an internal outcome and their productivity measures one year later as an external outcome. The productivity measures reflect the transfer of learning into the work environment and is not easily assessed unless standards of performance, such as sales turnover figures, exist. Evidently, for an external change to occur the programme must have produced some internal changes, thus the two types of outcomes appear to be linked by a cause and effect relationship.

Scriven(1967) talks in terms of intrinsic and extrinsic evaluation. Intrinsic evaluation involves the appraisal of the teaching instrument itself, such as its content and goals, and extrinsic evaluation calls for an examination of the effects of the instrument on the students, often in terms of the differences between pre-test and the post-test scores. The latter is referred to as 'pay-off evaluation'. Scriven claims that a combination "might be a worthwhile compromise" (p.54).

Rowntree(1982) differentiates between micro- and macro-evaluation; the former is continuous and results in minor correction and

remedies, whereas the latter is planned as a specific evaluation of the whole educational programme. However, as his description develops it is evident that these terms are similar to formative and summative evaluation respectively. He attributes the difference between micro- and macro-evaluation to the nature of the evaluation purpose namely, whether the primary purpose is aimed at sustaining and developing educational programmes for the benefits of current students or those in a future learning situation. This is arguably the same distinction as that between formative and summative evaluation.

Having resolved the internal versus external dichotomy, it is necessary to discuss the goal orientation of evaluation. In short, it is essential to decide whether the evaluation process is going to be goal-centred or goal-free. Scriven(1967) explains how in goal-free evaluation the evaluator is given no prior specification of internal and external outcomes that must be achieved in order for the educational programme to be regarded as a success. Unlike goal-centred evaluation that concentrates on what should be achieved, goal-free evaluation is sensitive to the individual and organisational outcomes related to the programme.

According to Scriven(1967) it is important to distinguish between the goals and the role of evaluation in a particular instance. This requires gathering and combining performance data with a weighted set of goals in order to yield comparative or numerical ratings in justification of the actual evaluation system. He claims;

"Evaluation is itself a methodological activity which is essentially similar whether we are trying to evaluate coffee machines or teaching machines" (p.40).

He goes on to explain how the role of evaluation alters in accordance with certain characteristics of the system. For instance, when the purpose of the evaluation is formative, it is necessary to adopt a goal-centred evaluation approach and the reverse is true of summative evaluation. Scriven states, however, that this need not rule out the possibility of separate goal-centred evaluations.

It is apparent that evaluation design must comprise a combination of formative and summative evaluation. In distance education, the formative evaluation appears to be critical in the production of effective learning materials. Holmberg(1985) examines the role of formative evaluation in distance education and, like Cronbach(1963), criticises an "ends-dominated approach" which is concerned with making the presentation agree with the objectives of the course in so-called pursuit of more efficient learning. "Learner-centred" formative evaluation is recommended. This type of evaluation concentrates on the characteristics and feelings of the students and is therefore compatible with the philosophy of distance education. Mace(1976) describes the purpose of this kind of formative evaluation as examining how well the structure and presentation of the subject have enabled learners to understand and enjoy using the materials. He adds:

"An evaluator would also want to know to what extent students have been able to pursue their purposes and interests through the course, what habits of thought or ways of seeing the world they might already have that may be getting in the way of aiding their understanding" (p.27).

5.3 EVALUATION MODELS

The identification of the major models is apparent in the evaluation literature (see, for example, Stake,1967; Popham,1975). House(1978)

discusses the assumptions underlying evaluation models; for the purposes of educational evaluation the following models are considered: 1. Behavioural Objectives; 2. Systems Analysis; 3. Decision-Making; and 4. Transaction.

5.31 The Behavioural Objectives model.

This model concentrates on experimentation and psychometric traditions (Tyler,1967) and has links with stimulus-response psychology. It is also referred to as agricultural-botany (Parlett and Hamilton,1972) because it involves the control of environmental conditions and specified stimulus in much the same way as a gardener might plant seedlings in a greenhouse and expose them to different conditions and fertilisers with a view to achieving measurable results, such as long stems or increased yields. Consequently, this model examines the objectives of a programme, indicated in terms of specific student performances, that can be measured by either norm-referenced or criterion-referenced tests (House,1978). The data collected is "objective" in that it is amenable to statistical analysis of isolated variables.

Parlett and Hamilton(1972) indicate the potential shortcomings of such an evaluation design; they stress that the parameters of the educational situation must be either randomised or controlled strictly, as a result the individual student engaged in a real-life experience is not examined. This design also assumes that the programme itself is static throughout its course, rendering it inflexible and unable to encompass formative evaluation. Clearly, the chief criticism of the behavioural objectives model is that it is insensitive to the needs and concerns of the participants of the educational programme.

5.32 The Systems Analysis model

This model also assumes certain quantitative output measures (Moors,1979), although to a lesser extent; it aims to relate differences in programmes to variations in, for example, test scores. Other possible sources of data include survey data, cost-analysis, linear programming and planned variation. According to House(1978) efficiency is the goal of this type of evaluation. The systems analysis model deviates from the classic experimental model, even though it is based on objective criteria, because it involves the classification of evaluation interests. In addition, Moors(1981) claims that;

"It is also reasonable to expect that further areas of interest will evolve as the various components and processes of the programme become clarified during the initial stage of the evaluation sequence," (p.136).

Once variables have been measured, "the elaboration of recommendations based upon a consideration of the information" (Moors,1981 p.134) takes place.

Barber, Adderley and Randall(1984) used part of this model in an evaluation of a distance learning programme and found it "especially helpful in clarifying purposes by its systematic analysis of evaluatory interest" (p.183). However, Prosser(1984) who concluded, in support of the findings of Bates(1981), that there are important variables which are often overlooked in this evaluation design, such as the attitudes of the users. This is significant in the field of distance education since it aims to accommodate the attitudes of its participants, including learners, tutors and administrators, into the design and evaluation stages.

5.33 The Decision-Making model

Another evaluation model which according to House(1978) uses quantitative objectivity is the decision-making model.

Stufflebeam(1971) is the major proponent of this model.

Decision-making evaluation applies to related areas of need identification and resource planning as well as the achievement of objectives.

There are four different types of evaluation: 1, context, involving the initial identification of needs and objectives; 2, input, concerning the use of resources and planning aspects; 3, process, monitoring the implementation of a learning programme; and 4, product, measuring and interpreting achievement during and at the end of the process. The evaluation is, therefore, structured by the decisions to be made which form four classes namely planning, structuring, implementing and recycling.

The decision-making model of evaluation tends to employ questionnaire and interview techniques. According to Stufflebeam(1974) the CIPP (Context, Input, Process, Product) evaluation model is not equated with measurement, professional judgement or experimental design.

These methods, he claims, are either too narrow and inflexible, for example, measurement-based designs, or lacking in rigour, as in the case of professional judgement designs, or restricted in terms of the questions addressed, as with the classic experimental design.

5.34 The Transaction Evaluation model

This model concentrates on elements of the educational process, such as the classroom, the institution and the learning programme, rather than its product. Stake(1967) details a 'responsive model' which aims

to "introduce a conception of evaluation oriented to the complex and dynamic nature of education" (p.525). He distinguishes between informal and formal evaluation in an attempt to direct attention towards unintended circumstances. Informal evaluation is recognised "by its dependence on casual observation, implicit goals, intuitive norms and subjective judgement" (p.523). Formal evaluation is characterised, however, "by its dependence on checklists, structured visitations by peers, controlled comparisons, and standardised testing of students" (p.523).

Evidently, formal evaluation follows the guidelines of experimental behavioural objectives and systems analysis evaluation models. For Stake, the first distinction to make when investigating evaluation design is that between description and judgement. For example, achievement tests are descriptive in that they detail the degree of objective attainment reached by individual learners on a particular course. Judgement relies on descriptive data in order to influence decision-makers. Furthermore, Cronbach(1963) believes that since no one person has the breadth of qualifications to make all the judgements involved, it is necessary to have a shared team response.

Irrespective of its immediate purpose, three bodies of information need to be collected according to the stage of the evaluation: 1, antecedent data concerning the conditions existing prior to the teaching and learning which may relate to the outcome, such as the previous experience of the student; 2, transaction data revealing any encounters between the student and the tutor as dynamic components of the overall process of education; and 3, outcome data referring to the results of the educational programme; these are used to measure, for example, the impact of instruction on student abilities.

Stake(1967) advocates that data matrices including description and judgement data are constructed. The matrices are segregated according to the type of information involved, in this way the intents, observations, standards and judgements of the educational programme are entered into the matrices. This model examines the contingency between the antecedent transaction and outcome data, and also the congruency of the intended and observed data.

Research, and subsequent models, that take into account the wider contexts in which educational programmes operate relate to social anthropology and participant observation research in sociology rather than experimental psychology.

Cronbach(1963) believes that the conflict between these two areas of evaluation is exaggerated; he proposes an evaluation programme compiled of more than one type of model. A complementary approach is also urged by Saxe and Fine(1979):

"The data developed from the macro and micro studies should not be viewed as orthogonal. They interact to identify those aspects of the program worthy of investigation by the alternative form of analysis...Data from the two levels feed into each other in a cyclical fashion in order to identify those program elements requiring revision or special attention"(p.64).

Various curricular research models also exist in the literature. Schwab(1969;1971;1973), for example, regards curriculum research as a deliberative process based on practical situations. Reid(1978;1981) develops this approach further; he emphasises the improvement of the current course and curricular with an improvement in the decision-making process. This cannot be achieved by adhering to a series of well-defined steps; it involves the defining and redefining of relevant questions and issues, followed by a discussion between

those concerned and careful consideration of the proposed alternatives. Reid, therefore, suggests that problem-centred study should "interest itself in all styles of research which may help in the definition and resolution of curriculum questions" (1978 p.36).

5.4 INNOVATION

The evaluation of innovations falls into the area of transactional evaluation. Dalin(1976) proposes ten categories by which to assess an innovation (see Fig. 5.41):

1. Centrality; the extent to which an innovation attempts to alter the existing attitude and behaviour of the institution.
2. Complexity; the extent to which an innovation proposes far-reaching, complicated changes.
3. Consonance; the degree of fit between the goals of the innovation and those of the institution.
4. Competition; the degree of interference from other aspects of the institution.
5. Visibility; the extent to which the innovation is observed or monitored by non-participants.
6. Feasibility; the availability of resources and the practicality of implementing the innovation.
7. Support; the financial and psychological backing received from the institution and related institutions.
8. Divisibility; the extent to which the innovation can be introduced in part.
9. Compatibility; the extent to which the innovation can be combined with existing practices.
10. Adaptability; the extent to which the innovation can be modified to suit individual circumstances.

Fig. 5.41 Categories by which to assess an innovation (Dalin,1976).

A framework within which to evaluate innovations is provided by Parlett and Hamilton(1972) in their Illuminative Evaluation model. The emphasis is on holistic studies using qualitative methods of

interviews and observational techniques with less attention being given to quantitative methods and the statistical manipulation of survey data.

The objective of the evaluation is first, to understand the context in which the innovation operates and second, to unravel its complexities and to establish cause and effect relationships. Two key concepts prevail: the 'instructional system'; and the 'learning milieu'. The former attempts to appreciate the fluid structure of the instructional system in different situations. Clearly, traditional evaluation has been built on a foundation of formalised aims and objectives extracted from the instructional system. These form the criteria against which innovation can be measured and outcomes predicted. However, alone it is a very restricted view which fails to indicate how an innovation is implemented and to acknowledge the dialectic nature of the instructional system.

The 'learning milieu' deals with the social-psychological and material environment in which the learners and trainers operate. Its configuration depends on the interplay of many different factors and recognises the uniqueness of the institution and the relationship between innovation and the complexities in which it is entwined. According to Parlett and Hamilton(1972) it represents "a nexus of cultural, social, institutional and psychological variables"(p.208).

However, the key concepts cannot be treated separately since a change in one brings about a reaction in the other. Both are bound up in the intellectual experiences of the learner which in turn are embedded in the managerial framework of the institution or organisation.

Illuminative evaluation is therefore a general research strategy. Its

compilation depends upon the aims of sponsors, the nature of the innovation, the available resources and the expectations of the learners.

For the purposes of illuminative evaluation, Parlett and Hamilton(1972) outline three stages: 1, observation; 2, inquiry; and 3, explanation. Nisbet and Watt(1984) refer to the observation stage as the "open phase"(p.78); the evaluator approaches the institution with no pre-conceived hypotheses but with the objective to become familiar with and to understand the working environment. This process relies on data collection through observation, interviews and documentation. The inquiry stage involves the selection of particular occurrences, phenomena or opinions as topics for more "sustained and intensive inquiry" (p.211). Consequently, the investigation becomes more focused and previously hidden areas are identified. Nisbet and Watt(1984) consider this stage to be essential in order to avoid "a mass of unconnected detail" (p.79). The final stage consists of seeking general principles underlying the organisation of the programme, placing findings into a broader explanatory context and proposing causes and effects within the programme. Alternatives must be interpreted in the light of the information gathered.

Information collection involves some test data but, as Parlett and Hamilton stress, data enjoy no privileged status within the study. Test scores cannot be considered in isolation; they merely form one section of the data profile" (1972 p.213).

Although, like Stake(1967), they indicate the importance of their model in improving the decision-making process, Parlett and Hamilton(1972) believe that its most significant contribution lies in

the collection of relevant descriptive data. Duchastel(1976) refers to this pluralistic approach as an attempt "to exteriorize the deeper, phenomenological impact which the course was hoped to have on a good number of students" (p.64).

Holmberg(1985) points out that illuminative evaluation does not combine action research; he claims that Parlett and Hamilton emphasise that the evaluator makes no attempt to manipulate, control or eliminate situational variables. Abels, Heinze, Horstkemper and Klusmann(1977), however, advocate that the students themselves are not only the objects but also the subjects of the evaluation investigation in that they are encouraged to participate in the process. This kind of action research is carried out with distance learners at the Fernuniversität, W.Germany, (Holmberg,1985).

5.5 INFLUENCING FACTORS

The relationship between the different parties involved in evaluation, including the evaluators, the institution and the learners, is of major importance. The evaluator, for example, is situated in the centre of life at the institution and therefore threatens the established equilibrium. It is vital for evaluators to be accepted in a situation of mutual trust (Nisbet and Watt,1984).

An initial problem is deciding who is going to perform the evaluation. For example, Holmberg(1985) reports, from his 1980 study into how distance education institutions conducted evaluation, that 88% of course designers submitted courses to subject specialists for evaluation. He points out the dangers of this method of evaluation; first, only selected course materials are evaluated since the total learning experience is not evaluated; second, the materials

themselves are criticised on the basis of criteria for traditional educational texts and fail to take into account the particular learning situation of distance learners; and third, the course authors might design materials in order to satisfy the subject specialist rather than the learners. Consequently, subject experts possessing the additional skill of being familiar with distance learning should be consulted in preference to pure subject experts (Nathenson and Henderson,1980).

According to Karow and Storm(1975) the Vocational Education Act (1969) provided for the creation of a Federal Institute for Research on Vocational Education and Training (Sweden), one department of which was given the authority to investigate distance education, to suggest further developments and evaluate distance education courses. Although part of the rationale behind this type of evaluation included the the need to protect the students, the bulk of the evaluation concentrates on the evaluation of distance education according to familiar criteria (Karow and Storm,1975). Similarly, a State Council on Correspondence Education(1949) exists in Norway aimed at maintaining standards comparable to those of conventional education and training. Scriven(1967) advocates that professional evaluators are used only in a 'summative capacity' in order to avoid potential conflict between the external and internal (course writers, for example) contributors to the evaluation process. Evaluation must be a team effort; the role of the students in the evaluation process must not be overlooked. There is clearly a case for the involvement of learners in the evaluation of distance education, by, for example, face-to-face discussions.

Perlberg(1979) looks at the motives for evaluation; he points out

that evaluation often takes place in answer to needs for reward and accountability. Also, the evaluation of instructors rather than of the instructional system is widespread (Rotem and Glasman,1977). The motives largely reside in the political nature of evaluation. MacDonald(1974) was the first to give priority to the political aspect of evaluation with his Democratic Model. The model depicts evaluation as an information service gathering the definitions and reactions of participants to the innovation. Lakomski(1983) criticises the model for its failure to examine the political questions regarding the conception and implementation of the innovation, believing it is essential to consider the administrative, financial and the political factors influencing the innovation.

Lakomski(1983) regards successful evaluation as a matter of choice within the components of the innovation (formative evaluation), between innovations (summative evaluation) and the policy-making process of the institution (democratic evaluation).

5.6 DISTANCE EDUCATION

The exposure of durable relationships between learners and their instructional materials is particularly relevant in the case of distance education, where the learner often relies exclusively on mediating material for motivation, as well as instruction and feedback. Consequently, Rumble(1981) encourages a structured evaluation process;

"The complexity of distance learning systems, the distance that separates the student from the institution, and the separation between the design of the materials and their teaching that occurs in large-scale multi-media systems require that there is a more structured evaluation system" (p.71).

Many distance education courses are multi-media involving several types of technology ranging from print to interactive video. McIntosh(1974) acknowledges that although there is not a "perfect formula" for evaluating the composite effects of a multi-media course, she recommends a four-tiered method of evaluation based on: 1, the need or demand for the course; 2, the effectiveness of the whole course for the users, educators and purchasers of the programme, as well as outside educationalists; 3, the individual units; and 4, the impact of each individual component of the system.

"A distance education institution is considered as a system with identifiable interacting sub-systems. A data model can be developed and used to monitor and evaluate processes and outcomes. This involves identifying significant, representative, analysable and objective data and indicators of performance; thus the effectiveness and efficiency of the sub-systems and institutions can be assessed" (Tate,1985 p.103).

Tate(1985) offers three categories by which distance education can be evaluated: 1, the procedures for design, development and production; 2, the quality of the system in terms of, for example, the theory of course objectives, feedback methods and assessment plans; and 3, the effectiveness of the course, its distribution, tutorial and other support sub-systems on the achievement of the students. He lists the indicators of effectiveness as information gained from the enrolment and withdrawal statistics, student reaction sheets at the end of each unit and questionnaires at the end of the course, the time taken to complete the units/course, results in tests and public examinations, group discussions with students and employers and student misunderstandings.

Souleimis(1977) indicated a number of tests that might be used to

evaluate output. First, the response time test (from entry to graduation); second, the input-output ratio (the number of students admitted compared to the number who graduated); third, the correctness of output (the achievement of both student and institution objectives); and fourth, cost-efficiency and cost-effectiveness.

5.7 COMPARATIVE STUDIES

Scriven(1967) indicates the problems of evaluating two forms of educational programmes in order to compare them;

"...when we come to evaluate the curriculum, as opposed to merely describing its performance then we inevitably confront the question of its superiority or inferiority to the competition" (p.64).

He points out if no explanation of the difference is necessary, small-scale, well-controlled summative evaluation studies can compare versions of the same course. If, however, an explanation is desired, it is vital to carry out more control groups and short-run studies than is usually necessary for summative evaluation, even then extra effort is called for because of the experimental conditions.

Cronbach(1963) warns against generalisation from curriculum comparison studies since the difference in purpose between the educational programmes may be too great. Furthermore, Stake(1967) states that the conclusions reached by comparative studies largely reflect the aims and values of the sponsors.

According to Hartley(1972) evaluation studies comparing conventional and programmed instruction have serious limitations if they are not based individually. He stipulates that any comparative study should

involve the same content, be taught optimally, include a statement regarding the length and type of programme, how it is presented and the number of students engaged.

In reference to distance education, the comparison of media against specific types of learning objectives is tackled by Romiszowski(1972). However, it is important not to overlook the fact that forms of media do not always compete with each other since they are usually complementary in nature.

The evaluation of output has no reflection on the effectiveness or efficiency of the internal functioning. Holmberg(1985) claims that student attitude is more widespread than test data as a means of evaluating distance education programmes. In order to evaluate the specific internal operations, it is necessary to concentrate on the student characteristics, educational background (skills and qualifications, for example), occupational and environmental details (office and home facilities for studying, for example) characteristics. The curriculum must also be evaluated along with the course materials. Moreover, sub-systems, such as tutorial support, administration and the decision-making process, must be investigated in order to establish an understanding of all levels of the internal functioning of the system.

The essential features of course evaluation for distance education programmes are outlined by Rawson-Jones(1972). He includes: 1, a definition of the target population; 2, a definition of the objectives of the course; 3, a decision on which objectives are to be measured; 4, the establishment of a standard of student achievement; 5, the selection of instruments and procedures to be used in the evaluation process;

6, the establishment of a procedure for retrieving, coding and storing information; 7, a mechanism for comparing student achievement with standards; 8, its implementation; and 9, drawing conclusions and advancing recommendations leading to action in the light of the results.

5.8 CONCLUSION

It must be stressed that any evaluation must be based on a functional theory which takes account of the individual characteristics of educational and training programmes. A theory of evaluation is important in order to provide a framework within which evaluators can structure programmes and analyse results. A theory which is flexible enough to accommodate the different needs of evaluators and learners must incorporate a combination of evaluation models. The Behavioural Objectives model is too rigid for distance learning in that it does not allow for unintended outcomes to be observed and assessed. The Systems Analysis model has some scope for interesting questions to be raised but relies too heavily on the system of education rather than on the participants of the system. Similarly, the Decision-Making model concentrates on the entire system without emphasising any one component. Consequently, the Transaction model is preferable for the purposes of distance learning because it concentrates on the unanticipated and informal aspects of the educational experience.

Within the Transaction model, a learner-centred approach enables the experiences, feelings and attitude of the participants to be examined. It is essential to place these feelings in the context of the learning experience.

The context of distance learning distinguishes it from other forms of

education; a study of the learning milieu provides an insight into the attitudes of the participants and therefore the success of the programme. Dalin's classification is one means of focusing the effort and attention of the evaluator so that factors which influence the programme are not overlooked at the onset. In order to collect and record the necessary information, it is a question of utilising the resources available. The limited use of measurement tests is acceptable provided they are also used to reinforce subjective data from interviews, group discussions and observation.

The main source of information is the students; their attitudes towards the educational programme will determine not only their own performance but also the success of the programme as a whole. The role of formative evaluation is that of enabling evaluators to anticipate the motivation and performance of future participants based on a full understanding of the target population. Preliminary formative and summative evaluation must be learner-centred, stressing the viewpoint of the participants but with the flexibility to encompass the instructional system, the learning milieu and ultimately the transfer of the educational experience into the workplace. Successful evaluation occurs when evaluators understand the feelings of the learners and can convert them into tangible data to enable them to incorporate amendments into existing systems and revisions into future educational and training programmes.

