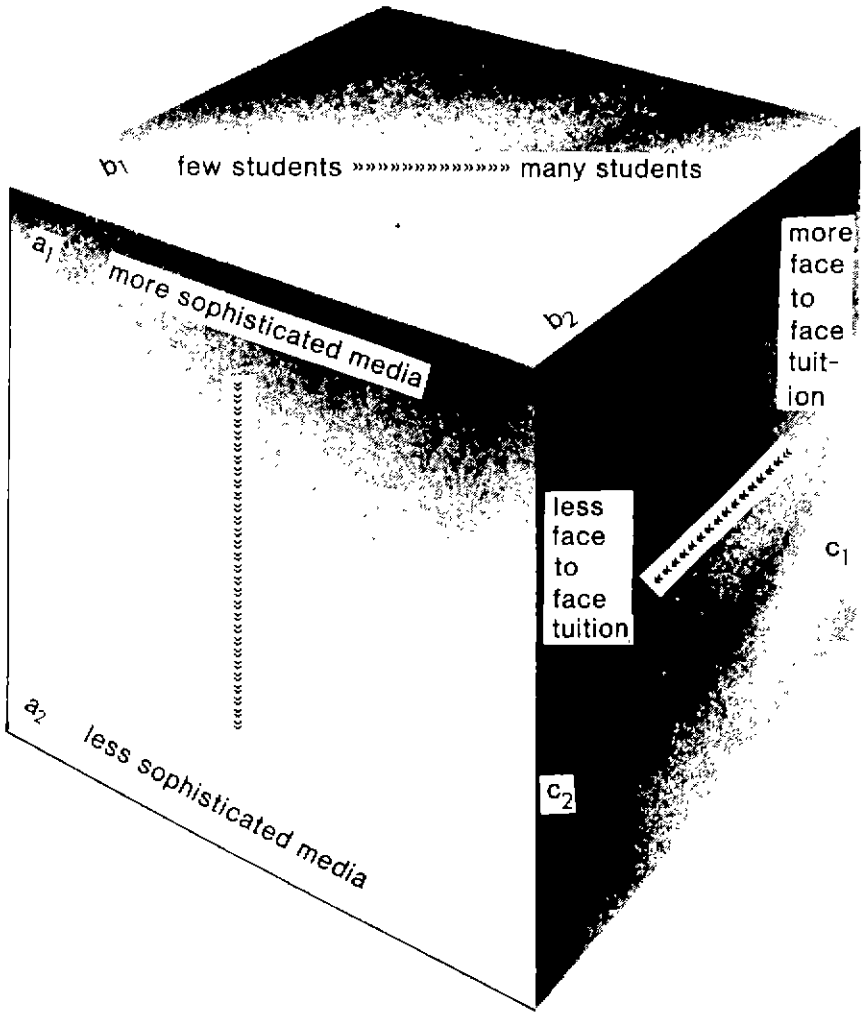
FernUniversität
Gesamthochschule

ZIFF PAPIERE 67

Hilary Perraton

The roles of theory and generalisation in the practice of distance education

Three related systems for analysing ditance education



Follow »»»»»»»»»»»»»»»» to reduce the cost per student

Zentrales Institut für Fernstudienforschung
Hagen, Oktober 1987

Autor: Dr. Hilary Perraton
Chief Project Officer / Education Programme
Commonwealth Secretariat
Marlborough House, Pall Mall, London SW1 Y 5HX

Herausgegeben von Helmut Fritsch
Redaktion: Helmut Fritsch, Frank Doerfert, Helmut Lehner
Zu beziehen über FernUniversität, ZIFF,
Postfach 940, 5800 Hagen

Summary

Theory is seen as being of value to distance education where it can help solve problems. While there are advantages in taking a narrow definition of theory, generalisations from experience may also be of value both in solving problems and as a first step towards the development of theory. Distance education is examined in terms of three related systems, concerned with teaching, with administration and with assessment. Theoretical statements are made in discussing teaching and concern the use of media, the role of feedback and face-to-face tuition, and the development of teaching materials. In the administrative system generalisations, which can guide practice, are made about the classification of audiences for distance education, about the governing structure of distance-teaching institutions and about their functions. The assessment system demands the use of a battery of measures to examine distance education from the standpoint of its performance, as measured by its effects on its students, its adequacy in relation to the total amount of need, its efficiency, and its process, requiring an examination of the quality of the educational process itself. While all four standpoints are important, theoretical statements are made only about efficiency and the assessment of process has been relatively neglected in the literature. The assessment system requires the use of value judgments with values, on which universal agreement cannot be expected, that are derived from social and political philosophy.