6.1 INTRODUCTION

The importance of learning styles in education and training has been recognised relatively recently by educational psychologists and professional trainers. It has become even more apparent as new methods of learning have been introduced which provide trainers and their students with the opportunity of selecting a method best suited to the characteristics of individual learners. The study of learning styles is one way in which this can be achieved; instruments are available which enable students to establish their own learning style. As a result, particular methods of learning which either supplement or complement the existing learning can be adopted so that the performance and the satisfaction of students can be ameliorated. Clearly, in the case of distance learning there is huge scope for research since the philosophy of this form of education is geared towards the interests and preferences of the individual learner.

6.2 LEARNING STYLE RESEARCH

Recently there has been substantial evidence in the literature indicating the prevalence of learning styles; Thomas(1971) looked at reading styles; Klix(1971) examined concept acquisition; Strub and Levut(1974) and Tversky and Kahneman(1975) considered decision style and Dirkzwager(1974) studied logical problem-solving styles.

An early example of style division was illustrated by Jung(1923) in the form of psychological types. Jung proposed that the individual interacts with the world in two ways in the course of acquiring and using information; information is acquired by means of a sensing or an intuitive approach. The former involves measuring, weighing up and

identifying information in a specific way, whereas the latter chiefly involves the use of insight. These two different means of acquiring information are considered as distinct from one another, forming opposite ends of a "perceptual function" continuum (Fig. 5.21) thus,

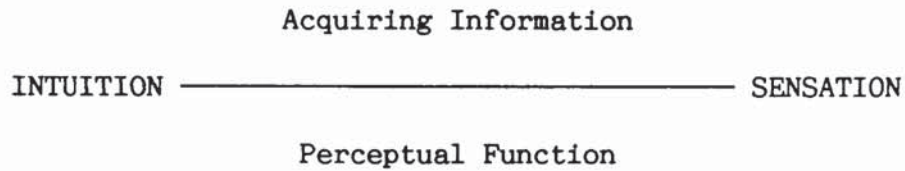


Fig. 5.21 The Perceptual Function (Jung,1923)

The use of the acquired information is polarised into functions of thinking and feeling, these form the opposite ends of the "judgement function" (Fig. 5.22).

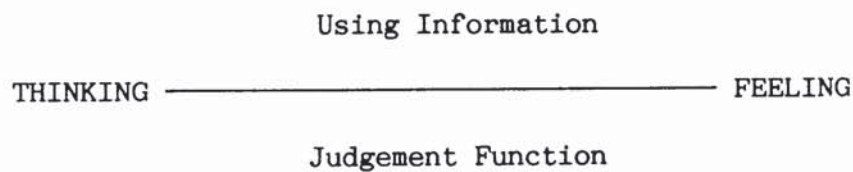


Fig. 5.22 The Judgement Function (Jung,1923)

The person who prefers the thinking approach exhibits a tendency to make decisions on the basis of the facts available, consequently a logical, analytical and detached decision-making process results. The person who prefers the feeling approach makes decisions according to her/his personal beliefs.

Research subsequent to Jung's was also defined in terms of polar opposites. Two of the best known works on cognitive style derive from perceptual tasks, namely identifying embedded figures (Witkin, Moore,

Goodenough and Cos,1977) and matching familiar figures (Kagan, Rossman, Day, Albert and Phillips,1964). From his interest in perception, Witkin developed longitudinal as well as cross-sectional verification of the existence of different cognitive styles. He carried out several studies over eight years with subjects of all ages and educational levels. According to Witkin (1976);

"...all of us have characteristic modes of functioning that we reveal throughout our perceptual and intellectual activities in a highly consistent and pervasive way. We call these modes of functioning cognitive styles" (p.39).

His original experiments involved tilting people to establish to what extent they were dependent upon visual cues to recognise the perpendicular. This test is referred to as the tilting-room tilting-chair test. Test subjects were required to locate their body in relation to the true vertical. People who could determine the perpendicular despite interference from tilted surroundings were called field independent. Those who could not were called field dependent.

The testing became simpler with the introduction of the luminous rod-luminous square frame test which requires the subject to position the rod on the vertical axis. However, Witkin's most widely cited test is the Embedded Figures Test (Witkin, Moore, Goodenough and Cox,1977) in which subjects are required to identify a simple geometrical shape within a complex figure. Varieties of tests using this sort of pattern have been designed for different age groups and for use by groups rather than individuals.

Those who had trouble overcoming the interference in the tilted

chairs and rods tests also displayed trouble overcoming the influence of complex superimposed designs. Therefore, field independent individuals find this test easier than field-dependent individuals who perceive their visual information as a whole. In intellectual activities they also have a more articulated and analytic cognitive style than the field dependent individuals whose cognitive style is global by nature. Consequently, Witkin(1976) claims;

"Because it has a too specifically perceptual connotation, the label 'field independent' did not seem appropriate for this broader dimension. Accordingly, we adopted the designation "analytical-global field approach" (p.180).

The field independence/dependence and global/analytical argument bears some similarities to the nonanalytical versus analytical model of Kagan, Rossman, Day, Albert and Phillips(1964). Later, it became common to look for gradations of type rather than two extremes since;

"...in reality individuals are distributed continuously between the two extremes with considerable variation in the cluster and degree of components comprising the style" (Witkin,1976 p.38).

Witkin considered the interaction effect as he investigated people who altered their style from on extreme to the other when placed in different contexts. Field dependent people, for example, who relied on their personal beliefs (comparable to the feeling approach of Jung,1923) might have been trained to apply a logical process (comparable to the thinking approach of Jung,1923) while performing mathematics tasks at work. They might, however, revert back to decision-making governed by personal beliefs away from the work environment.

Kagan, Rossman, Day, Albert and Phillips(1964) examined reflection versus impulsivity determined by the speed and accuracy in which alternative hypothesis were formed in potential learning situations. His study, involving children, demonstrated how some subjects responded extremely rapidly and impulsively, while others were more reflective. He suggests that impulsivity may be related, for example, to what he refers to as "constitutional predispositions", hypo-activity and anxiety about the task. Moreover, hypo-activity is related minimally to the formation of analytic concepts. Thus, a very active orientation towards learning situations inhibits reflection and thereby precludes the development of analytic concepts.

Singer(1968) found that children with active fantasy lives were more capable of inhibiting actions for long periods of time than those children with little internal fantasy life. However, according to Jarvis(1987), it must be noted that;

"...impulsiveness and intuitive thinking are similar to each other but that they are not the same process. Additionally, it might also be true to claim that people with a high degree of self-confidence might also be more prone to reflect prior to action than the less confident" (p.173).

The studies by Kogan and Wallach(1964) yield a similar model to that of impulsivity/reflectivity which they refer to as the risk-taking/caution model. Like impulsivity, risk taking is characterised by the tendency to take chances even when the likelihood of success is poor, whereas a reluctance to take chances except when the likelihood of success is great is a characteristic of caution.

The study of personality through perception and the study of

individual differences in perception was investigated by Harvey, Hunt and Schroeder(1961). They studied complexity versus simplicity according to individual differences in construing the world. Complexity is characterised by the use of hierarchic integration, while simplicity is revealed in the use of dimensions of difference. Particularly relevant to the research into personality and creative thinking and the science versus arts bias were the studies by Getzels and Jackson(1962) and Cronbach(1968). These investigated the extent of a person's reliance on logical and conventional or divergent and varied thinking.

Pask and Scott(1972) distinguished between "holists" and "serialists" according to how individuals classified two imaginary Martian animals. Similar findings were obtained when the individuals were asked to explain to the tester how they reached their conclusions ("teachback"). Holists exhibit a global approach; their aim is to construct a broad view of the learning task which integrates their real-life experience. There are two sub-categories of holist called irredundant holists and redundant holists:

"Students of both types imagine an entire system of facts and principles. Though an irredundant holist's image is rightly interconnected, it contains only relevant and essential constituents. In contrast, redundant holists entertain images that contain logically relevant or overspecific material, commonly derived from data used to "enrich the curriculum, and these students embed the salient facts and principles in a network of redundant items" (Pask and Scott,1972 p.218).

It is important to point out that the logically irrelevant items are of psychological significance because they are used "to access, retain and manipulate" the relevant items actually required to be learned (Pask and Scott,1972 p.219).

Serialists follow a linear progression from one hypothesis to the next with the intention of reaching an understanding from the component details;

"An individual student may be good at seeing things as "parts of a whole" or, conversely, he may have a special aptitude for "stringing sub-problems into sequences" which (on resolution) lead to the solution of a large problem" (Pask,1969 p.250).

In a later series of studies, Pask and his colleagues developed their descriptions of these learning strategies. For example, holists were found to look further ahead when requested to work through a hierarchy (Pask,1976). Their attention of focus was wide, involving several sub-topics from the outset (Robertson,1977). Pask's "conversational theory" (1976) examined how students reach a full understanding. Pask argues that behind these specific strategies are distinct learning styles; holists revealed a predisposition to adopt holist strategies even when the task required a serialist strategy. This preference for displaying a holist strategy he described as "comprehension learning", whereas a preference for a serialist strategy, "the facet of the learning process concerned with mastering procedural details" (Entwistle,1981 p.94), is referred to as "operation learning". A pure operationalist climbs vertically on a domain map and cannot transfer to other areas, whereas a pure comprehensionist sees analogies everywhere but cannot employ any concept in a practical way.

There are students, however, who are able to adapt their learning strategy readily to suit the requirements of a given task thereby emphasising either comprehension learning or operation learning. Pask postulates that to reach a full understanding of many academic

topics, it is necessary to pursue both learning strategies. He refers to students displaying this phenomena as having a "versatile" theory of learning.

Witkin sees differences in cognitive style as representative of personality differences. Eysenck(1965) describes introverts in relation to their tendency to shun social situations and to avoid any impulsive action. Jung(1938) portrays introverts as inward-looking and as ruled by subjective determinants whereas extraverts are outward-looking and dominated by the immediate environment. There appears to be some similarities between Witkin's field-independent person, the deep-level processor of Pask and Jung's introverted thinking type.

Marton and Säljö(1976) examined qualitative differences in the partial understanding expressed by a student having read an article. They identified a fundamental difference in learning strategy between a deep-level approach and a surface-level approach. The former looks for main ideas and arguments and evaluates them in terms of the available evidence and by drawing on previous knowledge and experience. The latter concentrates on learning isolated facts; it would appear that for them isolated ideas are more important than the overall meaning of the text. According to Svensson(1976), students maintain the surface processing approach even when it is ineffective to use it, when carrying out in-depth analysis for example.

6.3 EXPERIMENTAL LEARNING AND LEARNING STYLE

In the field of experimental learning, Kolb has recently made a major contribution with his work on the experimental learning cycle (Kolb,

Rubin and McIntyre,1974) and the resultant Learning Style Inventory (LSI) (Kolb,1976). Although Kolb's work is also essentially based on Jungian psychology, he brings together the early social psychology literature, including the classic studies by Lewin, Lippit and White(1939) on leadership which indicated that learning is best facilitated in an environment of dialectic tension and conflict between immediate, concrete experience and analytic detachment. Kolb also considers the sensitivity training and the laboratory education work of the 1950's and 1960's (Kolb and Fry,1975). In short, he assimilated information from research by Jung, Piaget, Hudson, Bloom, Freud, Lewin and Rogers (Kolb and Fry,1975).

Kolb stresses that experimental learning is not a molecular educational concept rather;

"...a molar concept describing the central processing human adaption to the social and physical environment" (1975 p.40).

The experimental learning model is, therefore, a means of mapping developmental paths and it is also a "normative adaptive ideal - a learning process wherein the individual has highly developed abilities to experience, observe, conceptualise and experiment" (1975 p.41). According to Kolb's experimental learning theory new knowledge, skills and attitudes are achieved through confrontation among the different perspectives in the learning process. Concrete experience (CE) is followed by observation and reflection (RO) which leads to the formation of abstract concepts and generalisations (AC) resulting in an hypothesis to be tested in future action involving new experience (AE) (Fig. 5.31).

detachment. Cognitive psychologists believe this dimension to be contributory to individual growth and development; a tendency towards concreteness encourages, for example, an immersion in and a domination by one's immediate experiences, conversely a tendency towards abstractness encourages, for example, reflection from one aspect of situation to another (Goldstein and Scheerer, 1941).

The second dimension of Kolb's experimental learning model has active experimentation and reflective observation as polar opposites. This continuum, therefore, ranges from the preference to become involved in a situation through to the preference to observe a situation. Margerison and Lewis (1980) refer to this dimension as "the preferred learning role"; at the one end is the person who prefers a role of observation and at the other, the person who prefers to participate actively in the learning situation.

Cognitive growth requires the nature of the learning process to become more reflective and internal as covert action is superseded by the manipulation of symbols and images. Indeed, an extreme tendency towards one of the polar opposites of this dimension precludes the development of the other (Kagan, Rossman, Day, Albert and Phillips, 1964; Singer, 1968). According to Kolb, the way in which individuals deal with these two dialectic tensions in the form of concrete versus abstract and active versus reflective determines their learning style.

Before citing Kolb's research into learning styles in detail, it is important to outline other characteristics of his model. First, the learning cycle is continuous; individuals test concepts in new experiences. Second, the nature of the learning is determined by the

individual's own goals and needs which comprise the objectives of the learning process. Third, since the learning process is ongoing and is determined by personal needs, the resultant learning style is uniquely adapted to the individual. Each individual learning style is likely to have so-called strengths and weaknesses (Kolb,1976).

Fourth, the learner is centrally placed in the learning process and the learning process is centrally placed in everyday life.

Therefore, like Kelly(1955), Kolb considers the learner to be an active experimenter and problem solver; learning is not a special activity reserved for the classroom (Kolb,1976).

6.4 TESTING FOR COGNITIVE STYLE

John(1957) noted the time it took subjects to solve a problem, the number of questions asked, the rate at which the questions were asked and the logical exhaustiveness and redundancy of these requests. He demonstrated stylistic differences between students of natural sciences and students of physical sciences. However, the constrained conditions under which the study was undertaken render the possible extrapolation of these results very difficult (Growchow,1973).

The "uses of objects" test was employed by other investigators (Getzels and Jackson,1972; Guilford,1962). An example is: "List as many uses for each of the following everyday objects as you can: a brick, a paper clip, a spoon." Hudson(1966) used it as a measure of differentiation between convergers and divergers. The "self-report" questionnaire or inventory is another type of test, for example, the Job Analysis and Interest Measurement Test (Cross,1970). This involved self-rating on 154 "Bipolar adjective scales which were scored along 28 different factors. Cross highlighted differences between the cognitive styles of computer programmers and non-programmers.

6.41 The Learning Style Inventory

The Learning Style Inventory (LSI) (Kolb,1976) is an example of a self-report method of testing cognitive styles; Kolb designed the LSI as a tool to measure learning styles according to the experimental learning theory. He aimed to enable learners to establish their own learning style, to be aware of its consequences and to discover how it could be improved by taking other learning styles into consideration. There were three design objectives: the test should be brief and straightforward so that it could allow learners to gain feedback on their learning style; the instrument would simulate a real-life situation in that it would involve the resolution of the tensions between polar opposites; and finally, the learning style established by the LSI would predict behaviour in a way that was consistent with Kolb's experimental learning theory.

The instrument he subsequently devised was a nine-item self description questionnaire (see Appendix V). Each item requests the respondent to rank four words in order of their accuracy in describing her/his learning style. Each column refers to one of the four learning abilities measurable by the LSI. For example,

"discriminating : tentative : involved : practical"

and

"feeling : watching : thinking : doing".

Kolb includes the forced-choice ranking format of the LSI essentially by way of fulfilling the criterion of "ecological validity" (Brunswick,1943). He proposes that a test of learning styles should be constructed in such a way that there must be a conflict of choice between the four learning modes as there is in real-life. A further

reason for using this format was the social desirability response set. According to Edwards(1953) any variation in responses to self-report instruments such as the Likert scale or true-false formats is influenced greatly by the tendency to rate oneself highly on items that are socially desirable. Kolb employed a panel of four behavioural scientists with the objective of balancing the social desirability of the four words in each item, thereby eliminating bias from the responses.

The inventory yields six scores, one for each of the learning abilities (CE, RO, AC, AE) and two combination scores that indicate the extent to which the individual emphasises the first dimension of abstractness versus concreteness (AE-CE) and the second dimension of active experimentation versus reflection (AE-RO). Statistical studies carried out by Kolb and his colleagues revealed four different learning styles measurable by the LSI. A four-cell matrix indicates these styles, with diagonals revealing opposite styles (Fig. 5.41).

	Active	Reflective
Concrete	Accommodators	Divergers
Abstractness	Convergers	Assimilators

Fig. 5.41 Matrix of learning styles: Kolb (1976).

It is worthwhile examining some of the work of Piaget(1951) in this field; Piaget identified four major stages of development in the learning processes of children. The enactive learning stage (0-2 years) involves learning through use of the senses, such as feeling and touching. This has obvious similarities with the accommodator.

The second stage is the ikonic stage (2-6 years) when learning occurs as a result of the manipulation of observations and images. A diverger emphasises this kind of learning style. By the third stage (7-11 years) learning is governed by classes and relations and is inductive in nature. This tendency corresponds to that of the assimilator. The final stage (12-15) years involves hypo-deductive reasoning and is, therefore, representative of the converger's learning style.

Each learning style has certain learner characteristics. The accommodator scores highly on CE and AE. S/he excels in carrying out plans and experiments. Carlsson, Keane and Martin(1976) point out that the term "executor" is perhaps preferable to that of accommodator since the latter creates the impression of a passive and compromising learner, whereas the characteristics of this style imply a more dynamic learning process.

The accommodator is a risk-taker who tends to solve problems in an intuitive trial-and-error manner relying heavily on other people for information (Kolb,1975). This dominant learning style tends to be prevalent amongst graduates in business studies and also among managers.

The diverger scores highly on CE and RO. Her/his strengths lie in an imaginative ability and s/he is essentially "person oriented". This learning characteristic is shared by many people of humanities and liberal arts backgrounds (Kolb and Goldman,1973). The converger is opposite in learning characteristics to the diverger. S/he scores high on AC and AE and excels in the practical application of ideas on specific problems where there is likely to be only one solution. The

converger is relatively unemotional, preferring things to people and is often found in an engineering discipline (Kolb and Goldman,1973).

The assimilator scores highly on AC and RO. Her/his strength lies in the ability to generate theoretical models and to integrate disparate observations into meaningful explanations. Kolb and Goldman(1973) consider this learning style to be widespread in research and planning fields.

The connection between academic and vocational choices and learning style is based on the relevance of particular cognitive skills to that area. Indeed;

"The evidence is now clear that cognitive style is an important variable in the preferences students express and in the choices they actually make at the various points in their academic development when options are available to them" (Witkin,1976 p.47).

As a result of considerable research involving students at different educational levels and using a variety of inventory forms (see, for example, Clar,1971; Glatt,1969; Krienke,1969), field independent students appear to favour domains requiring analytical skills, whereas these domains are largely avoided by more field dependent students. In addition, field dependent students seem to prefer domains involving interpersonal relations.

Witkin(1976) draws the same conclusions from the distribution of males and females in professions; men tend to exhibit interest in areas demanding analytic skills; women tend to prefer activities involving dealing with people, claims Witkin. (However, this phenomena is more a description of the assignment of sex roles within

society than a consequence of preferred learning style.) It is important to mention that there is variation within as well as between professions; high achieving students in psychiatric nursing were significantly more field dependent than were high achieving students in surgical nursing, who tended to be more field independent (Witkin,1976).

6.42 The Learning Style Questionnaire

Although their empirical research yielded learning styles different from those of Kolb, Honey and Mumford(1982) acknowledge the contribution of Kolb to this field of research. However, it is apparent that Honey and Mumford are concerned essentially with the provision of a practical instrument relevant to the learning styles of managers.

"The LSI is based on response to 36 words (not sentences) which do not describe managerial activities; as a bias for the attribution of styles we found them less pervasive both to us and to managers," (Mumford,1982 p.24).

They devised an alternative to the LSI and referred to it as the Learning Style Questionnaire (LSQ). The questionnaire comprises eighty items based on "recognisable statements of managerial behaviour" (Honey and Mumford,1982). The respondent has to either respond to the question with a tick or a cross according to whether s/he agrees or disagrees on balance. For example,

- 17. I'm attracted more to novel, unusual ideas than to practical ones.
- 36. It worries me if I have to rush out a piece of work to meet a tight deadline.
- 44. In meetings I put forward practical realistic ideas.

Honey and Mumford's research into learning styles, like Kolb's,

yielded four different learning styles namely activists, reflectors, theorists and pragmatists, and each learning style has individual characteristics. The activist is dominated by immediate experiences. S/he is open-minded and tends to have an "I'll try anything" attitude. Conversely, the philosophy of the reflector is "look before you leap". S/he tends to observe experiences from different perspectives. The theorist adapts and integrates observations into logical theories; s/he prefers to analyse and synthesise information. The pragmatist likes to put new ideas into practice; s/he tends to be impatient with open-ended discussion and dislikes "beating around the bush".

6.5 VALIDITY OF LEARNING STYLE RESEARCH

Early research by Witkin is questioned by Vernon (1969); he points out that many of Witkin's tests, especially the Embedded Figures Test involve spatial ability as well as general intellectual competence. Furthermore, Cashdan and Lee(1971) claim,

"Witkin's dimension thus probably gives rather more information about people at the extremes than about the rest of us," (p.38).

The research into convergent versus divergent cognitive style which indicates the degree of the individual reliance upon logical variant thinking (Cronbach,1968), also appears to reveal more about the characteristics of those at the extremes than those nearer the middle of the style continuum. For example, convergers are held to score more highly on intelligence tests than on those with open-ended questions, while for divergers the reverse is reported. Getzels and Jackson(1962) found there to be low correlations between different open-ended tests of +0.3 +0.4 and open-ended and intelligence tests

of +0.2 +0.3. Hasan and Butcher(1966) found "relatively unselected group measures of convergent and divergent thinking very largely overlap". Indeed, Kogan(1976) admits there is a lack of firm evidence on inter-relationships between different measures of cognitive styles, "neither completely independent nor completely overlapping their interest "(p.120). Lewis(1976) is critical of the current state of research into cognitive styles. Entwistle(1981) goes further in stating:

"...such caution is justified. Each style, as well as each strategy, depends to a certain extent on the particular tests or tasks used to define it", (p.216).

However, the research into experimental learning theory and learning styles by Kolb has been cited as a major contribution to our current understanding of this topic; according to Kolb(1981),

"there is substantial empirical support for the theory of experimental learning using different operational definitions of the theory's constructs in addition to the LSI, and including replications of certain findings by independent investigators" (p.290).

The LSI has been widely used (see, for example, McMullan and Cahoon,1979). Randolph and Posner(1979) used the learning style theory and the LSI as a means of providing a device for selecting appropriate pedagogical techniques according to situational contingencies. Gray, Quick and Laird(1979) used the LSI and learning style theory for theoretical purposes; Catalanello and Brenenstuhl(1978) used them for research purposes. In short, as Freedman and Stumpf(1980) stress "various researchers have apparently accepted the theory and have applied it to improve management education" (p.445). However, they go on to claim that much of the empirical evidence for Kolb's work comes from unpublished research, thus

"Little empirical research on the LSI has been published in academic journals or other publications that require a rigorous independent review", (Stumpf and Freedman, 1981 p.297).

Factor analysis from their study found weak support for the theory in so far as the two bi-polar dimensions that emerged accounted for only 20.6% of the item variance. In reference to the LSI, they conclude "it is designed so that its results spuriously corroborate the theory" (p.445).

Research by Lamb and Certo (1978) questions whether the format of the LSI forces respondents into the four conceptual boxes provided. In an experiment which generated 1,000 random responses to the LSI and intercorrelated the resulting scale scores as a measure of built-in bias, they obtained correlations of AC-CE = -.26, AC-RO = -.35. The forced-choice ranking format of the LSI is also criticised by James (1980); he claims that the results of the LSI are biased since they always support the underlying theory by necessitating a high score on one dimension at the expense of a low score on the other. Moreover, Freedman and Stumpf (1980) cite research that questions the reliability of this instrument when subjects are re-tested, they claim;

"These results suggest that the LSI is not a reliable instrument, and they are consistent with the low reliabilities reported by Kolb (1971)" (p.446).

In response to the question of the validation of the experimental learning theory and the LSI, Kolb (1981) cites substantial empirical evidence (see, for example, Carlsson, Keane and Martin, 1976; Clarke, Oshiro, Wong and Yeung, 1977; Fry, 1978; Gish, 1980; Kolb, 1981; Manring, 1979; Plovnick, 1975; Sims, 1980; and Wolfe and Kolb, 1979).

Kolb emphasises that;

"All published versions of the LSI stress that the inventory is only a starting point for understanding one's approach to learning that should be supported by other data about how one learns," (1981 p.290).

In addition, Gypen(1980) studied ratings by professional social workers and engineers concerning the extent to which they were oriented toward each of the four learning modes. The ratings were correlated with LSI scores recorded four to six months earlier. His findings support the existence of a negative relationship between opposite poles of the two learning style dimensions and thereby provide external validation to the LSI. There was also suggestion of a relationship between learning style and the learning or behavioural norms of the chosen career field.

Regarding the reliability of the LSI, Kolb(1981) stresses that learning styles represent preferences for, not the exclusion of, one mode of adaptation over others. Consequently, they vary from time to time and from situation from situation. Indeed, variability appears essential since change and adaption to environmental circumstances are central to any concept of learning. He noted;

"The danger lies in the reiteration of learning styles into fixed traits, such that learning style types become stereotypes used to pigeon-hole individuals and their behaviour"(p.29).

The validity of the Honey and Mumford's LSQ has also been questioned but as they point out the validity of a questionnaire is hard to determine especially in the area where there are few established questionnaires to draw comparisons with (Honey and

Mumford,1982). A comparative study of the Kolb LSI and the Honey and Mumford LSQ was carried out by Cross(1984);

"...the research established that the Kolb LSI and the Honey, Mumford LSQ were in fact measuring different aspects of learning"(Cross,1984 p.145).

Cross(1984) states that the LSQ does not measure learning styles in terms of identifying preferences along the continuum of the bi-polar opposites. Consequently, it is not representative of Kolb's theory nor Jung's notions of psychological types and cannot therefore be considered as an alternative instrument to the LSI;

"...the LSQ descriptions are written more as personality types than in the form of learning skills, or abilities", (Cross,1984 p.119).

6.6 TERMINOLOGY

The need to distinguish between cognitive styles and cognitive strategies is cited in the experimental learning literature (see, for example, Messick,1976). The term "cognitive style" refers to high level heuristics which organise and control behaviour across a wide variety of situations, whereas "cognitive strategy" describes decision-making regularities in information processing which forms part of a function of the conditions of a particular situation (Bruner, Goodnow and Austin,1956). Entwistle(1979) emphasises the element of personal choice in his descriptions of cognitive strategy and cognitive style. He regards cognitive style as a characteristic of an individual's preferred way of tackling learning tasks in general. A cognitive strategy, however, is considered in a much narrower sense, it is determined by the way an individual chooses to tackle a learning task in the light of its perceived demands.

Witkin(1976) presents cognitive style as a personality dimension, with individuals differing in the degree to which they are oriented towards the independent and dependent poles. The amount of variance reported in test correlations, however, is sometimes reported to be attributable to the context in which the test is monitored; people occupy a range on a personality dimension, their exact location dependent upon the particular environmental context (see, for example, Wapner, Kaplan and Cohen,1973).

Another difference between cognitive style and cognitive strategy involves the nature of their relationship to training. Cognitive styles develop experimentally and slowly and do not appear to be easily modified by training or tuition, report Kagan and Kogan(1970). Cognitive strategies, however, are more amenable to change (Pask and Scott,1972). Messick (1976) states;

"Cognitive styles may entail generalised habits of information processing, to be sure, but they develop in congenial ways around underlying personality trends. Cognitive styles are thus intimately interwoven with affective, temperamental, and motivational structures as part of the total personality" (p.7).

6.7 FACTORS INFLUENCING STYLE

According to Kolb and Fry(1975);

"As a result of our hereditary equipment, our particular life experience and the demands of our present environment most people develop learning styles that emphasis some learning abilities over others...Each of us has, in a unique way, developed a learning style that has some weak and strong points" (p.31).

Although Kagan and Kogan(1970) report the development of cognitive styles is slow and dependent upon experience, people seem strikingly

stable, even over many years, in their characteristic cognitive mode (Bauman,1951; Witkin, Lewis, Hertz, Machover, Meissner and Wapner,1954).

The notion that there may be a relationship between field dependence/independence and social reinforcement, especially with child subjects has been researched widely (see, for example, Ruble and Nakamura,1972). The evidence suggests that field independent people are likely to learn more than field dependent people under conditions of intrinsic motivation rather than conditions of extrinsic rewards, such as cash incentives and bonus schemes. Criticism, however, has a greater impact on the learning of field dependent people (Witkin,1976).

In relation to environmental factors influencing cognitive style, it is anticipated that shifts in style occur in response to special features of the environmental context within which the learning is operating; certain individuals becoming more field dependent in the presence of aggressive teachers than they would in the presence of submissive teachers (Wapner, Kaplan and Cohen,1976). McKeachie(1962) and Katz and Sanford(1962) have stressed the importance of considering environmental characteristics in determining optional teaching methods. Siegal(1968) claims one of the major deficiencies in research is the reluctance to consider different learning environments for different types of learners. Indeed, Fry and Rubin(1972) found that factors external to the classroom/courses played a central role in altering the expectations and behaviour of students. These factors include peer groups norms, informal study sessions and general feedback from staff; such factors had a major impact on the extent to which students benefited from individual courses.

From their investigation into how people with different learning styles relate to different learning environments, Kolb and Fry(1975) discovered that the classroom learning environment was most helpful to learners with the accommodator learning style and least helpful to the assimilators. Open-ended and unstructured, self-diagnostic instruction was found to be most valuable to divergers whilst convergers preferred the instruction to be linked strongly to their real-life experience. Kolb and Fry(1975) concluded by stressing the need for more systematic examination concerning how learners view their learning situation; they claimed that the data emphasise "the need for a more specific micro-level analysis of environmental factors" (p.53).

The outline of four principles for the design of effective learning environments was stated by Moore and Anderson(1969) namely: the autotelic principle; the perspectives principle; the productive principle; and the personalisation principle. The autotelic principle indicates that students should be free, in a sense cut off, from the real world during the learning process. Students are, however, responsible for their actions in so far as self-testing is concerned. The perspective principle states that;

"One environment is more conducive of learning than another if it both permits and facilitates the taking of more perspectives towards whatever is to be learned" (p.585).

The productive principle emphasises the role of deductions and inferences in the effective learning environment. The personalisation principle has two aspects: a responsive environment, permitting discovery and self-pacing, for example, and a reflexive condition which allows feedback to take place.

Parallels exist between the principles of Moore and Anderson(1969) and the learning styles of Kolb. For example, an autotelic environment should enhance the development of accommodative skills and a perspective environment should stimulate divergence. In addition, a productive environment should encourage assimilative skills and the personalisation principle should foster convergent experience.

Kolb and Fry(1975) propose that certain environmental factors influence the development of learning styles and cognitive growth. Each environment is preferable to an individual who manifests a particular learning style: effectively complex environments are characterised by a high degree of personalisation, for example, and are preferred by accommodators; perceptually complex environments reveal opportunities for learners to view subject matter from different perspectives and are preferred by divergers; symbolically complex environments emphasis the recall of concepts and are therefore preferred by assimilators; and finally, behaviourally complex environments encourage learners to be responsible for setting their own learning goals and are preferred by convergers.

It appears, therefore, in reference to the research of Witkin that there is an anomaly in so far as field dependents should learn more effectively from pre-structured information even though they often prefer to be taught by teachers of their own cognitive style who may not provide much structure. Similarly, although it is often suggested that in order to develop an integrated learning style learners must explore environments which do not share the characteristics of their dominant learning style, Kolb and Fry(1975) indicate that this should involve the presence of preferred environmental factors in order to ensure a degree of "psychological safety" (p.56).

From their study into learning style and teaching situations, Kolb and Fry(1975) illustrate the concept of psychological safety; the assimilator least preferred the course in spite of this they did report that some degree of learning had taken place. Indeed, the factors of the course which they listed as helpful included events which required learning behaviour usually associated with their preferred learning style, such as written summaries and opportunities to conform to authority figures. Although these events failed to constitute a substantial part of the instruction, they succeeded in making the assimilator feel "comfortable enough to get something out of the course" (p.56). It is important to note that what appears to have made the assimilator comfortable was similar to what the accommodator least preferred about the course.

Hunt(1974) points out that the goals of the learning process must be considered when matching environments to learning styles. The distinction between what a learner wants, needs or prefers becomes very crucial in any effort to determine and measure environmental factors. The relationship between learner activities and learning styles was studied by Honey and Mumford(1982). They argued that as individuals are dominated by explicit or implicit assumptions about learning styles, the learning activities may be geared to a particular style of learning so as to cause a match or mismatch. They imply that whether the learning style matches the environment is the choice of the learner. Learning environments that operate according to a learning theory that is dissimilar to an individual's preferred style of learning are likely to be rejected or resisted by that learner (Kolb,1981). For example, activists learn best in conditions of new experiences and problems. This is true especially when they are thrown into a difficult task with inadequate resources and facing

adverse conditions. Conversely, they learn least from conditions involving passive solitary learning, for example, listening to lectures, monologues and reading. It is unlikely therefore that activists will respond favourably to a tutorial situation involving passive or subtle coaching.

The implications of these findings are significant not only in the field of experimental learning but also in its wider educational application in the design of learning materials:

"...it might ultimately be possible for individual instruction to allow for different learning styles, as well as different rates of learning" (Entwistle and Hanley, 1977 p.40).

Moreover, as Pask and Scott(1972) state,

"It is less commonly recognised that differences of style have great educational importance because students fare very differently according to whether the teaching materials are or are not adapted to suit their idiosyncrasies" (p.217).

This mismatch of learning styles and learning materials is often cited in the literature: Entwistle and Hanley(1977); Entwistle and Hounsell(1975); Pask and Scott(1972); Hankins(1974); and Entwistle(1981). Pask(1976) from his studies on holist and serialist learning styles and teaching strategies claims that if the teaching strategy is matched to the same type of learning style, students learn more quickly and retain the information longer than they would under conditions of a mismatch.

Rennels(1970) evaluated the effect of teaching styles conceived to follow either a field dependent or a field independent approach. He

found that contrary to expectations, children of both cognitive styles performed better with the synthetic as opposed to the analytical type of training. This raises the question of whether a particular teaching method favours the learning of a particular type of material, irrespective of teacher and student cognitive style.

Grieve and Davis(1971) indicate that the amount of knowledge acquired by students as a result of different teaching methods tends to be related to their cognitive style; the discovery method of teaching increases the knowledge acquisition of field dependent children since interaction with the teacher is an integral part of learning.

Entwistle and Hanley(1977) argue that the deliverers of the instruction are affected by their own dominant learning style. Field dependent instructors tend to adopt informal, unstructured teaching sessions, whereas field independent instructors prefer to employ more structured materials (Wu,1968; Ohnmacht,1967). The existing range of instructional innovations offers a means of achieving learning materials and learning environments that best complement the learning styles of those involved in order to improve learner satisfaction and performance. Entwistle and Hounsell(1975) talk of "viable alternatives to conventional methods" (p.194). One example of such an innovation is the learning circle which involves essentially the generation and exchange of information in an environment supportive of experimentation, reflection, ideas and concepts (Kolb and Fry,1975). Scriven (1985) describes how he used the Honey and Mumford questionnaire on distance learners in conjunction with the learning circle as a means of increasing learner awareness and understanding about their own learning styles. He claims "learners find they have habits of learning which are not conducive to effective self-study,"

(p.344). He also reports that most groups of learners require "quite a push" to persuade them to work outside their established habits of learning. This is particularly important for the application of learning style research to the design and implementation of distance learning materials since the conventional learning environment of classroom instruction is replaced by one removed physically from teacher and peer group interaction.

It is important to point out that the majority of learning style research has been reported from studies involving full-time, internal students. One exception is that conducted by Harper and Kemper (1986) which involved part-time, external, adult learners. They conclude;

"Despite the quite different learning environment of full-time study by lecture and tutorial on a campus and part-time students from learning packages at home, it is justifiable for those in distance education to take cognisance of the pioneering work on learning style researched in the environment of full-time study" (p.219).

6.8 CONCLUSION

It is evident that the work of Jung into psychological types, and later the work of Witkin, is significant in the development of a comprehensive understanding of the role of learning styles in training and education. The Experimental Learning Model and the resultant LSI serve as a theoretical and practical basis for improving learning performance; learners can assess their own predominant learning styles. Clearly, the interaction between the learning style, the task and the learning environment is important in the design of instruction, especially in the choice of learning methods which provide opportunities for learners to improve their own performance and satisfaction. Distance learning is one such learning

method; it offers learners unique learning materials for use in a variety of environmental conditions.

Distance learning is flexible enough to provide learners with either a match or mismatch of style with a particular learning task or learning environment depending upon the objectives of their learning experience. A match ensures a high degree of psychological safety whereas a mismatch encourages learners to develop other learning styles in order to become more efficient and flexible performers.

7.1 THE TOPIC

The first stage of this study involved the researcher in negotiating with the trainers within the company in order to ascertain the most appropriate topic for the distance learning materials. Credit control was selected for the following reasons: 1. There appeared to be a training need due to the absence of up-to-date training literature and the relatively high attrition rate which meant that new trainees were being recruited frequently; 2. The ratio of trainers to trainees was inadequate, resulting in an increased workload for supervisors who were assisting trainers; 3. The bulk of the training was carried out in two central offices which would make data collection accessible; 4. The content of the existing conventional training course was largely knowledge-based; 5. The trainers and supervisors of credit control were willing to co-operate with the study and assist the researcher whenever necessary.

7.2 THE SAMPLE

It was arranged that all new credit control trainees would be assigned either the distance learning materials or conventional training depending upon the workload of the particular trainer or supervisor responsible for their training. It was originally intended to have equal numbers of subjects in each training group. The anticipated total of trainees joining the department during the research period was approximately 180. The bulk of the sample (Group 1), however, was eventually drawn from the general training population of the company comprising trainees on a Youth Training Scheme (YTS) and Graduate trainees due to the suspension of the

recruitment programme in credit control. Of Group 1, 64 were youth trainees and 24 were graduate trainees; the remaining 30 subjects were other employees of Rank Xerox(UK) Ltd. Groups 2 and 3 comprised a total of 28 credit control trainees. (The total sample comprised 146 employees of Rank Xerox(UK) Ltd.) All subjects were employed full-time; the mean number of hours worked per week was 40.2. The length of service with the company ranged from 2 weeks to 10 years. 85 (58.1%) of the sample were women (mean age 25.2 years, range 16-39) and 61 (41.9%) were men (mean age 23.1 years, range 16-28).

7.3 THE TARGET POPULATION

This stage of the study involved investigating the potential population in order to ensure that the materials were designed to suit their learning needs and characteristics. A questionnaire was designed and personally administered to 224 employees of the company currently engaged in some aspect of credit control. The main aim of the questionnaire was to establish the sex, age, educational background, length of service to the company, experience of credit control and previous experience of distance learning of credit controllers. The questionnaire also examined their attitude to training in general and to distance learning in particular. The latter included their willingness to use distance learning materials in the office and at home.

The response rate was 75% (168 subjects). This is due largely to the fact that the majority of the questionnaires were personally distributed and collected.

7.4 DESIGN

An extensive literature search was carried out on the theory and

practice of designing distance learning materials. In addition, the researcher attended training courses on design given by The Open University. Various discussions were also held with members of staff of The Open University who had considerable experience of writing distance learning materials. As a result a series of design recommendations was compiled and applied to the design of the materials used in this study (see Appendix VI for sample text). The choice of medium was subsequently made; print was chosen because the course was essentially knowledge-based and would require regular updating. In addition, print is the common ingredient in the majority of distance learning packages since even more sophisticated forms of media rely on it, for example, to instruct trainees as to the use of the package.

7.5 THE PILOT STUDY

Once the materials had been written but before they were printed, they were tested on six potential trainees and two supervisors. The researcher was present with the pilot subjects as they worked through the materials to record areas of difficulty and misunderstanding as they arose. The results of this stage of the study were incorporated into the design amendments which were added to the materials before their distribution.

7.6 DATA COLLECTION

This stage involved the collection and analysis of the necessary data. The subjective data were gathered using survey techniques including questionnaires, interviews and discussions. A questionnaire was administered before and after subjects had completed the course in order to establish whether a change in attitude concerning distance learning had resulted from the use of the materials. The

pre-package questionnaire (see Appendix VII) examined the personal details of the subjects including age, sex, educational background, experience of distance learning, domestic situation and length of service with the company. In addition, the questionnaire looked at the preferences and concerns of the subjects regarding the use of the learning materials in different environments. The post-questionnaire (see Appendix VIII) concentrated on the subjects' experiences of using the materials and the problems they encountered. It also requested information regarding how long the package had taken and how easy they had found it to use. Questionnaires were administered to all subjects in Group 1 and Group 2.

Structured interviews and unstructured discussions were held at the end of the research period with the subjects in Groups 1 and 2 as well as with their supervisors and trainers. The interviews were conducted on a one-to-one basis and the discussions with a maximum number of six participants, including the researcher. The discussion groups were mutually exclusive consisting of subjects, supervisors or trainers. These survey techniques enabled the researcher to follow-up issues and questions which had arisen from the questionnaire data and the feedback resulting from the telephone contact between the researcher and the subjects during the implementation of the materials.

In order to ascertain the preferred learning styles of individual subjects, the Learning Style Inventory (LSI) of Kolb (1976) was employed (see Appendix V) requiring subjects to rank lists of four words to best describe their method of learning. The scores indicate the preferred learning style. There are four styles: 1, assimilator; 2, converger; 3, accommodator; 4, diverger. The aim of this part of

the study was to establish whether subjects with a particular learning style were more successful on distance learning courses than subjects with other learning styles. A version of the LSI (see Appendix IX), with definitions of the terms used, was designed in order to ensure that all subjects fully understood the instrument. This version was administered to all subjects in conjunction with the original so that subjects could select which of the items to complete.

The objective data were collected using knowledge-based test items, namely a pre-test and post-test (see Appendix X) which were administered before and after the course respectively. This corresponded directly with the information contained in the materials and the objectives of the course.

7.7 IMPLEMENTATION

7.71 Group 1

The subjects were divided into two groups according to their previous experience of credit control. Group 1 consisted of subjects who had never done any credit control before and who were not employed as credit control trainees (n=118). This group consisted of 68 women (mean age 22.6, range 16-33) and 50 men (mean age 21.7, range 16-27).

All subjects (n=146) were contacted by telephone in order to explain about the study, the topic and the objectives of the research. It was made clear to subjects that they were not required to know anything about credit control nor distance learning on commencing the course and that since distance learning was a relatively new form of training it needed to be evaluated in order to ensure that it was appropriate for trainees. It was emphasised that the materials rather

than the performance of individual subjects were being examined. All subjects in Groups 1 and 2 were sent a personal introductory letter thanking them for their support and giving more details of the study. Enclosed with the materials were the pre-package questionnaire, the pre-test and the LSI. The subjects were given instructions as to the completion of the items and were requested to return them by internal mail to the researcher as soon as possible.

Once the completed items had been received, the package was sent to the individual subjects along with a request to notify the researcher on finishing. The date on which the package was sent was recorded in order to monitor the amount of time taken by subjects to complete the materials. Part of the package contained an introduction to distance learning and advice on how to use the materials. At fortnightly intervals a series of reminders was initiated by telephone and also by internal memo. This was continued until the deadline of seven months had passed.

Subjects were sent the post-questionnaire, post-test and instructions by internal mail on completion of the package and requested to return them to the researcher as soon as possible. A letter of appreciation was sent to all subjects, including those who did not complete the course. Telephone contact was made with as many of the non-respondents as possible, as well as follow-up interviews, in order to ascertain the reasons for their decisions to withdraw from the study.

7.72 Group 2

The method of implementation of the materials for Group 2 was the result of discussions which took place between the supervisors,

trainers and the researcher; it was important to ensure that the study would not interfere with the work practises of the credit controllers. Group 2 consisted of credit controllers (n=10; 6 women, mean age 26.8, range 18-39 and 4 men, mean age 25.2, range 19-28) who used the distance learning package. Five subjects in this group received the package as a whole and five subjects were given 2 units at a time by their trainers who arranged for regular meetings to take place in order to discuss the progress and feelings of individual subjects.

The trainers and supervisors maintained contact with the researcher and were asked to keep brief notes on the progress of their subjects so that subsequent discussions could be more fruitful. There was two-way communication between the subjects and the trainers and supervisors throughout the study.