Zusammenfassung

Für das Fernstudium wird Theorie dann als hilfreich angesehen, wenn es ihr gelingt, bei der Problemlösung behilflich zu sein. Während eine enge Definition von Theorie von Vorteil ist, liegt der Wert von Generalisierungen aus der Erfahrung heraus sowohl in der Problemlösung als auch im ersten Schritt zu einer Theorieentwicklung hin. Fernstudium wird im folgenden unter drei miteinander verknüpften Systemaspekten betrachtet: den Systemen der Lehre, der Verwaltung und der Erfolgskontolle. Für die Theorie des Lehrens relevante Aussagen werden zu folgenden Bereichen gemacht:
- Verwendung von Medien
- die Rolle von Feedback und Direktunterricht im Fernstudium
- die Entwicklung von Lehrmaterial
Für den Aspekt der Verwaltung werden praxisanleitende Generalisierungen gemacht über:
-Struktur von Fernstudien-Institutionen
-hauptsächliche Funktionen
Das System Erfolgskontrolle erfordert die Verwendung einer ganzen Reihe von Massnahmen, um das Fernstudium vom Standpunkt der Qualität seiner Durchführung zu überprüfen :
- gemessen an seinen Auswirkungen auf die Studenten
- die Befriedigung einer bestehenden Gesamt-Nachfrage
- seiner Effizienz
- seiner Durchführung;
all diese Kriterien bedürfen auch der Betrachtung des Bildungsprozesses als solchem. Während diese vier Kriterien wichtig sind, muß gleichwohl festgestellt werden , dass hier theoretische Aussagen im eigentlichen Sinne in der Literatur zum Fernstudium ziemlich selten vorkommen und dann auch nur die Effizienz und die Überprüfung des Lernerfolgs betreffen. Das System Erfolgskontrolle erfordert nämlich den Verweis auf Werturteile, über die ein Einvernehmen allgemein wohl nicht erzielt werden kann: Vorannahmen aus der sozialen und politischen Philosophie.

Contents

	Page
Introduction	1
The teaching system	3
The administrative system	8
The assessment system	11
Conclusion	18
Figures	19
Notes	20
References	21

Introduction

I'd like to start by putting my philosophical cards on the table, setting out the assumptions that lie behind this paper. I do this not only as a necessary foundation for it but also because these are not what I want to talk about today.

To begin with, my interest is in solving problems and I see the role of theory as one of helping to solve problems. The fundamental problem lying behind the paper is this: 'how can we best enable people to learn at a distance?'.

Next, I see merit in taking a narrow view of theory in the sense of, 'a set of hypotheses related by logical or mathematical arguments to explain and predict a wide variety of connected phenomena in general terms' (Urdang 1979), seeking theories that can be falsified, and that allow predictions'. While the acceptance of this narrow, Popperian, meaning of the term places limits on what we can class as theory, it makes any theoretical statements we do accept that much more powerful. At the same time we need to avoid what Lakatos calls 'naive falsification' and instead seek 'sophisticated methodological falsificationism'; the hope is not to find a single refuting example to set against any theoretical proposition but from any such examples to build a 'new theory [which] has some excess empirical content over its predecessor, that is, ...it predicts some novel, hitherto unexpected fact' (Lakatos 1978, p.33).

As we cannot - or I cannot - develop theoretical statements about all the interesting problems in distance education I also see merit in seeking generalisations that fall short of theory. I borrow this distinction from Runciman's (1983) discussion of the relations between theory, generalisation and practice in the social sciences which rests on an analysis of the nature of understanding. He distinguishes between three meanings for the term 'understanding'. In its first sense, understanding answers the question 'what is happening?' and, in his terminology, concerns reportage. In the second sense understanding demands an answer to the question 'why?' and is concerned with explanation. In the third sense it involves answering the question 'what is it really like?' and so requires description. Thus, if we examine a picture of Latin American students of a radio school, learning with their their texts and their radio, we can ask 'what is happening?' and expect reportage, such as an

observing newspaper reporter might give. If we go on to ask 'why' we may get a range of answers, some concerned with the sociology of Latin America and some, our major concern here, explaining why people can learn at a distance. We may, however, want a different sort of account and seek the detailed description that alone can tell us 'what is it really like' to be the campesino student we see in the picture.

Runciman goes on to claim that in its first sense, in the realm of reportage, we can produce generalisations but not theories; when we ask 'what is happening' we are not asking a question that leads directly to theory. It is only in the second sense of the term 'understanding', where we are seeking explanation, that we can develop falsifiable and predictive theoretical statements. I will, however, argue that we can legitimately derive heuristics, or rules of thumb as a guide to practice, from generalisations as well as from theoretical statements and also that the development of generalisations out of reportage can be the first step towards the development of theory.