7.73 Group 3

Group 3, the control group, also consisted of credit controllers; 18 subjects (11 women, mean age 25.1, range 19-36 and 7 men, mean age 26.3, range 18-27) who used the conventional training methods. These involved a theoretical introduction to credit control in a classroom with a trainer. The class comprises 2-6 trainees and lasts for 3 days. A practical introduction follows the theoretical work and exposes the trainees to the journals, systems and files involved in credit control. This stage of the training usually lasts for 2 days. Trainees then take on the responsibilities of a credit controller; they are expected to learn as they carry out the duties. Consequently, the bulk of the learning takes place in the workplace with trainees asking their colleagues or supervisors for clarification whenever a problem arises. This training arrangement is

largely the result of the necessity to maintain an adequate number of credit controllers thereby ensuring that debt is monitored and collected efficiently.

The trainers administered the pre-test at the onset of their training and the post-test one month later. This period was selected because in the company credit control is conducted over a 28 day cycle; it was anticipated that within this period all subjects would have received their face-to-face training in full and would also have been exposed to the majority of activities.

7.8 EVALUATION

This stage involved analysing the data collected. The pre-test measured the knowledge level of subjects on commencing the course whilst the post-test measured the level on completing the course. Any difference in the scores of individual subjects on these tests indicated the extent of the learning. The test data were analysed using non-parametric tests for unequal ns, such as the Kruskal Wallis Test, the Mann-Whitney U Test and the Chi Square Test. The influence of the sex, learning style, previous experience of distance learning and educational background on the scores achieved by subjects was examined; these factors are reported in the literature as effecting the performance of distance learners. The scores of the credit controllers in Groups 2 and 3 were analysed to establish whether there was a significant difference as a result of the experimental conditons. The subjective data were also analysed according to the experiences of the subjects, trainers and the supervisors involved in the system.

Although the pre-package questionnaire, the post-questionnaire and

the LSI were administered to Groups 2(n=10) and 3(n=18), the number of subjects in each group was only considered large enough to warrant separate treatment in instances where their findings were different from those of Group 1. The subjective findings from the questionnaires and the LSI are examined in conjunction with those of Group 1 as part of the overall results; only the objective data of each group from the pre- and post-tests are examined independently.

8.1 RESPONSE RATE

The response rate was computed according to the number of subjects required to complete the distance learning package, namely 118 (108 non-credit controllers from Group 1 and 10 credit controllers from Group 2) since Group 3 used conventional training methods. There were 61 respondents; the response rate for the Group 1 was 44% (n=51) and 100% (n=10) for Group 2. The mean age of the respondents was 20.7 years, the range was 16-39. Of the respondents, 34 were women (55%) and 27 (45%) were men.

All respondents completed the entire package and each of the accompanying items. The turn-around time for the pre-package questionnaire, pre-test and LSI for the Group 1 ranged from 5-84 days (mean 22.1, sd 16.68). Groups 2 and 3 returned these completed items to their supervisors on the same day as receiving them. Group 1 completed the package within a range of 12-102 days (mean 63.8, sd 30.6). Group 2 had a range of 1-42 days (mean 15.2, sd 12.9). The turn-around time for the mailed post-questionnaire and the post-test (Group 1) ranged from 4-54 days (mean 20.5, sd 17.8), whereas Group 2 returned these items within 2 days.

8.2 SUBJECTIVE RESULTS

A section of the pre-package questionnaire was concerned with the characteristics of the subjects. The characteristics selected were believed from the literature to have an influence on the performance and attitude of subjects regarding distance learning.

The domestic situation of the respondents (n=128) was established; 6

respondents (5%) lived alone, the remaining 122 respondents (95%) lived with at least one other person (mean 3.9 people, range 1-8, sd 1.32). 39 of the latter respondents (32%, n=122) lived with children (aged under 16 years) ranging from 1-3 children (mean age 10.38 years).

The educational background of the respondents was also investigated. The maximum period that any respondent had spent since completing training or full-time education was 20 months (mean 8 months). The findings are shown below: (n=128)

Highest qualification	frequency	(%) of respondents
Post-graduate	8	(6)
Graduate	29	(23)
A Level	4	(3)
B. Tech.	32	(25)
O Level	13	(10)
CSE	38	(30)
None	4	(3)

The educational levels were grouped for the purposes of subsequent statistical analysis. The completion rates (% of subjects completing the course from this educational level in group 1) are shown below: (n=51)

	n	(%)
Post-graduate and graduate	19	(51.0)
A Level and B. Tech.	16	(44.0)
O Level and CSE	15	(29.3)
None	1	(25.0)

The Chi Square Test confirmed that completion rate was not independent of educational background at the .01 level ($X^2 = 15.0$, $df3$). The results indicate that those subjects with an educational background involving at least a BSc or equivalent had a greater likelihood of completing the course than those subjects of lower educational levels. Indeed, the higher the level of education reached, the higher the response rate achieved on these distance learning materials.

8.21 Previous experience of distance learning

The subjects were given a brief written description of distance learning before being asked *"Have you ever been on a course involving distance learning materials?"* 21 respondents (17%, $n=128$) replied positively; the remaining 127 (83%) respondents replied negatively. Of those replying positively, 12 (57%) indicated that the course had been undertaken for the sake of *"professional qualification"*; the remaining 9 respondents (43%) cited *"personal interest"* as the reason.

An equal number of respondents had studied their distance learning materials at home as had at work. 3 respondents (14%) stated that they had combined the two environments. Respondents were asked their opinion of their previous distance learning course in terms of how *"interesting"*, *"easy"* and *"enjoyable"* it had been. Responses were made on a five point scale ranging from *"very boring"* (1) to *"very interesting"* (5), *"very easy"* (1) to *"very difficult"* (5) and *"very enjoyable"* (1) to *"not at all enjoyable"* (5). The most frequent response was the mid-point (3) for the questions of interest and difficulty. The question regarding how enjoyable the course had been yielded a different result: 12 respondents (57%) found the

course to have been *"not at all enjoyable"*. In reference to the question of time allowance, the respondents indicated that they had had too little rather than too much time to complete the course, although the mid-point choice (3) was the most popular.

15 respondents (71%) completed the course. Those not completing cited reasons connected to their domestic situation, for example *"I had too many conflicting responsibilities at home"*. Other reasons included *"loss of interest"* and *"insufficient time"*.

Respondents were required to list the two greatest advantages and the two greatest disadvantages of distance learning based on their own experience. The most frequently cited advantage was that of convenience in that the learner was able to select to some extent where and when to study. The second advantage was concerned with the benefits of studying in one's own spare time, thereby avoiding unnecessary absence from work. The most cited disadvantage was that of overcoming boredom and the second disadvantage related to the time-consuming nature of the materials.

Those subjects with previous experience of distance learning had a higher completion rate than those without previous experience; the overall completion rate for those with experience was 71% (n=15), the completion rate for those without experience was 58% (n=98).

8.22 Learning styles

Each respondent was assigned the appropriate learning style (Kolb, 1975). Of the original respondents (n=128) 40 were accommodators, 17 divergers, 55 convergers and 16 assimilators. Of these, 21 accommodators (53%), 1 diverger (6%), 36 convergers (65%) and 3 assimilators (20%) completed the course.

This indicates that the completion rate for divergers was the lowest amongst the learning styles whereas the convergers had the highest completion rate. The convergers and the accommodators increased their shares of the total subject population. The frequencies for the original sample (n=128) and the respondents (n=61) are shown below:

Learning Style	Sample		Respondents	
	Frequency	%	Frequency	%
ACCOMMODATOR	40	31	21	35
DIVERGER	17	14	1	2
CONVERGER	55	43	36	58
ASSIMILATOR	16	12	3	5

8.3 ATTITUDES TO DISTANCE LEARNING

A section of the pre-package questionnaire was concerned with how the subjects viewed the possibility of using distance learning materials as part of their in-house training. This served as an indicator of the respondent's motivation. The responses were made on a five-point scale ranging from *"very keen"*(1) to *"not at all keen"*(5), (n=128).

<i>"very keen"</i>	1	2	3	4	5	<i>"not at all keen"</i>
Frequency	33	54	19	15	7	
(%)	(26)	(42)	(15)	(12)	(5)	

The influence of the learning style on the attitude of the subjects (n=128) was considered. The mean ranks on the five-point scale were accommodator (2.20), diverger (2.48), converger (1.42) and assimilator (2.28). These results indicate that respondents with the converger learning style were most highly motivated, followed by the accommodator, then the assimilator and finally the diverger who revealed the lowest motivational level.

8.31 Study Schedule

The subjects (n=128) were also asked *"How many hours of your spare time would you be willing (and able) to devote to studying each week"*? The results are shown in Appendix XIa. The subjects (n=128) were also required to indicate when they would be prepared to study. The results are shown in Appendix XIb. They were then asked at what time would they study, see Appendix XIc.

The results suggest that the majority (78%) of subjects were prepared to spend a maximum of 10 hours of their spare time each week studying. Of the subjects, 59% considered 5-10 hours per week to be the most convenient period. 71% of subjects would prefer to study in the evenings (between 5-10pm) during the week rather than at the weekend.

8.32 Anticipated study environment

The subjects (n=128) were asked *"Suppose you could choose where to study to enable you to learn most efficiently according to your own circumstances, where would you study?"* The respondents replied in reference to their spare and their work time and the results are shown in Appendix XId. The findings support the willingness for subjects to study at home during their spare time.

The respondents were also required to indicate on a five-point scale how they would feel about using distance learning materials *at home in their spare time*. The results are shown below: (n=128)

	<i>"very unhappy"</i>			<i>"very happy"</i>	
	1	2	3	4	5
Frequency	6	32	32	41	17
%	5	25	25	32	13

In addition, subjects (n=128) were asked how concerned they would be about various factors whilst studying at home; the results are shown in Appendix XIe. These results indicate that subjects would feel happy about studying at home in their spare time. However, whilst 27% of subjects would not be concerned (ranking 4 or 5) about noise, 54% indicated that they would be (rankings 1 or 2) consequently, there is a 23% leaning towards a feeling of concern about this factor when studying during spare time at home. Similarly there is a 15% leaning towards concern about interruptions.

Subjects (n=128) were asked how they would feel about studying *at home during work time*:

	<i>"very unhappy"</i>			<i>"very happy"</i>	
	1	2	3	4	5
Frequency	3	12	29	56	28
%	2	9	23	44	22

The findings above indicate that the subjects would be happy to study at home during work time. They were also asked how concerned they would be about various factors and the results are shown in Appendix XIIf. These results reinforce the subjects' willingness to study at home during work time; there was a leaning towards subjects being unconcerned about noise (12%) and domestic responsibilities (23%). There was, however, a leaning towards concern about facilities (13%).

Subjects (n=128) were asked how they would feel about studying at work during work time:

	<i>"very unhappy"</i>			<i>"very happy"</i>	
	1	2	3	4	5
Frequency	17	18	33	50	10
%	13	14	26	39	8

In addition, they (n=128) were asked how concerned they would be in this environment about various factors. The results are shown in Appendix XIg. Although the subjects indicate that they would be generally happy about studying at work during work time, there is clearly a leaning towards a feeling of concern about noise (38%), interruptions (34%) and professional responsibilities (31%). Subjects would, nevertheless, not be concerned about their domestic responsibilities in this environment (leaning of 37%).

The attitude of individual respondents to using distance learning materials in a particular environment was examined from the point of view of learning style. First, the responses to the question regarding studying in their spare time (see Appendix XIh) and second, those concerned with studying during work time were recorded (see Appendix XIi). Whilst all learning styles prefer to study at home in their spare time, the accommodators do not wish to study in the office and the assimilators do not wish to study in an educational institution. As a percentage, more convergers indicated that they preferred to study in the office (27%) than any other learning style and the accommodators had the highest percentage preferring to study in an educational institution (20%).

The results, however, show more variation between learning styles when subjects are asked their preference for study environments during work time; the accommodators (55%) and the assimilators (56%) still preferred to study at home whereas the divergers were divided equally (37%) between home and an educational institution. Indeed, the divergers had the highest percentage of subjects preferring to study in an educational institution; the assimilators had the lowest percentage (0%). The convergers had the highest preference for studying at the office during both spare (27%) and work (60%) time.

8.33 Actual study environment

A section of the post-questionnaire was devoted to discovering first, what kind of environment the respondents studied in, and second their attitude to the learning environment. 48 of the respondents (79%, n=61) studied the entire package in the same environment. The environments selected by the respondents are shown below:

Environment	Frequency	%
At home	19	31
At work in the office	14	23
At work in a study room	15	25
At home and in the office	13	21

Those who chose to study *at home* (n=31) were required to indicate how they had felt about various factors (see Appendix XIj). The results indicate that there was a leaning towards the subjects feeling unconcerned about noise (52%), interruptions (52%), their domestic (36%) and professional (38%) responsibilities as well as facilities (38%).

Those who chose to study *at work in the office* (n=27) were asked how they had felt about various factors; the results are shown in Appendix XIk. Subjects demonstrated a leaning towards feeling concern about noise (41%) and interruptions (55%) when they worked in the office, although they had a leaning towards feeling unconcerned about facilities (23%).

Those who studied *at work in a study room* (n=15) were also asked how they had felt about various factors (see Appendix XII). Subjects revealed a leaning towards feeling concern only for their professional responsibilities (32%). All other factors resulted in a considerable leaning towards unconcern especially regarding noise (93%), interruptions (93%) and domestic responsibilities (93%).

8.34 Post-package attitudes to distance learning

A section of the post-package questionnaire was devoted to discovering the opinions of the respondents regarding distance learning on the basis of their experiences with the package. The respondents indicated on a five-point scale how they would feel about being trained by distance learning in the future: (n=61)

	<i>"very happy"</i>			<i>"not at all happy"</i>	
	1	2	3	4	5
Frequency	14	13	11	18	5
%	23	21	18	30	8

It appears therefore that there is a slight leaning (3%) towards the subjects feeling happy about being trained by distance education in the future.

The respondents (n=61) were also required to list the two most important advantages of this kind of training. The results are similar to those reported by previous researchers into distance learners. The advantages included convenience, for example, *"Being able to study in your spare time"* (19 respondents; 31%) and *"Being able to study where you like"*, (5 respondents; 8%). This was the most frequently expressed advantage. Other advantages were self-pacing, for example, *"Being able to work at your own pace"* (22 respondents; 36%) and presentation, for example, *"The format's easy to understand and easy to revise from"*, (10 respondents; 16%).

The most striking disadvantage according to the respondents was loneliness, for example, *"There's no one to explain things"*, (20 respondents; 32.7%) and *"There're no colleagues to discuss it with"*, (12 respondents; 19.7%). Other disadvantages included time, for example, *"There's not enough time or any special time set aside"*, (19 respondents; 31.1%) and motivation, for example, *"There's no incentive therefore enthusiasm is low"*, (10 respondents; 16.4%).

The findings from this section of the post-package questionnaire served to indicate areas for further discussion during the subsequent group interviews with the subjects, their supervisors and trainers.

8.35 The package

The respondents (n=61) were required to indicate on a five-point scale how they viewed the package along the dimensions of interest, ease, enjoyment and convenience. The results are shown in Appendix XI. The majority of the subjects selected the middle ranking (3) to describe how they considered the package in terms of interest and

ease of use. There was a slight leaning towards a negative attitude in terms of enjoyment and convenience of use.

The presentation and format of the package was investigated in a similar way. The characteristics of size, coherence, accessibility and appearance were considered and the results are shown in Appendix XIn. The subjects had a generally positive attitude to the presentation and format of the package; there was a leaning towards the feeling that it was easy to follow (30%) and easy to dip into (6%).

In reference to the question of difficulty, 40 respondents (66%, n=61) considered the units to be equal. When asked to rank the units in order of difficulty, the remaining respondents found Unit 6 to be the most difficult, followed by Unit 5 and then Unit 8. Unit 1 was regarded as the least difficult, followed by Unit 2 and then Unit 3. 37 respondents (61%, n=61) believed the units to be of equal length. According to the other 24 respondents, Unit 5 was the longest unit, followed by Unit 6 and then Unit 8. The shortest unit was considered to be Unit 1.

8.4 INTERVIEWS AND DISCUSSIONS

8.4.1 Non-credit controllers

The information gathered through the interview and discussion techniques reinforced the findings of the questionnaires. The overall opinion was that the method of learning was *"refreshing and enjoyable"*;

"I really liked using the package, it was a nice change from face-to-face classes we attend usually" (graduate trainee).

Moreover, many subjects expressed an interest in using distance learning again as part of their training programme. The main concern of the non-credit controller was the content of the package, as one youth trainee pointed out,

"It's hard to get to grips with a topic you suspect you're never going to have a use for. It's also a quite technical subject which makes concentration even more difficult".

This feeling was echoed in the discussion groups. Nevertheless, they were optimistic that if the package was related to their own subject it would be easier to apply what was learned to the work situation.

In reference to the format of the package, some of the subjects would have preferred more instructions regarding how to use the different features. For example, one subject was unsure whether she was supposed to be able to answer the self assessment questions without referring back to the text and another was similarly unsure of the function of the objectives.

"Am I supposed to be able to perform the objectives without the help of the relevant sections"? (youth trainee).

Another comment made was:

"The objectives, summary, questions and answers all seemed to be saying the same thing. This is okay for implanting it in some peoples' minds - but for me it meant that I got bored, lost patience and skipped chunks" (graduate trainee).

Despite these remarks, the presentation of the package was well-received; the ring-binder was cited as useful in so far as additional notes and comments could be included easily and the order of the package could be altered to suit the requirements of the subject. Several subjects indicated that they had carried the package around with them whenever they anticipated having a few spare minutes; they considered the ease with which they were able to dip into the package to be one of the greatest advantages.

It was in reference to the style of the package that the majority of the grievances were demonstrated. One student found the style to be "*patronising in its simplicity*". The other subjects who complained thought it become less apparent as they progressed through the package;

"To start with the chatty style was a little irritating but once I became engrossed in the package it seemed less patronising and more friendly. I suppose it's just a question of getting used to it" (graduate trainee).

It is important to emphasise that the majority of the subjects interviewed found the style to be friendly and informal. Indeed some believed it to be the most significant contributor to their success on the programme.

8.42 Credit controllers

The credit controllers interviewed were more concerned with the content of the package rather than its presentation. The need to update the material was very apparent;

"Much of the package is out of date, especially the unit on the standard collection cycle" (credit controller trainee).

The credit controllers also criticised the style of the package in so far as they believed it assumed that they were unfamiliar with credit control whereas some of the subjects had been exposed to this topic whilst working in other departments, customer liaison for example. Three of the subjects expressed a dislike for the section on journals claiming that it was too complicated to be taught by distance learning. One subject illustrated this by stating that on completing the section she still could not fill in a journal correctly. The two other subjects indicated that their enthusiasm for the package first waned on encountering difficulties with this section. One subject confessed

"At that moment the package went into my drawer and was forgotten about".

Despite these criticisms the package was on the whole regarded as "a huge improvement" on the other training literature they have received both in this company and in their previous company.

"I found it an excellent way of being trained. I could use the package whenever I felt as though I needed to and I could spend as long as I wanted to on it. I particularly enjoyed "studying" in the workplace; this meant that I was picking up additional information just by listening to the work chatter in the office," (credit controller trainee).

Not all the subjects interviewed were able to use the package successfully in the office;

"I need to be in a quiet atmosphere without any interruptions and preferably by myself, I found it difficult to absorb the information under any other conditions. Consequently, I used the package at home in the evenings and although it infringed on my domestic responsibilities a little it was worth it because I was able to take in the information so much more easily," (credit controller trainee).

Other subjects did not study in the office because of the telephone interruptions and other common disturbances. These subjects preferred to use the package in their own time at home. One subject was reluctant to do this because she considered it the responsibility of the company to train them in their time or else to pay overtime allowances to trainees studying in their own time. Those preferring to study in the office often did so because the conditions at home were less conducive to study than they were at work:

"For me it's the lesser of two evils, neither is ideal but at least at work I know the children are being kept out of mischief at school", (credit control trainee).

In reference to the administration of the package, of the subjects given the package in batches of units, nine subjects considered it to be the best method since they did not feel overwhelmed by the sight of the whole package which is rather large compared to conventional training manuals. They claimed it was easier to concentrate on one topic and understand it completely before being exposed to another topic.

One subject revealed:

"I felt really good on finishing a unit especially as I put them into my credit control ring binder that seemed to grow and grow!" (credit control trainee).

The third of the subjects not enjoying the method of administration did not like the idea of reporting back to the trainer at regular intervals;

"...although it made you get on with it it was invariably at the last minute just before you went in to see the trainer so I wasn't really using it to my full advantage. I would have preferred to have the complete package so that I could dip into it whenever I wanted to" (credit control trainee).

Those credit controllers given the whole package liked it because it gave them an insight into the kind of terminology and problems they might encounter as they progressed in credit control. They did however admit that the bulk of the package was initially offputting and it did seem more daunting than it really was once they were involved in credit control. More than half of the subjects would have preferred a regular meeting with the trainer in order to discuss any difficulties because they found that their supervisors were more interested in the practical side of credit control than the package. They said they found it useful that other credit controllers were involved in the programme so that they could discuss the package together.

8.43 Trainers and supervisors

The interviews with the supervisors and the trainers of credit controllers established another perspective on the use of the package. Initially they recognised the contribution to training that the package had made; the package has been implemented as the chief training source for credit controllers since its experimental stage.

"We've used the package for the student intake as well as the usual intake of credit controllers from other companies and from other departments from within this company. There is quite a high attrition rate here so you don't always notice just how important the package is" (trainer).

The trainers and the supervisors indicated that the problem of updating was real for them particularly in light of the recent major changes to the way in which credit control is organised in the company. They revealed that they did not have the time to update the material and they could foresee this aspect of the package being a major stumbling block in the future.

"This is not a problem peculiar to distance learning because we've experienced the same thing with our training manuals, there just aren't the staff free to dedicate a great deal of time to updating this topic which is currently very fluid. We've tried to do it ourselves but we're too thinly spread anyway. The supervisors have tried but they're too busy managing their credit controllers. We've even tried letting the students update their own manuals but it just isn't feasible" (credit control trainer).

They expressed some apprehensions regarding distance learning as a

method of training credit control;

"I find it difficult to entrust the training of the new intake to methods of training that don't involve face-to-face demonstrations and guidance," (supervisor).

This sentiment was true particularly of the journals section although they did concede that it was a reflection of the organisation of their journals rather than the relevance of distance learning.

The trainers envisaged a problem of motivation if the trainees were supposed to take the material home to work through in their own time or if they were required to do it in conjunction with credit control activities in the workplace. The collection of debt and account management is subject to pressures at certain times of the collection cycle, at month end, for example, when the targets for that month must be met. The priority of the trainee and the supervisor is to meet the targets, not to complete the training package, and as a result the distance learning is pushed aside until the workload lessens. This serves to decrease the incentive to learn from the package and as one supervisor pointed out:

"The longer the package is ignored the less beneficial it is to the trainee when it is eventually consulted".

They considered the package to be most suited to the needs of the person new to credit control and not just the company. They proposed that an effective means of implementation might be to provide the trainees with a study room for certain periods so that they can learn away from interruptions but near to the systems necessary to perform

certain credit control functions and near to their supervisors and trainers should they feel in need of extra advice. However they agreed that this still involved an increase in the responsibility of the supervisor who would need to allocate rooms and provide on-the-spot assistance.

From the point of view of the supervisors, the administration of the package was most convenient when it involved giving the subjects it as an entity because it resulted in fewer monitoring responsibilities. Those supervisors and trainers who had arranged for regular progress meetings with the subjects had similar feedback to discuss, namely the increasing difficulty they experienced in chasing up the subjects in the first instance and second, the increased resistance to the request for them to complete the package.

The majority of those interviewed expressed a desire to *"build on their experiences of distance learning rather than to remove it all together"* (trainer).

8.5 OBJECTIVE RESULTS

8.51 Scores

The scores on the pre-tests from the original sample (n=146) ranged from 0-43, the maximum score possible was 66. Group 1 had a range of 0-31; the credit controllers (Groups 2 and 3) had a range of 7-43.

The results are tabulated below:

Subjects	Mean	sd	Respondents	Mean	sd
Group 1 (n=118)	5.72	6.69	(n=10)	6.14	6.9
Group 2 (n=10)	24.6	12.9	(n=10)	24.6	12.9
Group 3 (n=18)	25.1	14.1	(n=18)	25.1	14.1

The hypothesis that the score on the pre-test influences whether subjects go on to complete the package was investigated. The pre-test scores for Group 1 were considered and the Mann-Whitney U Test found there to be no difference between the pre-test scores of respondents (n=51) and non-respondents (n=67), ($U=292$, $p>0.5$).

The mean score on the post-tests (n=61) was 39.5 (sd 17.48) for Group 1 and 50.8 (sd 5.9) for credit controllers in Groups 2 and 3. Group 2 had a mean score of 51.5 (sd 5.98) and Group 3 had a mean score of 43 (sd 7.02).

The "gain" score was computed by subtracting the pre-test score from the post-test score. The mean gain score for Group 1 was 35.8 (sd 15.2). The mean gain for Group 2 was 24 (sd 14.1) and Group 3 had a mean score of 14.5 (sd 6.9).

In order to examine the influence of the experimental conditions, the gain scores of Group 2 (n=10) and Group 3 (n=18) were tested for significance using the Mann-Whitney U Test. (Group 1 was not included because it consisted of non-credit controllers whose knowledge level of credit control on commencing the package was much lower than that of Groups 2 and 3). There was a significant difference between Groups 2 and 3 at the .001 level ($U'=2.5$).

8.52 Learning style and score

The mean gain score and the learning style of respondents is shown overleaf: (n=61)

		Mean gain score	sd
ACCOMMODATOR	(n=22)	7.6	13.9
DIVERGER	(n=1)	11	NA
CONVERGER	(n=36)	40.2	13.7
ASSIMILATOR	(n=3)	16.3	11.5

The size of each learning style sample was too small to enable the groups to be treated separately consequently the 3 styles, excluding diverger, were examined using the Kruskal Wallis test. A significant difference was found between the groups at the .001 level ($H=27.8$, $df=2$). The Mann-Whitney U Test found a significant difference between the converger and other styles, including diverger, at the .01 level ($U'=184.5$).

8.53 Sex and score

The mean gain score for women was 34.5 (sd 19.93, $n=34$) whilst the mean gain score for men was 32.4 (sd 18.39, $n=27$). There was no significant difference according to the Mann-Whitney U Test ($U'=46$, $p>0.5$).

8.54 Environment and score

The influence of the environment was also considered on the scores achieved by Group 1 ($n=51$). (Group 2 was not included because the way in which the materials were implemented frequently required this group to study at work rather than offering the choice of environments).

Environment	Mean Score	sd
Home only	(n=9) 49.2	6.9
Office only	(n=16) 31.9	18.6
Office study room only	(n=11) 33	11.8
Home and office	(n=15) 35.3	13.7

For Group 1, the Kruskal Wallis Test indicated that there was a significant difference between the 4 environments at the .01 level ($H=11.3$, $df3$). A further statistical comparison of the home environment and the office environment was significant at the .01 level ($U=26$). A comparison of home versus the study room was significant at the .01 level ($U=17$) and home versus the combination of home and office was also significant at the .01 level ($U=23.2$). This indicates that the subjects studying at home scored significantly higher than subjects studying in other environments, including a combination.

8.55 Educational background and score

The educational background and the gain score achieved by respondents was examined. Due to the small size of the sample, the respondents with no recognised academic qualifications were considered in the same sample as those with CSE and O levels. Using the Kruskal Wallis Test no significant difference between the groups was obtained ($H=3.2$, $df2$). The mean gain scores for the different groups were as follows:

None/CSE/O Level	(n=20)	31.4	(sd 17.9)
A level/B Tech	(n=19)	38.5	(sd 13.6)
BSc/Postgrad	(n=22)	33.1	(sd 15.0)

8.56 Previous distance learning experience and score

The gain scores were compared according to whether respondents in each of the educational groups had any previous experience of distance learning as indicated in the pre-package questionnaire. The Mann-Whitney U Test found the respondents with distance learning experience to score significantly higher in each educational group:

	With experience	Without experience		Significance level
None/CSE/O Level	(n=5)	(n=15)	U=13.5	.025
A Level/B Tech	(n=7)	(n=12)	U= 5.5	.001
BSC/Postgrad	(n=3)	(n=19)	U= 5	.025

8.57 Motivation and score

The mean gain scores obtained were examined according to the motivation of the respondents. The motivation of the respondents in Group 1 (non-credit controllers) was considered separately and measured according to their keenness to study using distance learning as indicated in the pre-package questionnaire.

Motivational level	Subjects (n)	Respondents (n)	Completion rate	Mean score	sd
1(High)	28	20	71%	42.2	11.1
2	52	15	29%	33.6	18.2
3	18	11	61%	31.2	16.8
4	14	5	36%	21.2	6.4
5(Low)	6	-	0%	-	-

The Kruskal Wallis Test found a significant difference between the scores obtained at the .001 level ($H=17.06$, $df\ 3$). The Mann-Whitney U

Test found there to be a significant difference at the .001 level between motivational levels 1 (n=20) and 2 (n=15) ($U'=50.5$). There was no significant difference between levels 2 (n=15) and 3 (n=11) ($U'=56.5$). There was a significant difference between levels 1 (n=20) and 4 (n=4) at the .05 level ($U'=17$) and at the level .05 between motivational levels 2 (n=15) and 4 (n=4) ($U'=17.5$). Clearly, an increase in motivation beyond level 3 results in improved scores for subjects.

8.6 Times

8.61 Times for completion of the package

The time taken to complete the package ranged from 2-48 hours (mean time 8.2, sd 9.4). 43 respondents (70%; n=61) indicated that they would have preferred to have had more time available. 58 respondents (95%) approached the package in the order presented; the remaining respondents selected their own order.

8.62 Learning styles and time taken

The influence of learning style on the completion time and turn-around time for respondents in Group 1 is shown below: (n=51)

	Mean (hours) to complete package	Mean (days) turn-around time
ACCOMMODATOR	7.35 (sd 9.5)	59.1 (sd 31.59)
DIVERGER	3 (sd -)	30 (sd -)
CONVERGER	9.4 (sd 5.0)	54.1 (sd 29.9)
ASSIMILATOR	10 (sd 4.5)	36.6 (sd 13.3)

There was no significant difference between convergers and others

regarding the time taken (hours) to complete the package
(Mann-Whitney U-Test: $U'=152$, $p>0.5$).

8.63 Times for the completion of the tests

The mean time taken (minutes) by the subjects to complete the pre-test is shown below:

	Group 1	Group 2
Original sample(n=146)	30.4 (sd 29.1)	33.9 (sd 20.5)
Respondents(n=61)	27.9 (sd 21.5)	
Non-respondents(n=85)	37.2 (sd 41.1)	
Control group(n=18)	35.8 (sd 13.5)	

The mean time (minutes) taken to complete the post-test was 89.1 minutes (sd 40.6) for Group 1. Group 2 had a mean time of 44.8 minutes (sd 27.2) and Group 3 had a mean time of 40.2 minutes (sd 26.5). A statistical test was carried out on the combined times for subjects to complete the pre- and post-tests and their gain scores. There was no significant difference (Mann-Whitney U Test; ($U'=566.5$, $p>0.5$) between the time taken by credit controllers in Groups 2 and 3 ($n=28$) and non-credit controllers in Group 1 ($n=51$).

8.64 Time and score

The Spearman rank test found no significant correlation ($Rho=0.21$, $p>0.5$) between the time taken to complete the tests and the score achieved.

8.7 CONCLUSION

The results section is concerned with the influence of several factors on the completion rate and score achieved by subjects using distance learning or conventional training methods. The educational

background of subjects was found to have a positive influence on the completion rate; those students of a higher academic level were more likely to complete the course than those of lower academic levels. The score achieved was also positively influenced by the educational background of subjects. Those subjects with previous experience of distance learning were more likely to complete the course and to achieve a high score than those with no previous experience. The learning style of subjects was found to have a significant influence on completion rate and the score achieved: convergers, for example, had the highest completion rate and obtained the highest score whereas the lowest completion rate and the lowest scores were achieved by the divergers. The environment in which subjects used the materials had a significant influence on the performance in terms of the score obtained; the highest scores were achieved by those subjects studying at home.

The motivation of distance learning students is reported to be an important factor in determining the success of the learning programme. The results of this investigation reinforce this theory with students of higher motivational levels achieving better scores than those of lower motivational levels. The results also indicate the difference in scores achieved by students using the distance learning materials compared to those using conventional training methods; the highest mean gain score was obtained by students using the materials.

Credit controllers in the control group (Group 3) had a lower score than those credit controllers using the materials (Group 2) even though the mean pre-test scores were very similar. Finally, interviews carried out with credit controllers and supervisors using

the materials as well as those using conventional training methods provided further insights into the role and success of distance learning in the business setting.

9.1 THE SAMPLE

The sample used in this study was intended to be representative of the credit control trainee and general trainee population of the company at the time of the research. It is, however, important to question to what extent the sample reflected the characteristics of the actual credit control population for whom the materials were written. A detailed survey using questionnaires was conducted on the credit control population (n=224) during the design stage of the research in order to establish the main characteristics of the potential learners. The population was predominately female, the mean age was 35.2 years and the subjects worked full time (mean 43.1 hours per week). Of the population, 10% had previous experience of distance learning. The educational background of the subjects ranged from O level to A level and B.Tech. None of the subjects lived alone; more than 90% lived with children aged under 16 years. 35% of the population had experience of credit control before joining this department of the company.

The distance learning materials were, therefore, designed to suit the characteristics of this population. For example, the terminology and language used was aimed at learners with at least O levels and a comprehensive introduction to distance learning was included. Unfortunately, due to problems associated with the revised intake of credit controllers into the company during the period of research, the actual sample for the study was not drawn primarily from the credit control trainee population but from the general trainee population comprised of YTS and Graduate trainees.

The fact that the intake of new credit controllers was to be at least temporarily suspended was not made apparent to the researcher until after the package had been written so there was no time in the research schedule for amending either the style or the content of the package. Another result of this unfortunate decision was that the motivation of the sample was considerably lower than had been anticipated because the topic of the materials was not related to any of the training programmes currently being undertaken by the sample.

The sample used in this research comprised approximately equal percentages of male (42% of the original sample, 45% of respondents) and female subjects (58% of the original sample, 55% of respondents). The sample was also younger than the actual population by over 10 years for subjects in the original sample and nearly 15 years for respondents who completed the course. Although the educational background was slightly different, the main difference between the two populations was the awareness of the sample concerning credit control; the materials were written on the assumption that the learner had at least a fundamental understanding of what the term "credit control" involved.

It is ironic that one of the reasons originally put forward by the company for selecting the topic of credit control was that there was a need for the existing training to be revised and updated. Perhaps another topic would have enabled the researcher to draw on a more accurate learner population for the sample. Nevertheless, the significance of the research remains. The role of distance learning is examined from the viewpoint of credit controllers who have a need and desire to complete the package as part of their training, as well as from the viewpoint of less

motivated trainees whose performance and attitudes.

9.2 SCORES

9.21 Pre-tests

The pre-test was designed and administered in order to establish the knowledge levels of subjects on commencing the course. It is important to point out that the pre-test examined credit control in a particular company rather than as a general topic; some subjects with previous experience of credit control were disturbed at how difficult they had found the test.

The maximum score achievable was 66; the maximum score obtained by Group 1 was 31. This appears to be high for trainees whose field was something other than credit control. However, the mean for this group was 5.7 which is a more accurate indication of the starting knowledge level of this group since many subjects were unfamiliar with the term "credit control". The mean score for Group 1 was 24.6 and 25.1 for Group 2. The similarity in scores indicates that the starting knowledge levels between these groups were not appreciably different. This is essential in order to ensure that any differences in performance were the result of the experimental conditions rather than other factors. A difference in pre-test scores between the non-credit controllers and the credit controllers was anticipated due to the likely exposure of the latter to pertinent information before the commencement of the course. It is, however, necessary to calculate the gain scores in order to obtain a more realistic understanding of the performance of subjects.

9.22 Gain score

The gain score of subjects indicates the improvement in credit

control knowledge achieved between the beginning and the end of the course. It is important to point out that the pre- and post-tests were designed in order to test the comprehension of subjects concerning the information contained in the package.

Group 1 had the highest gain score (35.8). The performance of non-credit control trainees surpassed that of the credit controllers. It is relevant that the starting knowledge level of Group 1 was much lower than those of the other groups. There was, therefore, more scope for improvement. However, the credit control groups did not achieve maximum scores on the post-test indicating that they had not fully understood and retained the information contained in the package.

There was a significant difference between the gain scores of Group 1 and Group 2; the former was significantly greater. Group 2 were administered the package as part of their credit control training; they were expected to study the package and to carry out fundamental credit control duties at the same time. It was anticipated that this group would, therefore, score more highly given the fact that they were working as by credit controllers whilst using the package.

It is important, therefore, to question whether the pre- and post-test were actually examining information which was pertinent to the conduct of credit control. First, the package was essentially knowledge-based; it only introduced skills where appropriate and did not attempt to train subjects as to how to carry them out. This was a shortcoming in so far as much of the credit control contained in the materials was concerned with the application of skills, such as telephoning bad payers in order to collect debt. The package

indicated how bad payers could be identified but did not test the telephone techniques of subjects to ensure that they were able to convert the knowledge into the foundation of the important skill. Nevertheless, it is widely accepted in the literature that distance education is more appropriate in the dissemination of knowledge than in the training of skills. This is particularly true of print-based media which are less interactive than, for example, well-designed forms of video. Interactive skills, like telephoning, are best learned by ensuring that subjects have ample opportunities to practice and to receive feedback so that they can monitor and improve their own performance. Print-based instruction is severely limited in this area.

Second, the package was designed and written by the researcher who had no previous experience of credit control. This was a bonus in so far as the subjects without any understanding of this topic were concerned but it was not advantageous from the point of view of those subjects with previous experience. The latter were more aware of the short-cuts which take place in the real-life work situation whereas the researcher included all aspects which were necessary, in order to satisfy the requirements of credit control supervisors and trainers.

Although some interviews did take place with employees currently engaged in credit control in the company before the design stage of the package, it was difficult from a diplomatic point of view to present the topic as it was actually practised since the trainers preferred to strive for the ideal. An example of this is the systems section of the package: credit controllers indicated that of a menu of eight options only two were used frequently; the systems experts requested that all options were tackled equally. The section was

written as a compromise, with emphasis placed on the two most important options although all eight options were included. This would go some way in explaining how Group 1 was able to achieve higher scores than Group 2. Clearly, the latter did not have the "irrelevant" information reinforced during work practises and therefore retained only the useful information.

Third, in the workplace the performance of credit controllers is assessed according to their ability to control the build up of debt on their accounts; it is not, therefore, important for them to retain factual information contained in knowledge-based tests. The main aim of credit controllers is to identify potential debt and to chase customers in order to avoid bad debt which is ultimately written-off or referred to the Legal Department in the company. It is unrealistic to assess the performance of credit controllers on this kind of test when skill-based training is such a vital part of their learning experience. This may have attributed to the comparatively poor performance of Group 2 on the tests.

Fourth, the way in which the tests were administered may have encouraged certain subjects to rely on information sources rather than their own retention. Group 1 were sent tests by internal mail and were requested to refrain from referring to the materials, asking colleagues or consulting manuals when completing the tests. Group 2 received the same instructions only from their supervisors rather than by memo. Although all subjects claimed to have completed the tests accordingly, it is possible that Group 2 were more inclined to do so because their supervisor was directly involved. However, the reverse could be argued; Group 2 was not subjected to any pressure and was not, therefore, inclined to be concerned about the score achieved.

Group 2 had a higher mean gain score than Group 3. Indeed, the performance of the former was significantly better. Group 3 represented the control group which did not receive the package, otherwise there was little difference between the two groups. Their starting knowledge levels were similar as were their ages, educational and motivational levels. In spite of the reservations about the validity of the test instruments, this finding has positive ramifications for distance learning in business. Clearly, distance learning has a role to play in increasing the knowledge levels of employees. Indeed, the potential of distance learning can only be enhanced if the topic of the package is directly related to the training needs of the learners and contains a true reflection of the activities carried out in the workplace. However, in reality the training needs are often initiated and imposed by the providers rather than the receivers of the training.

9.3 COMPLETION RATES AND SCORES

9.31 Non-respondents

The completion rate for Group 1 was 43%. Before examining how this rate compares to that of other distance learning courses, it is important to attempt to ascertain the reasons why some subjects failed to complete the course. A series of telephone calls and interviews was carried out after the deadline for completion had passed. Although it was intended that all eighty-three non-respondents would be contacted, seventeen of them had already left the company. The attrition is largely the result of the fact that the sample consisted primarily of youth and graduate trainees on a one- or two-year training programme.

In particular, subjects on the Youth Training Scheme (YTS) did not have the permanent prospects nor the financial remuneration offered by the company to the graduate trainees. As a result a proportion of trainees left the company before completing the training programme. A further five youth trainees had been transferred to other departments within the company. Eight subjects were withdrawn from the distance learning programme by their supervisors who anticipated that it would interfere with the other commitments of the trainees. Each of these subjects, however, was prepared to continue, although this was not considered to be possible without the support of their supervisors.

The remaining fifty-three subjects were interviewed in more detail. The majority (thirty-eight subjects) cited insufficient time as the main factor in preventing them from finishing the course. It is obvious that trainees within the company, irrespective of their positions, do not have enough time to undertake unrelated areas of training during work hours because their own training programmes are extensive and time-consuming. Consequently, any additional training must take place in their spare time and usually at home. This is true of the graduate training programme which requires subjects to travel throughout the UK, staying away from home, in order to receive a broad foundation of awareness of the different functions within the company. This places demands on trainees which are difficult for them to overcome, particularly if the course is regarded by the trainees as irrelevant.

However, it is not insufficient time that is the issue but rather

that subjects did not consider the course to be sufficiently worthwhile enough to justify spending their free time studying. The perceived value of the distance learning materials was low; the subjects were reluctant to increase their already heavy workload with credit control because they did not envisage ever having a use for the information. Some subjects went on to confirm that if the materials were directly relevant to their designated training programmes, they would have no choice other than to find time to complete the courses.

Other non-respondents (nineteen subjects) claimed that they had started the materials but had failed to complete them because they did not believe that anything of real value could be learned without a tutor or supervisor present; one subject remarked "*If it's worth learning about it should be part of a taught course*". Unlike the subjects who did not perceive the content of the materials to be relevant to them, these subjects represent a real obstacle to the success of distance learning in business because attitudes are more difficult to change than, for example, course content.

There is a need to increase the awareness of trainees so that distance learning is no longer regarded as the poor relative of conventional training. The prestige of distance learning must be heightened in order to prevent it failing as a training method largeley because of the blinkered attitude of those involved in the training system.

There was a conscious effort by the researcher to introduce the issue of training by distance learning before the subjects

commenced the course; subjects were sent a personalised introductory letter on agreeing to take part in the programme and again at the onset of the package. Evidently, in the case of those subjects who regarded distance education as inferior to conventional training this was not enough to quell their misgivings. It is important therefore not only to introduce the concept of distance learning to subjects new to this form of training (Pfeiffer and Sabers, 1970; Rekkedal, 1983) but more significantly to do it in such a way as to ensure that everyone involved recognises its potential and is willing to use it as a training method. Perhaps the most effective way of achieving this is by having an informal face-to-face discussion so that any misunderstandings expressed by potential users, administrators and supervisors of the materials can be clarified.

Admittedly, the mere suggestion of face-to-face contact appears to question the validity of a training method which by definition relies on various media often at the exclusion of face-to-face instruction. However, in defence of this recommendation, it is vital to point out that distance learning is a flexible method of learning which is designed according to the characteristics of specific users. Consequently, if one of the characteristics of the potential learners is that of lack of awareness, it is important to build into the system a means of overcoming this obstacle early in the learning process so that it does not jeopardise its future success. In addition, it is necessary to integrate distance learning into the whole work experience and in order to achieve this in an environment which has previously relied extensively on traditional face-to-face training, it is worthwhile to introduce an alternative or complementary training

method in such a way as to ensure that it receives the credibility it deserves. Finally, there is no reason why distance learning cannot offer learners the opportunity to interact with their peers or their supervisors on a face-to-face basis. Indeed, this is a characteristic built into comprehensive definitions of distance learning.

9.32 Completion rates

Although the term "drop-out" is often referred to in the literature, some researchers and educationalists prefer the more positive term of completion rate. A low completion rate, or high drop-out rate, is one characteristic of distance learning courses. When non-starters are included in the sample, completion rates are often lower than 50%. It would appear, therefore, that the completion rate of 43% achieved by Group 1 was not unlike that obtained by other distance learning courses.

According to Rekkedal(1983) distance learners aged over 27 years are more likely to complete a course than those under this age. The completion rate for those aged over 27 years in Group 1 was 46%, compared to 40% for those aged under. Although this appears to reinforce Rekkedal's findings, it is important to point out that the mean age for subjects on this programme was 20.7 years. The hypothesis would have been more thoroughly investigated if the age range of the sample had been greater; the maximum age was 28 years for men and 39 years for women. Whilst the overall completion rate for Group 1 was clearly comparable to that of educational distance learning programmes, in order to discuss what impact the business setting has on completion rate, if any,

it is important to look at the differences in the completion rates obtained by Groups 1 and 2.