One final philosophical view and we can get back to distance education. I see education as being multi-faceted and find Stenhouse's categorisation particularly useful. He distinguished between four types of educational activity: training, where we are concerned with skills; instruction, where we are concerned with information; initiation, where people are being initiated into social norms; and induction, where people are being introduced to thought systems enabling judgment (Stenhouse 1975, p. 80ff). If we are to solve problems in distance education - in helping people learn - then we may need to concern ourselves with all four types.

Enough of philosophy and presuppositions. The problem that sparked off the paper was more modest than my broad concern with the problems of learning at a distance. It derives from work I did at the International Extension College with the University of London Institute of Education when we were seeking a structure for teaching an MA course on distance education that would be coherent and would help towards identifying generative concepts (cf Bruner 1962, p. 121). The structure proposed here served that purpose and may also be of value in helping with the practice of distance education.

To provide a structure for analysing some of the interesting problems of distance education and so seeking answers to the starting question, we can examine distance education in three ways, analysing learning at a distance, analysing the administrative structure which it needs, and analysing the methods of assessment which lie behind, and permit, answers to the question. We can regard this process as one of examining three systems which are related as in figure 1. In examining the teaching system we know that there is a black box labelled 'administration' which we do not examine at this stage, and a further black box labelled 'assessment' which contains within it certain presuppositions and techniques which we use in analysing learning without examining them. Similarly, in examining the process of administration in distance education we treat as black boxes both the assessment system and the teaching system which were previously the focus of our attention. And, in looking at assessment, we do not examine in detail the learning and administrative issues examined in the other two systems.

The teaching system

In discussing teaching, we can start with a broad question such as 'how do people learn at a distance?'. Theories are of value if they can answer such questions as, 'what sort of media should we use? how much face-to-face learning is necessary? how do we design materials?'. This paper does not develop a fully fledged set of answers to such questions; rather the aim is to suggest the kind of answers that we can expect to them and so the kind of theory that it is useful to seek.

Research on learning, much of it laboratory based, has often produced statements which suggest that process (x) leads to more effective learning than process (y). The five theoretical statements about distance teaching, discussed below, are of this kind; their practical value, if they are sound, is that, in this domain, we can make properly theoretical and falsifiable statements. Five such statements illustrate the kind of theory which we can expect and use as a guide in planning for effective learning.

The first statement was made in a specific form by Trenaman who compared the presentation of information through radio programmes, television programmes and

print, examining differences between the media and between the backgrounds of the adult learners who were his subjects. He classified them in terms of their education and types of occupation, grouped together in 'occupation grades'. He found that,

> The outstanding feature of the analysis is that differences between one programme and another, and differences between the occupation grades are very significant indeed, and account for more variation than any differences between one medium and another.
>
> (Trenaman 1967, p.40)

This finding reflects earlier work which compared radio and face-to-face education (cf Cantril and Allport 1935 pp 171-2 and Woelfel and Tyler 1945, pp 26-7), and foreshadowed studies of television which produced similar findings of no significant difference (Chu and Schramm 1968). We can state the theory of media equivalence baldly: communications media do not differ in their educational effectiveness.

In making the statement, it is assumed that the term 'educational effectiveness' leaves out of account questions of motivation which we consider below. Thus one might expect the theory to be developed further by reference to differences between individuals in their preferred method of learning and in their interaction with different communications media, or perhaps by reference to different types of learning.

The practical importance of the theory is, as Chu and Schramm forecast, in liberating the educator to choose a medium according to the convenience and needs of the learners, and in response to the costs of the alternatives.

The next theoretical statement might seem to be in conflict with the first. It claims that distance-teaching programmes which use a combination of media are likely to have a higher successful completion rate than those which use a single medium. The contradiction is more apparent than real as different combinations of media may have differing effects and different media can affect motivation, as opposed to learning, differently. Moreover, 'short of an absolute science of learning and instruction ... some justification exists for a "shot gun" approach. To the extent that our choices of media are faulty, use of several media in redundancy may be to some extent justified' (Briggs et al. 1967, p.14). The practical advantages of combining broadcasting with print and with face-to-

face learning was a starting point both for the National Extension College and for the Open University. The reasons for it lie in the power of broadcasts to stimulate, the power of face-to-face tutoring to relate subject matter to individual response, and the power of print to give permanence. And yet, we remain short of hard empirical evidence to add weight to the theoretical statement and further data to refine the theoretical statement would be valuable

Theories of distance education need to consider broader issues than the choice of medium; among these are the roles of two-way communication. Such two-way communication has at least five functions: to encourage, to correct errors, to signal difficulties on the part of the learner, to inform those who prepare educational materials, and to allow learner and teacher to take off in directions which had not been forecast. This last capacity is, for many educators of unique value and importance, lying at the heart of the educational process if it is to be worthy of the name[2]; the term 'value' reminds us that we will come back to these issues in the assessment system. In face-to-face learning all types of two-way communication may be achieved at about the same time, and using the same channel. In distance education, in contrast, we may need to organise different channels of communication for these different purposes.