9.33 Credit controllers versus non-credit controllers

Group 1 (non-credit controllers) had a completion rate of 43% whereas Group 2 (credit controllers) had a completion rate of 100%. This has important ramifications for the role of distance learning in business since the sample in Group 2 was closer to an actual population of credit control trainees in terms of motivation and training needs than Group 1. In addition, the implementation of the materials was different for Group 2 in that they used them as an integral part of their training in credit control.

Clearly, the distance learning experienced by Groups 1 and 2 illustrates two extremes on the continuum; Group 1 represents those learning from materials which may serve to improve their professional opportunities and which must be studied in their spare time without task-related support from supervisors; Group 2 represents motivated users learning from materials which are an essential requirement of their position whilst receiving reinforcement from task-related experience and supportive supervisors. The completion rate of the latter group, illustrates, the potential of distance learning in business.

9.34 Previous distance learning experience

The completion rate for those subjects in Groups 1 and 2 with experience of distance education was 71% whereas the completion rate for those without experience was 58%. This supports the findings of previous researchers who regard previous experience

of distance education to be the most important determinant of persistence on these courses (Rekkedal,1983). It also illustrates the necessity for students to familiarise themselves with this unique form of education before they embark on a course.

In this study, 17% of the subjects had previous experience of distance education, as distance learning becomes more widespread there will be an increasing number of students who have experience of distance education and who are therefore more likely to respond positively to such courses. What is also interesting is that the completion rate for those with experience was higher than it was for those without experience even though 71% of those with experience claimed that they had not enjoyed their previous distance learning course. Since only 38% of the respondents of this study claimed that they did not enjoy this course, one can assume that if they were required to be trained by this method in the future a high percentage of them would complete the materials.

It is a question not only of increased awareness but also of practice at coping with, and benefiting from, the special characteristics of this form of learning. Those subjects with previous experience of distance learning also scored significantly higher than those without experience. Evidently, these findings suggest that as distance education becomes more popular as a means of training in business, it will be accompanied by higher completion rates and better performance than are currently prevalent in, for example, the educational field.

9.35 Educational background

Subjects with academic qualifications were more likely to complete the distance learning course than those with no qualifications. Indeed, those subjects with at least a BSc, or equivalent, were more than twice as likely to complete than those subjects with no qualifications. It is important to consider how the educational background of subjects has a positive influence on completion rates in that the higher past academic achievement, the greater the chance of completing a distance learning course. There would appear to be similarities between the demands made on students by conventional education and those made by distance education. This is true to a certain extent of all levels of education in that students must rely on learning through printed text. Clearly, there is a percentage of students who have difficulties with learning in this way, perhaps preferring to learn through a direct involvement in the practical application of the task.

Those students who cope with the requirements of the educational system up to the level of BSc and above are more likely to be confident and successful at learning through print-based instruction. They are also able to manage their own learning experience since higher levels of education require students to be increasingly responsible for the achievement of their own learning objectives as well as those of the educational institution. Distance education also requires learners to assume responsibility for these objectives but to a much greater extent. In addition, higher education places greater emphasis than primary and secondary education on students learning alone,

moreover away from the educational institution. Again, these are important characteristics of distance learning.

Although the completion rates of subjects increased as the level of academic achievement increased, the same result was not evident in terms of the scores achieved. The findings of this study indicate that whilst subjects with A level or B.Tech qualifications scored higher than both subjects with O level/CSE and no qualifications and those with Postgraduate qualifications, there was no significant difference between the educational groups. In the interviews, some Postgraduate subjects indicated that they considered the style of the package to be patronising and the content too simplistic in comparison with the literature and course material they had used in the past. It would seem that the style and content of the materials was most suitable for the academic background of the A level and B.Tech group.

It would be interesting to discover if a similar cross-section of subjects would reveal similar completion rates if the topic of the course were different. It is possible that the actual content of the course and the way in which it was presented was more compatible with the learning skills possessed by those subjects with high levels of academic achievement. This is, however, unlikely since the aspects of credit control included in the package were introductory in nature and the presentation was considered by the respondents to be straightforward and easy to follow.

9.4 MOTIVATION

The results of this study support those of previous researchers

who found that motivation had a positive effect on the persistence of subjects on distance learning courses (see, for example, Dodds, Lawrence and Guiton, 1984); the higher the motivation of the subjects the greater their likelihood of completing the course. This finding appears also to be true of subjects irrespective of their learning styles. First, it is necessary to examine whether motivation influences completion rate; are subjects with high motivational levels more inclined to complete distance learning courses than less motivated subjects? Second, it is necessary to examine whether learning style influences motivation; do subjects with certain learning styles have higher motivational levels than those subjects with other learning styles? This study measured motivation according to subject response to the question *"How keen are you to study using distance learning materials?"*.

The motivational levels of Group 1 and Group 2 regarding the use of the distance learning materials were different. Group 1 was relatively well motivated considering many of the subjects did not perceive the materials to be of value as far as personal interest and professional advancement were concerned. Group 2, however, demonstrated higher motivation, much of which can be attributed to the fact that the distance learning materials formed an integral part of their training in credit control. Indeed, Group 2 received no other formal training, they were, therefore, compelled to study the materials for the sake of professional advancement, if for no other reason.

Group 2 was comprised of newly-appointed credit control trainees who were psychologically prepared for a training course,

moreover, one concerned with credit control. Although several subjects in Group 1 were also anticipating, or currently partaking in, training, none of them was intending to learn about credit control. Some subjects in Group 1 were not even on training programmes and therefore were not geared up to coping with the training demands made on them.

Although the lack of preparation in training might go some way in explaining why Group 1 was of a lower motivational level, it is more a question of the time demands envisaged by the subjects. The majority of Group 1 was engaged in a training programme not only unrelated to the topic of the distance education materials but also extensive and therefore time-consuming. Many of the graduate trainees, for example, could not envisage having any spare time at home, let alone at work, to dedicate to learning about credit control. Group 2, however, used the package at home and/or in the office either whenever they had a spare moment or for an allocated time each day.

One factor which may have influenced the motivation of subjects on completing the course was the way in which the materials were implemented. For example, Group 1 were sent their packages by internal mail whereas Group 2 had their packages administered by their supervisor or trainer. Group 1 was not made aware of their peers using the materials, whereas Group 2 was more likely to have shared a trainer with colleagues also using the package. Previous researchers have concluded that a personal system of implementation improves completion rates. Clearly, this is caused by high motivational levels resulting from an enhanced feeling of being part of a personal training system.

This study established that the higher the motivation of subjects, the higher their score on knowledge-based tests on completing the course. None of the subjects with the lowest motivational level (rank 5) completed the course, compared to 71% of those with the highest level (rank 1). This demonstrates the influence of motivation on the performance of distance learners, it is vital for them to want to study the materials otherwise they will be unable to cope with the obstacles commonly associated with distance learning. This is particularly true in the light of this study which involved subjects in using materials which were not related to their own training programme and which held little, if any, personal interest for them. The subjects who were highly motivated were not deterred by the conflict of responsibility between their domestic and professional activities.

The interviews reinforced this further as subjects complained about, for example, the telephone ringing or the children requiring attention. The more motivated subjects went on to dismiss these factors as a nuisance and proposed a way of overcoming them, whereas the less motivated subjects had decided to stop studying and put the materials to one side. Indeed, some of the more motivated subjects indicated that they had allocated a specific time each evening for studying after the children had gone to bed. Although the nature of distance education requires that subjects are faced with somewhat different learning conditions to those faced by conventional learners, it is evident that motivated subjects make efforts to overcome potential problems, whereas poorly motivated subjects regard them as adequate excuses to justify withdrawing from the course. Allowing

subjects to use their initiative to find out when and how they learn best encourages them to take control over their learning process whilst securing the future of distance education in business.

In reference to time, many subjects expressed regret that they not been allowed long enough to complete the package. However, the time allocated (seven months) was not considered to be restricting by those subjects who were more motivated to study the materials.

9.5 LEARNING STYLES

It is evident from this research that there is a difference between the motivational levels of different learning styles; divergers were the least motivated, followed by assimilators, accommodators and finally, convergers who had the highest level of motivation. There is also significant differences in the completion rates and the scores obtained by individuals of different learning styles. Although it is important to examine ways in which trainees can learn in their preferred style, it is also vital to decide whether improved performance results from enhanced preferred learning style or from an encouragement to adopt a more versatile style which incorporates characteristics of all four styles and minimises the weaknesses of any one style. Clearly, the latter is preferable, however, it is essential in distance learning to maintain the motivation of the learners and this might be difficult if forced to learn in a style to which they are not accustomed.

Divergers like to examine learning tasks from several

perspectives (Moore and Anderson,1969) giving them the opportunity to impose their own structure and diagnosis (Kolb and Fry,1975) on the learning experience. Although the theory of distance education encourages scope for diagnosis and choice of structure by learners, divergers enjoy using their imagination. Consequently, if they were unfamiliar with the theory and practise of distance education they might believe it to be a rigid textbook-based form of instruction. This kind of attitude may have contributed to the low motivation level of divergers compared to the other learning styles which deterred them from actually commencing the course materials and therefore resulted in their poor completion rate. The fact that many of these subjects considered distance education to be "last resort" training may also have influenced their completion rate.

Assimilators obtained the second lowest motivational level and also the second lowest completion rate. (It is important to point out that the completion rate of the assimilators was, however, considerably higher than that of the divergers.) Since they are cited in the literature as learning well by theoretical reasoning, it was anticipated that subjects with the assimilator learning style would have been more enthusiastic about using distance education materials, particularly since many of these respondents apparently that they believed distance learning to be textbook-based.

There are features of distance learning materials which might prevent assimilators from learning in their preferred style. Summaries and objectives, for example, are intended to organise and reinforce the main aspects of the topic and its implications

but assimilators like to reach their own theoretical conclusions. It is, therefore, essential to provide devices in the text which enable assimilators to perform their own reasoning. An example of such a device is the case study whereby learners draw their own conclusions from the pertinent facts provided.

According to Kolb(1975) accommodators are risk-takers who enjoy a challenge. This goes some way to explain why this learning style had the second highest motivational level; distance learning was a new phenomenon to over 80% of subjects. Indeed, it might have been anticipated that the accommodators would have had the highest motivational level but, as Moore and Anderson(1969) point out, accommodators like to learn in a situation cut off from the real world. Consequently, they did not enjoy the prospect of learning in their own time in familiar environments which were not designed specifically for the purpose of study. Nevertheless, because their completion rate was the second highest, they must have found aspects of the course compatible with their preferred learning style.

The concept of distance is appealing to accommodators who find the prospect of "sitting-by-Nellie" too confining. In order to improve their motivation and therefore their completion rate, it might be recommended that devices be incorporated within the material that encourage accommodators to plan and experiment. Exercises, such as scenarios which involve the learner anticipating what follows, might encourage this group to use the most developed aspects of their learning style. Accommodators perform most efficiently when faced with dynamic challenges and risks. As it becomes more accepted distance learning may cease to

appeal to these learners; it is crucial to examine ways in which the presentation, for example, of the materials can be varied in order to maintain the interest of accommodators.

The convergers had the highest motivational level and the highest completion rate. Although, according to Kolb and Fry(1975), convergers prefer their learning experiences to be linked to real-life situations, it is apparent that subjects with this learning style found distance education to be compatible with their preferences. The self-pacing aspect of this form of training is important to convergers (Moore and Anderson,1965) and they like to learn by discovery methods. Consequently, distance learning materials are an ideal means of ensuring that convergers receive the opportunity to self-manage that they require in order to learn most efficiently; many conventional face-to-face courses are structured and unresponsive and therefore fail to motivate convergers.

Another aspect of distance education which corresponds to the preferences of convergers is the need for personalised feedback. Admittedly, this is one area which can be problematic for course designers and writers; it is essential to have inherent feedback devices built into all distance education materials irrespective of the medium used. Making feedback more personalised than, for example, a computer print-out is a challenge facing designers who anticipate having convergers on their courses. Personalised feedback can be achieved by improving the relationship between tutor and student so that any communication is two-way and meaningful. Regular written or telephone contact is one way of improving this relationship.

It is worthwhile pointing out that unless the tutor considers the learning experience from the point of view of the student, a relationship based on personalised feedback is unlikely. It is evident from this research that convergers took the opportunity to communicate with the researcher during the programme. Unlike the divergers, however, who made the most telephone calls at the onset of the programme and during the first two weeks and who benefit from a personal and informal learning experience, the convergers contacted the researcher in the later stages of the programme and during the evaluation stage.

Convergers also had the highest completion rate. According to Kolb(1975) convergers learn most efficiently from specific problems which have only one correct answer. In the case of this particular distance learning package, such an approach was adopted not so much as a result of its didactic methodology but more as a requirement of the topic involved. Credit control training is well-defined when it applies to a given company; it enables all trainees to conduct certain procedures using the acquired knowledge in order to achieve the same end. It is, therefore, not a topic which could be discussed, for example, from several perspectives. Consequently, convergers are well-suited to this package; they were able to reach the correct solution in their own time and by their own methods.

9.6 ENVIRONMENT

Those subjects choosing to use the distance learning materials at home had significantly higher scores than subjects who worked in the office or in the study room at work. This is important because 60% of all subjects indicated that they would study at home during their spare time and 39% said the same about work time. The subjects

anticipated that they would be concerned about noise and interruptions during their spare time and about facilities in their work time. It is, however, clear that any distance learning conducted in the business setting would necessitate learners using the materials in their own time and probably at home.

Given the anticipated concern about noise and interruptions (due largely to the fact that 95% of all subjects did not live alone and of these 32% lived with children aged under sixteen years), it is perhaps surprising that the scores achieved in this environment during spare time were comparatively high. It is true that only those subjects who did not anticipate concern about factors such as noise and interruptions actually chose to study at home in their spare time; they expressed no concern at all on completing the course about noise, interruptions, professional responsibilities nor domestic responsibilities. The interviews and discussions highlighted the tendency for female subjects to be more worried about domestic responsibilities, such as housework, shopping and looking after the children than male subjects who revealed concern about the lack of facilities, such as the systems on which to apply the knowledge contained in the materials. The female subjects were also worried about these factors but to a lesser extent. Indeed, more females chose to study at work for this reason.

Noise, interruptions and domestic responsibilities were not considered by subjects to be a problem if they were allowed to work at home during work time. This arrangement, however, is not very feasible given the current climate of training which aims to maintain employees in the workplace in order to avoid a loss of labour as well as travel, subsistence and replacement labour costs. Distance

learning, consequently, appeals to many types of businesses; it is a means of redressing the problem of training so that businesses can make a reduced investment in training and reap the rewards of keeping employees in the workplace. Given the high scores obtained by subjects choosing to study at home and the preference for subjects to study in this way, the option to study at home should be offered to trainees.

Subjects choosing to study only in the office had the lowest mean score but were not significantly different from the scores of subjects using the materials in the study room at work. This a little disturbing since as many as 47% of subjects said that they would prefer to study in the office at work time. On the whole, subjects anticipated that they would be concerned about interruptions, their professional responsibilities, such as administration and making the necessary telephone calls, and the noise. Unfortunately, those subjects who actually chose to study in this environment were indeed very concerned about interruptions, noise, and to a lesser extent, their professional responsibilities.

This shows that unlike in the home environment where subjects anticipated problems and either avoided them by not studying in that environment or else did not find them not to be a problem after all, subjects choosing to study in the office during work time faced those problems anticipated by all the subjects. Evidently, subjects did not find the office environment to be particularly conducive to distance learning.

Some subjects chose to use the materials in the study room provided at work. It was intended by the trainers that this environment should

simulate the environment offered by educational institutions. The room was available to subjects throughout work time. It was the responsibility of individual subjects to allocate themselves a period for study. Despite the fact that noise, interruptions, domestic problems, and facilities were not a problem for subjects who chose to study in this environment, they performed significantly worse than those at home and no differently from those in the office.

It was anticipated that this would be an ideal environment for distance learning in that it would have the advantages of studying away from the workplace, as well as all the advantages associated with studying in the workplace. The interviews and discussions revealed that subjects in this environmental group found it inconvenient to have to decide in advance when they would like to use the study room. They claimed that it did not always coincide with an ebb in the workflow nor a mood conducive to learning.

It is, therefore, interesting that this arrangement actually deprives learners of one of the fundamental characteristics of distance education, namely the ability to choose when and where to study and at what pace. This would undoubtedly have an impact on the performance of learners on subsequent package-related tests.

9.61 Environment and learning style

The performance of different learning styles in different environments was also considered in order to take the investigation into the role of learning styles in distance training one step further.

It is interesting that the learning style with the lowest score and

completion rate indicated in the pre-package questionnaire that they preferred to study in the classroom, rather than at home or in an educational institution. This was the case irrespective of whether the study was carried out during the subject's spare time or during work time. Although distance learning is flexible in that it can be carried out in most environments, it is not usually conducted in a classroom because it necessitates the temporal and physical separation of the learning and teaching behaviour. The advantages associated with distance learning stem from this separation, such as the opportunity of learners to study where, when and at what pace they choose.

However, since the most important aspect of this form of learning is the choice of the learners, the option to study in a classroom environment cannot be overruled; distance learning and conventional learning can be combined to ensure that learners of the diverger style can learn efficiently. Kolb and Fry(1975) claim that this learning style performs best in perceptually complex environments which offer the opportunity to approach and discuss experiences from different viewpoints. Again, this indicates the necessity to incorporate face-to-face elements into the distance learning system.

According to Kolb and Fry(1975) the assimilator learning style dislikes a classroom environment, this research supports this finding; the assimilators claimed that they preferred to learn at home with no subjects indicating a preference for studying in an educational institution. This finding, however, suggests that assimilators should have felt most comfortable using the distance learning materials, whereas they had the second lowest completion rate and the second lowest score.

The accommodators did not wish to study in the office, preferring to study at home. However, Kolb and Fry(1975) state that this group like to study in the classroom, which is not supported by these findings, since the accommodators did not use the materials in the classroom and yet they had the second highest completion rate and the second highest score. Clearly, subjects in this learning style benefited from the opportunity to study at home during their spare time and would perhaps improve further if they were allowed to study in the same environment in work time.

The convergers, according to this research, like to work at home during their spare time and in the office during work time. It would appear that distance learning enables them to study in their preferred learning environment.

9.7 ATTITUDE

Since attitude is a major determinant in motivation, it is essential to investigate the change in attitude, if any, brought about by this research. Amongst the non-credit controllers, 54% of subjects were less keen to be trained by distance learning on completing the course than they were on its commencement, whereas amongst the credit controllers (Group 2) the majority of subjects (58%) was more keen to be trained in this way. Perhaps it is more satisfying to look at the non-credit controllers from a positive point of view by stating that 32% were more keen to use distance learning on completing than on commencing the course; 14% considered that their attitude had not changed. Since their achievement on this course in terms of the test scores were not made aware to them, the subjects' scores had no influence on their attitude to continue to use distance learning as a means of training.

The attitude of Group 1 is encouraging in that they were using unrelated materials and were, therefore, required to learn in their own time, moreover a substantial proportion of them were keen to study in this way in the future.

The attitude of Group 2 is also encouraging in that they enjoyed the course in spite of the fact that it was essentially experimental in nature; the researcher, along with two credit control trainers and three supervisors, was responsible for the writing, production, implementation, monitoring and evaluation of the materials; there was no infrastructure of administration and support to assist those involved in the system.

9.9 RECOMMENDATIONS

9.91 Design

The content of distance learning packages may appear to be an easy choice for potential course designers but it is vital to establish a balance between the knowledge- and the skill-based elements otherwise the instrument fails to satisfy either areas of training needs. It may be necessary to incorporate conventional training tools, such as seminars and role-plays, in order to ensure that the information contained in the package is being transferred correctly to the real-life situation. For example, the Journals unit of the package caused many non-respondents to cast the materials aside and resulted in queries being directed at the supervisors of Group 2. The former consequence was disastrous for distance learning and the latter was not much better because it placed additional workload on supervisors who had allocated their time to deal with other responsibilities, assuming that distance learning would free them of instructional tasks.

In addition, the style of the package is difficult to balance in that some subjects found the informative, chatty style to be patronising whilst others considered it friendly and easy to follow. It is, therefore, important to investigate the writing style preferred by the target population. However, since the role of the materials in distance learning comprises not only instructional but also tutorial responsibilities, the writer of the materials must always strive to establish a friendly, approachable style in order to overcome potential problems of isolation and declining motivation. This is true irrespective of the medium used for the package.

The use of pre-tests met with a varied response; some subjects believed that the pre-test interfered with their learning (although the findings of this research indicate that the pre-test did not effect the performance of subjects), whereas others found them a good way of measuring their progress. If it is necessary to establish the knowledge levels for the purposes of designing an appropriate package, pre-tests are a valuable means of achieving this objective. Similarly, in order to provide subjects with a fast-track through the package so that they can determine their own learning path, it may be necessary to include a pre-test.

The inclusion of full instructions regarding the benefit of the various design features to the subjects is crucial if the materials are to be used successfully. This study contained an outline of the functions of summaries, self-assessment questions and objectives and gave advice on how they should be used. An outline was, however, inadequate since during the interviews subjects revealed confusion concerning the use of these features which, ironically, were incorporated in the material in order to facilitate the learning process.

Self-assessment questions and exercises were, however, one aspect of the distance learning materials which were recognised by all subjects as useful and interesting. It is, nevertheless, vital to vary their format otherwise subjects can become demotivated.

9.92 Implementation

The implementation of the distance learning materials in the business environment distinguishes this form of training from the kind which takes place in educational settings. The supervisors and trainers who implemented the materials in this study were concerned that the system required strict policing. They were disappointed that they had not been able to leave the subjects to study on their own without any guidance or supervision. Clearly, this is a problem of attitude, not for the subjects but for their supervisors who regarded distance learning as an opportunity to concentrate on other responsibilities. It is evident that the role of trainers will change from knowledge disseminator to tutor and counsellor. Any awareness programmes initiated by the organisation must therefore include the effects of distance learning on trainers.

However, some degree of control by the organisation providing the training is required unless there is no limit on the time taken to complete the materials. It is recommended that the "supervision" of the learners is carried out by locally-based trainers so that they are accessible to the trainees. It is important that the trainers are involved in the introduction of the training course through to its completion and subsequent evaluation, in this way trainees will benefit from consistency and a more personal feedback system. Built into the system should be the opportunity for informal meetings with

colleagues for those trainees who need the more competitive and social elements of conventional training.

The control of the organisation can be further enhanced by the administration of the materials at predetermined intervals. This restricts the option of learners to select when and at what pace they study, although it does ensure that a specific number of trainees are exposed to particular materials at a given time. It cannot, however, guarantee that learners will use the materials during the allocated period unless trainee motivation is high. Ideally, learners should be allowed to decide whether they wish to receive the materials as part of a set programme or on a self-request basis. The motivation of the subjects influences not only the design but also the administration of the materials. This research indicates that the majority of subjects are willing and able to devote between 5-10 hours each week to studying. Highly motivated subjects, however, indicated that they would be prepared to spend between 21-25 hours each week being trained using distance learning.

It is worthwhile pointing out that when this question was posed in the questionnaire no mention was made of the duration of the distance training course. The interviews revealed that subjects would only be prepared to do this on a short-term basis, for periods lasting up to six months.

A number of subjects who failed to complete the course expressed dissatisfaction at the mere idea of being trained outside office hours without the benefits associated with residential training. They considered it to be the responsibility of the company to provide adequate training facilities during work time or else to offer

financial bonuses for time spent engaged in studying. Again, although this represents a question of awareness, it is essential to recognise and reward extra work by dedicated trainees.

9.93 Evaluation

The question of how to measure the performance of individual learners, groups of learners and the distance learning system itself is taking on new significance as businesses invest in distance learning as a fashionable and inexpensive alternative to conventional training which does not insist that trainees are removed from the workplace. In business the use of, for example, pre-tests is becoming increasingly popular because they offer a means of augmenting the amount of control exercised over the trainees by the providers of the training. Coupled with an identical post-test, pre-tests are also becoming an instrument for measuring the performance, and therefore the cost-effectiveness, of distance learning.

The potential problem lies not with the notion of cost-effectiveness since this cannot be divorced from business as it can sometimes be in education where priorities are, or at least ought to be, different, but with the test instruments used as indicators of cost-effectiveness. First, it is vital to decide whether the aim of the training is concerned with the achievement of personal satisfaction, professional advancement or both. Tests to confirm achievement are not usually necessary in the case of personal satisfaction because learners judge their performance according to their own criteria and have their own internal reward system. When professional advancement is concerned, however, the providers of the training ordinarily require some kind of measurement, not only to ensure that individual learners have achieved the objectives, but

also to provide a common standard amongst trainees. In addition, there is frequently a system of external reward in operation.

Second, it is necessary to design tests so that they reflect the actual knowledge and skills required to perform the task efficiently. In addition, if the tests are neither self-administered nor self-assessed, the learners must have access to the results so that they can identify the strengths and weaknesses of their own learning processes.

The evaluation of distance learning must also involve the retention of the imparted knowledge and its application in the workplace. Unfortunately, for the purposes of this study, the researcher was unable to track the performance of the credit controllers following their training programmes because of the confidential nature of debt collection, the high attrition rate in this department of the company and the time restrictions on the study period. It would have been very interesting to monitor the actual job-related performance of those credit controllers who used the package compared to those who received conventional training.

Another aspect of evaluation is the need to improve the learning experience of future recipients of the training. The psychological well-being of the learners should be monitored throughout the programme by the trainers; the regular conversation between learner and trainer will highlight potential problems as they occur and provide support and guidance not only for the learner but also for the trainer. Other ways of evaluating the success of the distance learning system from the point of view of the learners include group discussions and questionnaires.

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SECTION 2 : GETTING STARTED

2.2 Layout - How do I present my materials?

Since you are responsible for maintaining the interest of the students and therefore their learning performance, the presentation of your materials is vital.

You need to bear in mind how you use the following :

1. Space
2. Numbers
3. Colour
4. Tables
5. Graphs
6. Illustrations

2.21 How do I use Space?

There are certain guidelines to follow when designing distance learning materials, thus

- Begin items from the left
- Group information in five items, or less, in order to aid retention
- Use consistent word-spacing and line-spacing, identifying paragraphs using line spacing not indentation
- Avoid breaking words and sentences at the end of lines and pages respectively
- Use only one column of text on A4 paper if the text is broken continually by visual presentation
- A5 paper is more compact and therefore easier to carry
- Place related items closer together than unrelated items
- Repeat and highlight important facts and ideas (positioning them in the right hand margin is recommended to aid revision)
- Place visual aids at relevant points in the text
- Accompany visual aids with an explanatory statement
- If page turning separates a visual aid from the appropriate text, repeat the visual aid
- Avoid using footnotes
- Keep pages uncluttered

2.22 How do I use Numbers?

There are a few guidelines which are quite straightforward, thus :

- Use numbers sparingly and consistently
- Use Arabic numerals rather than Roman numerals
- Place numbers in the left-hand margin, if possible.

2.23 How do I use Colour?

It is important to :

- Use colour sparingly and consistently
- Use if for motivational or clarification purposes only
- Green is the colour most remembered so use it to highlight text where possible

2.24 How do I use Tables?

Make sure you have understood the recommendation on numbers, colour and space before designing tables. Use tables :

- When the information is precise or detailed (readings or measurements)
- When the information is operational (involving the students relating it directly to the functioning of systems, for example)

The presentation of tables is important if the students are going to be able to interpret them :

- Present complex tables so that they can be scanned vertically
- Leave tables unboxed unless several tables appear on the same page

2.25 How do I use Graphs?

It is important to understand the recommendations concerning the use of space, numbers and colour in order to design graphs that are easy to understand. Include graphs :

- When the learning task includes comparing or inferring trends from the information.

In presenting graphs, make sure that :

- If more than one line is necessary, you separate lines using typographic clues such as colour or boldness
- Both the horizontal and the vertical axles are labelled

2.26 How do I use Illustrations?

Illustrations and cartoons are used more widely in distance learning material than in other training material because the students motivation is as important as their understanding in the learning process. Therefore,

- Use illustrations to clarify information, arouse interest, express an opinion, relieve the learner from a complex task and to help learners with limited educational background.

It is important, however, that you :

- Use familiar representations
- Use humour cautiously in order to avoid offending or confusing students
- Keep pictorial symbols simple but as realistic as possible

SECTION 2 : GETTING STARTED

2.3 Writing - What kind of style do I use?

Your style of writing along with the presentation is the key to establishing a friendly, personal and individual relationship with your students.

Before you begin writing, imagine you are sitting with one student and you are about to have an informal tutorial. That is the style you are aiming at!

It is vital to be engaging, direct and interesting to maintain motivation. This is reinforced if you show an understanding of any problems the students might encounter.

For example :

"Hello. So you want to learn about aerodynamics. Well, before I explain how we're going to approach the topic, let's have a quick look at how you are feeling. Don't worry if you are a little anxious about learning by this method - once you start the package, you will find it a very convenient and enjoyable way to study. Afterall, this package has been deisgned specifically for you"

In this way, you reassure the students. Explain what is expected of them, how the separate sections fit into the overall course and how the objectives can be achieved.

In order to build a relationship of respect and understanding with your students, there are guidelines to bear in mind :

- Use the first person singular 'I' and address the students as 'you'
- Use 's/he' or, if you find it a little clumsy, keep to the plural form 'they'
- Avoid using language and stereotypes that may offend women, black people, old people, etc.
- Use humour, etc., only in instances where you are sure it will be understood and appreciated by the students
- Use abbreviations and colloquial expressions if you think it will make reading easier.

For example :

The tutor will show the students how he ~~or she~~ will be able to apply what he or she has learned from the self-assessment questions to his or her profession.

Better example :

I'll show you how you'll be able to apply what you've learned from the SAQs to your work.

Therefore :

- Be brief, positive and non-technical wherever possible
- Make sure that you define technical words and abbreviations whenever you introduce them. I recommend that you highlight them in bold the first time students meet them
- Use simple, clear sentences and vary sentence length and structure to maintain motivation
- Avoid using clichés

THE ATTRIBUTES OF VARIOUS FORMS OF ASSESSMENT

Test	Description	Advantages	Disadvantages
Multiple-Choice	Requires identification of the correct answer from a menu of possible answers	<ul style="list-style-type: none"> • Answer provided • Easy to correct • Easy to assess • Quick to perform 	<ul style="list-style-type: none"> • Not very useful for revision • Scope for guesswork • No middle-ground answers • No indication of student method • No provision for practising writing skills • Test only low-level recall
Completion Tests	Required completion of sentence, phrase, table, etc.		
Re-arrangement Tests	Requires re-ordering of list of events, dates, etc.		
Open-Ended Questions	Requires sentence, paragraph, table, etc.	<ul style="list-style-type: none"> • Answer provided • Provides practice of writing skills • Tests understanding and use of resources to support argument 	<ul style="list-style-type: none"> • Not always used by student as intended • Time-consuming if lengthy answer requested • No feedback on individual's particular mistakes • Requires model answer from tutor
Assignments, Projects, Practical Work	Requires submission of answer for tutor assessment.	<ul style="list-style-type: none"> • Provides practice of writing skills • Tests understanding and recall of knowledge • Can test skills related to real-life situation • Individually assessed • Increases student involvement in the learning process 	<ul style="list-style-type: none"> • Time-consuming for student • Feedback delayed • Requires additional effort & time of tutor • Paces student (can be an advantage)

THE ATTRIBUTES OF VARIOUS MEDIA

Medium	Advantages	Disadvantages	Recommended
Print	<ul style="list-style-type: none"> • Permanent record for revision • Easy to use • Cheap to produce & administer • Two-way communication possible if assignments are included 	<ul style="list-style-type: none"> • Assumes literary and cultural background of student • Cannot assist in learning many motor or interactive skills 	<ul style="list-style-type: none"> • Whenever knowledge is being learned • Always use print as a supplement to other media to provide a record for students
Audio-Tape	<ul style="list-style-type: none"> • Easy to use • Sound of voice increases motivation • Quite cheap to produce & administer • Accessible to student 	<ul style="list-style-type: none"> • Revision difficult • Needs visual support (notes, booklets, etc.) • Must be used in sequence 	<ul style="list-style-type: none"> • For language pronunciation • For reinforcement of main concepts & ideas • For tutor advice / study skills
Computer	<ul style="list-style-type: none"> • Simulates real-life problems • Provides feedback • Interactive to certain extent • Scope for computer-mediated conversation 	<ul style="list-style-type: none"> • Learner and tutor need computer skills • Not permanent record so revision difficult • Needs skills to update • Expensive • Not always accessible 	<ul style="list-style-type: none"> • Computer-related problems and skills (needs written supplement)
Video	<ul style="list-style-type: none"> • Shows motion, change or processes • Shows real-life situations • Assists in learning motor & interactive skills 	<ul style="list-style-type: none"> • Expensive to make • Not permanent so revision difficult • Not always accessible 	<ul style="list-style-type: none"> • To show real-life situations (use in conjunction with group discussions & print)
Interactive Video	<ul style="list-style-type: none"> • Interactive • Provides feedback • Helps student learn motor & interactive skills • Motivates student 	<ul style="list-style-type: none"> • Expensive to make & update • Not easily accessible for student • Needs written supplement for revision 	<ul style="list-style-type: none"> • For motor skills and interactive skills (needs written supplement for permanent record of progress for student and for revision notes)

LEARNING STYLE

This exercise is designed to help you to clarify your own preferred style of learning. You may find it helpful as you go through the exercise to think of situations in which you know you have learnt about things. As you go through the list, working from left to right, give a high rank (4) to those words which best describe or characterise the way you learn and a low rank (1) to those words which least describe the way you learn.

INSTRUCTIONS

There are nine sets of four words listed below. Go through each list across the page and rank the words from 1 - 4. The word you rank as 4 should be the one which best describes or characterises the way you learn. Be sure to assign a different rank number to each of the words in each set. Do not make ties.

As an example : An individual's ranking of set one might look like :

1. 3 discriminating 2 tentative 1 involved 4 practical

Now complete each set of words in turn :

- | | | | |
|-----------------------------|------------------|-----------------------------|----------------------|
| 1. discriminating | tentative | involved | practical |
| 2. receptive | relevant | analytical | impartial |
| 3. feeling | watching | thinking | doing |
| 4. accepting | risk taker | evaluate | aware |
| 5. intuitive | productive | logical | questioning |
| 6. abstract | observing | concrete | active |
| 7. present
oriented | reflecting | future
oriented | pragmatic |
| 8. experience | observation | conceptuali-
sation | experimentation |
| 9. intense | reserved | rational | responsible |

FOR SCORING ONLY - Please leave blank for now :

A	B	C	D
234578	136789	234589	136789

1. Introduction

This unit introduces you to some very important aspects of credit control. Make sure that you've worked through Unit 1 before tackling this unit, otherwise I might assume that you are familiar with something you haven't met before.

This is a very short unit. It does however contain basic information that is used in most credit control activities.

In the first part , I'll show you what customer account numbers look like and how they are assigned.

You have met some means of identification, namely the sales ledger and region codes. In the second part of this unit I'll introduce you to another means of identification - the admin unit. In the final part, I'll explain the different types of customer accounts that make up the sales ledger.

2. Objectives

After studying this unit you will be able to

1. State how many digits a Rank Xerox account number has
2. State how an account number is allocated
3. State the range of account numbers
4. Define the term admin unit in one sentence
5. State 2 ways in which account nos. are assigned to credit controllers.
6. List the 4 different types of customer accounts which appear on the sales ledger.

3. Text.

3.1 Account number

The customer **ACCOUNT NUMBER**
(Account no.) appears on all customer
documents and computer systems. It
is the most important form of
customer identification.

Once you're more familiar with
credit control terminology, I'll
show you the entire process of
assigning an account no. including
how to open an account.

ACCOUNT No. has 6 dig

For the time being you need only
to be able to recognise an account
no. and to understand what it
refers to.

The customer account no. has 6
digits.
For example,

Account no. 020310
British Airways

3.2 Allocation of account no

The account no. refers to the customer's name. It is roughly alphabetical since the first 2 digits stand for the first letter of the customer's name.

For example,

020310 British
Aerospace

06.... Ferranti

So, 01 refers to the letter A

02 " " " B

03 " " " C

etc. until

26 " " " Z

If the customer changes her/his name after s/he has opened an account, the account no. remains the same.

★ ★ ★ ★ ★ ★ ★

SAQs

What would be the first 2 digits of the account no. of Mr J. Smith & Son?

ACCOUNT NO. has 6 digits. First 2 digits refer to the first letter of customer's name. Range from 01.... to 26....(A-Z)

Answer:

19.... Mr J.Smith & Son

*The first 2 digits
refer to the surname
or the main name of
the customer or
company.*

* * * * *

3.3 Range of account nos

You would expect
account nos. to range
from 010000 to 269999
(lowest no. in A to
highest no. in Z).

Unfortunately, it's not
always as straight
forward as that; for
example, some
customers have account
nos. 27.... to
30..... Customers with
account nos. ranging
from 270000 to 309999
usually belong to Rank
Organisation or the
Government.
Government accounts
for example have
account nos. 29....

If you're wondering
what the remaining 4
digits represent, don't
worry they are purely
for identification
purposes.

SAQs:

Here are some invented account nos. Write the first letter of the customer name beside it. Check your answers with those below.

- a, 083261
- b, 244099
- c, 130000
- d, 169997
- e, 299932

* * * * *

Answers:

- a, Homewarm Ltd.
- b, Mrs A. Young
- c, McIntosh & Stewart
- d, K. Patel
- e, For example, Rank Organisation

* * * * *

3.4 Admin units

You know already that geographical regions, like the North, are divided into sales ledger areas, like the Midlands.

It is also necessary to share out the workload within each sales ledger areas into ADMIN UNITS. Each individual credit controller is responsible for the accounts in her/his admin units.

Each admin unit consists of a certain number of accounts. Your credit supervisor will assign you a certain number of accounts so that every credit controller has a similar workload.

ADMIN UNITS (a number of accounts) make up a sales ledger area. These in turn make up a region. .

Activity.

Can you think of any other advantages in having admin units?

★ ★ ★ ★ ★ ★ ★ ★

If you are responsible for the same accounts all the time, you will get to know the details of individual customers and their accounts.

This is a huge advantage of admin units. You will be able to monitor your accounts, identify overdue accounts and collect cash more efficiently if you are familiar with your own customer accounts.

3.5 Sharing the workload

There are two ways in which the accounts are allocated to credit controllers.

Firstly, they are allocated according to account nos.

For example, you might be given account nos. 010000 - 129999 (A - L inclusive).

3.6 Types of accounts

3.61 KEY ACCOUNTS

These belong to the top national 120 R.X customer in terms of revenue. They have a separate sales force and are treated differently regarding credit sanction and cash collection.

KEY ACCOUNTS concern the top 120 R.X customers in terms of revenue.

3.62 MAJOR ACCOUNTS are accounts which involve very large machines or a lot of machines. They also enjoy discount facilities and are treated differently when it comes to pursuing debts.

MAJOR ACCOUNTS are customers with a lot of RX machines or very large machines on their accounts.

Large banks, for example, might be considered as key accounts since they have many outlets for RX machines and supplies.

Selected credit controllers are responsible for certain key accounts held at their branch.

3.63 STANDARD COMMERCIAL

These customers are the ordinary sort of small business customers.

STANDARD COMMERCIAL CUSTOMERS are small business customers.

3.64 ALTERNATIVE

DISTRIBUTION refers to dealers and stockists (of paper, etc.)

ALTERNATIVE DISTRIBUTION describes dealers and stockists.

These 4 types of accounts make up the sales ledger. In the South,(M.K) there is a additional type of account on the sales ledger , namely Government accounts.

SAQs:

a, Define the term admin unit in one or two sentences.

b, State 2 ways in which admin units are assigned.

c, List 2 advantages of having admin units.

d, State the main difference between standard commercial and major accounts.

* * * * *

Answers:

a, Admin units make up a branch. They are batches of account nos. that are assigned to individual credit controllers.

b, They are assigned according to either a range of account nos or depending on the type of account.

c, Admin units enable the workload to be shared evenly and also encourage individual credit controllers to become familiar with their customer accounts.

d, The main difference between standard commercial and major accounts is the number or size of the machines on the account.

Hello!

This is just a short letter to let you know what this questionnaire is all about. I'm finding out what you think about the idea of teaching yourself credit control using a self-contained package.

Your replies will help me to recommend future training methods which will suit you best. It is therefore very important that I obtain your opinions since you are likely to be affected most by these decisions.

It's essential to fill this questionnaire in carefully, as I would like your thoughts on all the questions asked. I assure you that your replies will be treated confidentially and will be used for statistical purposes only.

If you have any questions please speak to your supervisor or ring one of the 'phone numbers below and ask to speak to me.

Thank you very much for your help. I'm looking forward to hearing your ideas.

yours sincerely,

L.Gilroy

Instructions

Please read these before completing this questionnaire.

As you know I'm trying to find out what you think about learning from packages. It doesn't matter if you have no experience of this kind of training because your views will still be very important to the study.

I've kept this questionnaire as brief and concise as possible.

1. Some questions have a space provided for you to write your reply.

2. Some questions have replies provided to save you time. Here is an example of one of these:

What do you think about filling in this questionnaire?

Very boring 1 2 3 4 5 very interesting

***if you thought that filling in this questionnaire was really interesting, you would put a ring around the number 5, thus**

very boring 1 2 3 4 ⑤ very interesting

***if you considered it to be quite boring but not too bad, you would put a ring around a low number like 2, thus**

very boring 1 ② 3 4 5 very interesting

***if on the other hand you had no opinion ,or didn't know, you would ring the middle number,3,thus**

very boring 1 2 ③ 4 5 very interesting

So when answering a question which has the answers provided like this, just pick the number which seems to best fit how you feel and put a ring around it.

A.Distance Learning

Perhaps you haven't met the term 'distance learning' before. It refers simply to a form of training that involves you teaching yourself with a package which has been designed especially for you. Since this form of training doesn't require a trainer to be present you can learn when and how you please.

**1. Have you ever been on a course involving distance learning materials?
(Please ring your answers)**

a, No (GO ON TO Section B)

b, Yes

**---2. Was the course for personal interest or
professional qualifications?**

***.personal interest**

***.professional qualification**

---3. Did you think the course was,

*** very boring 1 2 3 4 5 very interesting**

*** very easy 1 2 3 4 5 very difficult**

*** very enjoyable 1 2 3 4 5 not at all enjoyable**

---4. When it came to completing it did you have,

*** too much time 1 2 3 4 5 too little time**

---5. Did you study (please ring the correct answer(s)),

*** at home**

*** at work**

*** in an educational institute eg ,a library**

Yes (cont'd)

---6.Did you complete the course?

Yes (GO ON TO B)

No -

**---7.Can you tell me why you choose to discontinue the course?
Which of the reasons in the list below were applicable?**

****too little time***

****too little finances***

****too many other responsibilities at home***

****too many other responsibilities at work***

****loss of interest***

****satisfied that you'd learned what you wanted to without
finishing***

****other (please state briefly)***

**---8.To sum up , what would you say were
the 2 greatest advantages?**

(1).....

(2).....

----9.....and the 2 greatest disadvantages?

(1).....

(2).....

B. Your time

I'm very interested to find out how you feel about training by yourself with distance learning materials . I would also like to know when and where you would be able to study to benefit you most.

1. Could you tell me whether you are (please tick your answer)

*** out of work (GO ON TO QUESTION 3)**

*** at work -----**

*** a student -----**

**2. How many hours do you spend at work on average each week?
(Please state)**

.....hours

How would you feel about using distance learning materials to train yourself? Answer these questions with your own circumstances in mind.

3. Suppose it was necessary for you to gain a professional qualification and you were given the opportunity to use distance learning materials to achieve this. How would you feel?

***very keen 1 2 3 4 5 not at all keen**

4. How many hours of your spare time would you be willing (and able) to devote to studying each week?

***less than 5**

***5 - 10**

***10 - 15**

***15 - 20**

***20 - 25**

***more than 25**

5.If you were required to study in your spare time would you choose to study, *(Please ring the correct answer(s))*

****during the week***

****during the weekend***

6.Would it suit your own circumstances to study in the

****morning (before midday)***

****afternoon (12 - 5pm)***

****evening (5-10pm)***

****night (after 10pm)***

Now let's look at where you would choose to study. Remember to answer these questions with your own circumstances in mind!

7.Suppose you could choose where to study to enable your to learn most efficiently due to your circumstances .Where would you study in your spare time?

****at home***

****at work***

****in an educational establishment like a library***

8.If you were allowed to study in your worktime where would you choose to study?

****at home***

****at work***

****in an educational establishment like a library***

8.If it was necessary for you to study at home in your spare time, how would you feel?

very happy 1 2 3 4 5 very unhappy

How concerned would you be about,

*noise very concerned 1 2 3 4 5 not at all concerned

*interruptions " " 1 2 3 4 5 " "
eg. telephone

*domestic responsibilities " 1 2 3 4 5 " "
eg. housework

*professional responsibilities " 1 2 3 4 5 " "
eg.overtime

*facilities " " 1 2 3 4 5 " "

9.If it was necessary for you to study at home during worktime, how would you feel?

very happy 1 2 3 4 5 very unhappy

How concerned would you be about,

*noise very concerned 1 2 3 4 5 not at all concerned

*interruptions " 1 2 3 4 5 " "

*domestic responsibilities " 1 2 3 4 5 " "

*prof. responsibilities " 1 2 3 4 5 " "

*facilities " " 1 2 3 4 5 " "

10. How would you feel about studying during worktime at work?

very happy 1 2 3 4 5 very unhappy

How concerned would you be about,

**noise very concerned 1 2 3 4 5 not at all concerned*

**interruptions " 1 2 3 4 5 " "*

**domestic responsibilities " 1 2 3 4 5 " "*

**prof. responsibilities " 1 2 3 4 5 " "*

**facilities " 1 2 3 4 5 " "*

C. Personal Details

Finally, for statistical purposes only, would you mind giving a few details about yourself. These will be treated in the strictest confidence!

1. Please write your age

.....years

2. Are you ,

Male

Female

3. Do you live alone?

Yes (GO ON TO QUESTION 8)

No

-4. How many people live in your household? (please state)

-5. Do you live with any children?

No (GO ON TO QUESTION 8)

Yes -----

-6. How many?

-7. How old are they?

8. Do you have any educational certificates? (Please ring which apply)

NONE

ONC / OND / 'O' TEC

HNC / HND / 'H' TEC

CSE / 'O' LEVEL

UNIV. or POLY. DEGREE

other, (state below)

.....
.....
.....
.....
.....

9. How long is it (in months or years) since you undertook any kind of education / training?

.....

10. Have you studied in your own time since you gained your certificates ?

No (GO ON TO 12)

Yes

11. Did you study,

***at home**

***at an educational establishment**

12. How long have you been in your present work (or out of work if you are out of work)? (Please state)

.....years

13. How long have you been with your present company? (Please state)

.....years

Have you any further comments that you would like to make concerning anything raised in this questionnaire? If so, please write in the space below or use a separate sheet of paper if you wish.

Hello again!!

Don't worry: this questionnaire is much shorter than the previous one.

This time I'd like to find out what you thought about the credit control package that you've just completed. Your opinions are vital to help me to assess this form of training. As a result of this study your future training will be geared to suit your own requirements and preferences.

Naturally, your replies will be treated confidentially and used for statistical purposes only.

If you have any questions concerning the package or either of the questionnaires don't hesitate to ask your supervisor or contact me on one of the 'phone nos. below..

Thanks again for your invaluable help.

yours sincerely

L.Gilroy

A.The Package in General

Before we find out what you think about distance learning as a form of training, would you mind answering a few questions about this credit control package? Fill it in in the same way that you filled in the pre-package questionnaire.

1. Did you think the package was; (circle your answer)

*very boring 1 2 3 4 5 very interesting

*very easy 1 2 3 4 5 very difficult

*very enjoyable 1 2 3 4 5 not at all enjoyable

*convenient to use 1 2 3 4 5 inconvenient to use

*too bulky 1 2 3 4 5 not at all bulky

2. Did you think the format / presentation was;

*very easy to follow 1 2 3 4 5 very difficult to follow

*very easy to dip into 1 2 3 4 5 very difficult to dip into

*very pleasing to look at 1 2 3 4 5 unpleasing to look at

3. Please write your name here

.....

B.Completing the Credit Control Package

1. Did you finish the whole package? (Please ring your answer)

YES
NO

2. Did you have;

*too much time 1 2 3 4 5 too little time

3. How long did you spend on the whole package?

.....hours

4. Did you work through the package in chronological order (ie. background unit through to unit 9 in that order)?

YES (GO ON TO QUESTION 7)

NO--

5. Was your order (Please ring your answer)

*your supervisors choice

*your own choice

6. List the order in which you completed the units?

First Second, etc

Last completed

....

7. Did you find all the units to be of the same difficulty? (Please ring your answer)

YES (GO ON TO QUESTION 9)

NO

8. Rank the units according to how difficult you found them. (Write the most difficult unit next to a, and the next most difficult next to b, etc.)

a, unit-----	(most difficult)
b, "-----	
c, "-----	
d, "-----	
e, "-----	
f, "-----	
g, "-----	
h, "-----	
i, "-----	
j, "-----	(least difficult)

9. In your opinion, was any of the units too lengthy or too brief?

NO (GO ON TO SECTION C)

YES

10. Would you please tell me how you felt about each of the units below?

background unit	too lengthy	1	2	3	4	5	too brief
unit 1	too lengthy	1	2	3	4	5	too brief
" 2	too lengthy	1	2	3	4	5	too brief
" 3	too lengthy	1	2	3	4	5	too brief
" 4	too lengthy	1	2	3	4	5	too brief
" 5	too lengthy	1	2	3	4	5	too brief
" 6	too lengthy	1	2	3	4	5	too brief
" 7	too lengthy	1	2	3	4	5	too brief
" 8	too lengthy	1	2	3	4	5	too brief
" 9	too lengthy	1	2	3	4	5	too brief

C. Your Study Pattern

In the previous questionnaire I found out how you thought you would like to study if it was necessary for you to take a distance learning course. Now, I'd like to see how you did use this credit control package.

1. Did you study the whole package in the same kind of environment (eg. at home) ?

YES

NO

2. Would you please indicate where you studied each individual unit? (eg. if you studied unit 6 at home write unit 6 beside * at home) If you studied them all in the place write ALL beside the correct answer

*** at home**

***in the office**

***in a study room at work**

***in an educational establishment**

Answer the following questions (3&4) only if you actually studied the package at home. (If you studied it at work /at university GO ON TO QUESTION 5).

3. Did you study the package at home ; (please ring your answer(s))

***during worktime**

***in your spare time**

4. When you were studying (at home) how did you feel about :

***noise very concerned 1 2 3 4 5 not at all concerned**

***interruptions " " 1 2 3 4 5 " " "**
eg. telephone

***domestic responsibilities " 1 2 3 4 5 " " "**
eg. housework

***professional responsibilities " 1 2 3 4 5 " " "**
eg. overtime

***facilities " " 1 2 3 4 5 " " "**

Answer the following questions (5 & 6) only if you studied the package at work or at the university.(IF NOT GO ON TO QUESTION 7)

5.Did you study (at work or the university) : (Please ring your answer(s))

***during worktime**

***in your sparetime**

6.When you were studying how did you feel about :

***noise very concerned 1 2 3 4 5 not at all concerned**

***interruptions " " 1 2 3 4 5 " " "**
eg.telephone

***domestic responsibilities " 1 2 3 4 5 " " "**
eg. housework

***professional responsibilities " 1 2 3 4 5 " " "**
eg. overtime

***facilities " " 1 2 3 4 5 " "**

Answer the following questions (7 & 8) only if you are a trainee credit controller and you studied the package in an educational establishment. (IF NOT GO ON TO SECTION D).

7. Please name the type of educational establishment you studied in (eg. a library) .

8. Did you study (in the educational establishment) : (ring your answer(s))

***during worktime**

***in your spare time**

9. When you were studying how did you feel about :

***noise very concerned 1 2 3 4 5 not at all concerned**

***interruptions " " 1 2 3 4 5 " " "**
eg. telephone

***domestic responsibilities " 1 2 3 4 5 " " "**
eg. housework

***professional responsibilities " 1 2 3 4 5 " " "**
eg. overtime

***facilities " " 1 2 3 4 5 " " "**

D. Distance Learning

It would be very useful for me to have your opinions on distance learning packages as a form of training. Base your replies on your experience of the credit control package.

1.How do you feel about being trained by distance learning?

very happy 1 2 3 4 5 not very happy

2.What would you say are the 2 greatest advantages of this training method?

(1) -----

(2) -----

3.What would you say are the 2 greatest disadvantages of this training method?

(1) -----

(2) -----

I'm very interested in your feelings towards this package .H ave you any ideas on how it could be improved , for example?

If you had any problems that you feel I haven't covered well enough in this questionniare or if you have any general comments to add, please write them in the space below.

Instructions

A. Please rank [1-4] the following words according to how well they describe your own way of learning.

For example,

-----feeling -----watching -----thinking -----doing

If "doing" is a better way of describing your way of learning than "feeling", "watching" or "thinking", write 1 next to "doing". Like this,

-----feeling -----watching -----thinking -----doing

If "feeling" is the second best word to describe it write 2 next to "feeling". If "watching" is the third best word write 3 next to it. Finally, if "thinking" is the least accurate word write 4 next to it.

Your completed answer would then look like this:

-----feeling -----watching -----thinking -----doing

B. Complete all 9 rows .

C. The meaning of some words is shown below them.

A-----discriminating	-----tentative	-----involved	-----practical
:considering differences carefully.	:not definite; hesitant.	:complicated	:involving practice

B-----receptive	-----relevant	-----analytical	-----impartial
:able or quick to receive impressions or ideas about things	:bearing to the matter at hand	:examining minute details	:being fair; unbiased

C-----feeling	-----watching	-----thinking	-----doing
----------------------	----------------------	----------------------	-------------------

D-----accepting	-----risk-taker	-----evaluate	-----aware
:believing things		:assessing things of things	:having knowledge of things

E-----intuitive	-----productive	-----logical	-----questionning
:having immediate understanding of things;without reasoning	:achieving results	:reasoning things through correctly	:asking questions

F-----abstract -----observing -----concrete -----active

:separated from
reality;ideal

:taking notice
of;following

:real;definite

:practical;
working

**G-----present-
oriented**

-----reflecting

**-----future-
oriented**

-----pragmatic

:concerned with
what's happening
now

:thinking back
reminding
yourself

:concerned with
what's going
to happen

:treating things
matter-of-
factly

**H-----experience -----observation -----conceptual-
isation -----experiment-
ation**

:feel;undergo

:following;
examining

:looking at things
as general ideas

:trying things out

I-----intense

-----reserved

-----rational

-----responsible

:eager;strong
emotions

:slow to express
opinions

:reasoned
statements

:trustworthy;
respectable

**Distance Learning Package (Pretest)
CREDIT CONTROL**

Hello!

This distance Learning package has been designed especially for you so it's important that it is an effective way of helping you to learn about CREDIT CONTROL.

In order for me to test its effectiveness, I need to know how familiar you are already with the subject of credit control. I would be very grateful if you would complete the following test before you start the package and again once you've completed it .

In this way, I'll be able to discover how well I have designed this credit control package. (Don't worry if you are unable to answer many of the questions in this pretest; you're not expected to know anything about credit control at this stage!)

Thanks very much!

Instructions:

Attempt as many questions as you can.

Answer the questions briefly.

Write X beside the questions that you have attempted but are unable to answer; if you do not attempt a question leave it blank.

UNIT 1

- 1. State the main aim of credit control in RX**
- 2 List 4 activities of credit control involved in achieving this aim**
- 3. List the 8 main functions of RX**
- 4 State what function credit control is part of**
- 5. Name the 2 broad divisions of this function within RX**

- 6. State the 2 components of the centre**
- 7. List the 4 geographical divisions of this function**
- 8 State the purpose of the sales ledger and region code.**

UNIT 2

- 1. State how many digits a Rank Xerox account number has**
- 2. State how an account number is allocated**
- 3. State the range of account numbers**
- 4. Define the term admin unit in one sentence**
- 5. State 2 ways in which account nos. are assigned to credit controllers.**
- 6. List the 4 different types of customer accounts**

UNIT 3

- 1. Define the term invoice in one sentence**
-
- 2. List the 4 types of customer agreements**
- 3. State the 5 different kinds of invoices and when they are generated in the case of each type of agreement**
- 4. State whether each must be paid in arrears or in advance**

5. Quote the payment terms printed on each kind of invoice

6. List 3 types of details contained in a RX invoice.

UNIT 4

1. State the purpose of the RX statement in one sentence

2. Explain when a statement is issued and where it is issued from in a brief sentence

3. Name 3 details that appear on a credit controller's copy of a statement

4. List the order in which items appear on this statement

- 5. State where and how copies of statements are kept**
- 6. Define the term credit note**
- 7. State one occasion which might result in a credit note being issued.**
- 8. State the prefix given to T&M, ORS, FSMA, Rental and Manual credit notes.**
- 9. State the prefixes given to T&M, ORS, FSMA, Rental, Sale and Manual invoices.**

UNIT 5

- 1 . Define the term standard collection cycle in one or two sentences**
- 2. List the documents that the customer will receive before the standard collection cycle begins**
- 3. Name one instance in which the cycle is temporarily suspended.**
- 4 . State the main message of the 'B' and the 'C' letters sent to customer's with credit status codes of H, M, and N in one or two sentences**
- 5. State when these 'B' and 'C' letters are sent**
- 6 Define a tab / report in a short sentence**
- 7 List the 3 different types of tabs / reports and when each of them is issued**

UNIT 6

- 1. Describe how the sales ledger is connected to the standard collection cycle, in a brief paragraph.**

- 2. Define the term journal in one sentence**

- 3. List the 3 essential functions of the RX journal**

- 4. Define the term control account**

- 5. State which 3 sections of a journal the credit controller should complete**
- 6. State what the reference code 'D' (and 'E') means when it appears on the sales ledger in one or two sentences.**
- 7. Define the term lodgement number in one sentence.**
- 8. Define the term cross boundary in one sentence**
- 9. State the procedure to adopt if a customer sends payment directly to the credit controller.**

UNIT 7

- 1. State one way of recording the details of your contact with the customer, including the type of information recorded and how it is filed.**
- 2. List 3 common types of queries**
- 3. Define the term CLUES in one sentence.**
- 4. State the main purpose of CLUES in one sentence.**
- 5. State the main purpose of Customer Liason as far as credit control is concerned.**

UNIT 8

- 1. List one way in which customer records are stored manually.**
- 2. Define MINAF in one sentence**
- 3. State the main purpose of MINAF for credit controllers**
- 4. List the 5 steps in entering the MINAF system**
- 5. Define the term product code in one sentence.**

6. Define OLE in one sentence

7. State the main purpose of OLE for credit controllers

8. List the 5 steps to entering the OLE system

9. State which option from OLE is most used by credit controllers

10. Define Debtors Focus in one sentence

- 11. State the main purpose of Debtors Focus in one sentence**
- 12. List the 4 steps to entering the Focus system**
- 13. State which 2 options off the Debt Menu are most important to credit controllers.**

UNIT 9

- 1. List 5 steps in checking customer suitability for a new account.**
- 2. State one system you might use to check customer suitability.**

- 3. Define the term CBA in one sentence.**
- 4. Define the term unused account no. tab. in 1 or 2 sentences.**
- 5. Define CFUF including 2 of its functions in 1 or 2 sentences**
- 6. State the virtually standard last line, 6 figures, of the CFUF (manual).**
- 7. List the 5 steps in entering the CFUF system**

APPENDIX XI (Results)

Appendix XIa: Spare time available for study.

(n=128)

Hours	Frequency	(%)
less than 5	24	(19)
5-10	76	(59)
11-15	17	(13)
16-20	7	(6)
21-25	4	(3)

Appendix XIb: When subjects prepared to study.

(n=128)

	Frequency	(%)
During the week	62	(48)
At the weekend	28	(22)
Both week and weekend	38	(30)

Appendix XIc: Time subjects would study.

(n=128)

	Frequency	% (% Week)	(% Weekend)	
Morning (before midday)	10	8	7	15
Afternoon (between 12-5pm)	10	8	7	23
Evening (after 5pm to 10pm)	70	54	71	39
Night (after 10pm)	10	8	11	8
Both evening and night	28	22	4	15

Appendix XIId: Anticipated study environment.

(n=128)

	Spare frequency time		Work frequency time	
At home only	60	77	39	50
At work only	17	22	37	49
At home and work	4	5	6	7
In educ. instit. only	10	13	11	14
At home and educ. instit.	6	7	5	6
At work and educ. instit.	3	4	2	2

Appendix XIe: Concern whilst studying at home in spare time.

(n=128)

	<i>"very concerned"</i>			<i>"not at all ..."</i>	
	1	2	3	4	5
Noise	24(19%)	45(35%)	24(19%)	27(21%)	8 (6%)
Interruptions	22(17%)	41(32%)	22(17%)	27(21%)	16(13%)
Domestic resp.	32(25%)	32(25%)	29(23%)	27(21%)	8 (6%)
Prof. resp.	12 (9%)	36(29%)	41(32%)	12 (9%)	27(21%)
Facilities	22(17%)	39(30%)	31(24%)	14(12%)	22(17%)

Appendix XI^f: Concern whilst studying at home during work time.

(n=128)

"very concerned"

"not at all ..."

	1	2	3	4	5
Noise	16(13%)	32(25%)	8 (6%)	36(28%)	36(28%)
Interruptions	19(15%)	41(32%)	9 (7%)	30(24%)	29(22%)
Domestic resp.	19(15%)	15(12%)	30(23%)	31(24%)	33(26%)
Prof. resp.	10 (8%)	41(32%)	32(25%)	13(10%)	32(25%)
Facilities	10 (8%)	40(31%)	32(25%)	14(11%)	32(25%)

Appendix XI^g: Concern whilst studying at work in work time.

(n=128)

"very concerned"

"not at all ..."

	1	2	3	4	5
Noise	40(31%)	33(26%)	31(24%)	16(13%)	8 (6%)
Interruptions	43(34%)	43(34%)	25(18%)	11 (9%)	7 (5%)
Domestic resp.	11 (9%)	8 (6%)	41(33%)	15(11%)	53(41%)
Prof. resp.	39(30%)	37(29%)	29(23%)	10 (8%)	13(10%)
Facilities	12 (9%)	29(23%)	39(30%)	19(15%)	29(23%)

Appendix XI^h: Learning styles and studying in spare time.

(n=128)

	Home	Office	Educational instit.
ACCOMMODATOR(n=40)	32(80%)	-	8(20%)
DIVERGER (n=16)	10(63%)	4(25%)	2(12%)
CONVERGER (n=55)	31(57%)	15(27%)	9(16%)
ASSIMILATOR (n=16)	13(81%)	3(19%)	-

Appendix XIi: Learning styles and studying in work time.

(n=128)

	Home	Office	Educational instit.
ACCOMMODATOR (n=40)	22(55%)	10(25%)	8(15%)
DIVERGER (n=16)	6(37%)	4(25%)	6(37%)
CONVERGER (n=55)	13(24%)	33(60%)	9(16%)
ASSIMILATOR (n=16)	9(56%)	7(44%)	-

Appendix XIj: Concern felt by subjects who studied package at home.

(n=31)

	<i>"very concerned"</i>			<i>"not at all ..."</i>	
	1	2	3	4	5
Noise	2 (6%)	3(10%)	5(16%)	10(32%)	11(36%)
Interruptions	3(10%)	2 (6%)	5(16%)	10(32%)	11(36%)
Domestic resp.	6(19%)	3(10%)	2 (6%)	3(10%)	17(55%)
Prof. resp.	5(17%)	2 (6%)	5(16%)	5(16%)	14(45%)
Facilities	6(20%)	2 (6%)	3(10%)	11(35%)	9(29%)

Appendix XIk: Concern felt by subjects who studied package in office.

(n=27)

	<i>"very concerned"</i>			<i>"not at all ..."</i>	
	1	2	3	4	5
Noise	6(22%)	11(41%)	4(15%)	6(22%)	-
Interruptions	6(22%)	13(48%)	4(15%)	-	4(15%)
Domestic resp.	-	-	6(22%)	4(15%)	17(63%)
Prof. resp.	-	17(63%)	-	6(22%)	4(15%)
Facilities	6(22%)	-	9(33%)	4(15%)	8(30%)

Appendix XII: Concern felt by subjects who studied package in study room in office.

(n=15)

	<i>"very concerned"</i>			<i>"not at all ..."</i>	
	1	2	3	4	5
Noise	-	-	1 (7%)	4 (27%)	10 (67%)
Interruptions	-	-	1 (7%)	1 (7%)	13 (86%)
Domestic resp.	-	-	1 (7%)	3 (20%)	11 (73%)
Prof. resp.	-	10 (66%)	-	4 (27%)	1 (7%)
Facilities	4 (27%)	-	6 (39%)	1 (7%)	4 (27%)

Appendix XIII: Comments on the package.

(n=61)

	<i>"very..."</i>			<i>"not at all..."</i>	
	1	2	3	4	5
Interesting	3 (5%)	11 (18%)	28 (45%)	16 (27%)	3 (5%)
Easy	8 (12%)	13 (21%)	25 (44%)	10 (17%)	5 (8%)
Enjoyable	-	15 (25%)	26 (42%)	15 (25%)	5 (8%)
Convenient	8 (12%)	22 (38%)	10 (17%)	13 (21%)	8 (12%)

Appendix XIn:Comments on the package.

(n=61)

	<i>"very..."</i>			<i>"not at all..."</i>	
	1	2	3	4	5
Bulky	11(18%)	18(30%)	13(21%)	13(21%)	6(10%)
Easy to follow	22(36%)	20 (3%)	13(21%)	3 (4%)	3 (5%)
Easy to dip into	3(5%)	23(37%)	13(21%)	11(18%)	11(18%)
Pleasing to look at	3(5%)	27(44%)	20(33%)	8(13%)	3 (5%)

APPENDIX XII (Raw data)

Subject	Gain score	Learning style
1	39	Ac
2	51	C
3	28	As
4	52	C
5	50	C
6	52	C
7	57	C
8	9	Ac
9	19	Ac
10	48	C
11	51	C
12	11	D
13	29	C
14	28	C
15	52	C
16	51	C
17	38	C
18	34	Ac
19	19	Ac
20	51	C
21	52	C
22	57	C
23	38	C
24	39	C
25	51	Ac
26	33	Ac
27	47	C
28	32	C
29	46	Ac
30	27	C
31	40	Ac
32	11	Ac
33	31	C
34	51	C
35	16	Ac
36	16	As
37	30	C
38	16	Ac
39	49	C
40	45	Ac
41	40	C
42	49	C
43	46	C
44	50	C
45	4	C
46	27	C
47	46	Ac
48	5	As
49	24	C
50	24	Ac
51	24	Ac

APPENDIX XII

Subject	Gain score	Learning style
52	15	Ac
53	39	C
54	48	C
55	6	C
56	12	Ac
57	26	Ac
58	32	Ac
59	24	C
60	20	C
61	8	Ac

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