Feedback in distance education, carried by one channel or another, generally takes one of two forms; it is either impersonal and immediate or personal and delayed. You may find the answer at the back of the book, or in thirty seconds time from the radio tutor, or you may get an individual response from your tutor after a delay of some days or weeks[3]. The evidence for the success of distance education, such as it is, confirms that a combination of the two types of feedback can lead to effective learning, although the last of the functions identified is more difficult to achieve than in face-to-face education. The success is qualified, too, in that delays in feedback can inhibit learning (cf Rekkedal 1983, p.217). We could thus sum up that a combination of immediate and delayed feedback can lead to effective learning but there is a significant negative correlation between measures of effective learning and the length of the delay. From this statement we would like to derive more precise and limited ones, about the circumstances under which delay and impersonality are more or less important. It seems reasonable to assume that there will be a

contrast between different subjects, or different kinds of educational activity, and more precise statements are needed to help, for example, with the design of effective teaching in mathematics as compared with languages.

The next theoretical statement claims simply that face-to-face tutoring, or an alternative form of simultaneous two-way communication, increases the effectiveness of distance education. Again, the statement could usefully be refined, perhaps towards suggesting that the need for face-to-face tuition varies inversely with the motivation and sophistication of the learners, but this will advance us significantly only if we can put some quantities to the terms 'motivation' and 'sophistication'. As it stands, the statement seems to be in accordance with the evidence and can serve as a starting point for more detailed and practical discussion about tutorial work. When coupled with statements about the cost behaviour of distance education it takes us to the heart of the distance educator's dilemma: how to reconcile the educator's demand for more and more face-to-face contact with the populariser's desire for ever larger audiences and the budget controller's desire for ever lower unit costs.

So far we have been concerned with broad issues about the role of various media in teaching at a distance and the significance of two-way communication. There remain, however, problems of instructional design: how do we ensure that printed materials, or broadcasts, are effective. Here there is a considerable literature whose significance is, in part, that it has generated theoretical statements of these kinds:

> 'personification, dramatisation and a story form, then, assist understanding at the lower levels' (Trenaman 1967, p.109);

or, on teaching by radio,

> 'reinforcement by being informed of the results increases the rate of learning. (In most cases the radio teacher asks the children to give oral or written responses, and immediately thereafter gives them the correct answer)' (Galda and Searle 1980, p.4).

Holmberg (1985) has put a number of statements of this kind, on both course design and tutorial support, into a theoretical context. But far more of the literature is in the form of practical guidance on writing or making broadcast programmes rather than of theoretical statements. Many institutions have produced their own internal guides to course development and there is now a

considerable number of more general guides (e.g. Holmberg 1960, Perraton 1973, Romiszowski 1981, Bååth 1983). In some cases the advice given is severely practical and, while based on empirical evidence and on hunches of what works effectively, is not placed in any theoretical context. In other cases writers have tried to relate the particular of writing correspondence courses to the general views of educational theorists such as Ausubel or Gagné. From the literature one can derive a variety of properly theoretical statements which respond to the problem of students' need to learn in isolation from tutor or peers. The statements are in such forms as these:

'the presence of advance indicators in the text increases learning';

'the use of the first and second person and the active voice makes a text more accessible to students than the use of the third person and the passive';

'organisation of the subject matter in a coherent structure which takes account of the learner's previous knowledge increases learning'.

International Extension College (1979) and Bååth (1983) are useful practical guides which give rise to statements of this kind.

This is not the place to summarise the literature. It is, however, important for the general argument to show that theoretical statements of the kind which appear in it can be subsumed in a general statement that learning at a distance can be made more effective by the use of presentational devices within the text and by a coherent structure of the subject content. As with the previous theoretical statements this does not, in itself, take us very far. Rather it stands as an overarching theory on which others, that are more immediate guides to practice, can depend.

The point, then, of developing these five theoretical statements about learning is to suggest a way forward, in which more detailed theoretical statements of the same kind are generated, that respond to the problems of our learners. The ease of generating such statements is, as will be shown, a contrast with the administrative system where it is far more difficult to go beyond generalisation.

There are, however, four difficulties in using the theoretical statements as they stand as a guide to solving the problems of designing effective distance education. The first has been touched on already: they are too broad and general and it is their narrower descendent theories that are more important. Second, we cannot consider them in isolation from the administrative issues, and need to ask what is administratively feasible as well as what is desirable for effective learning. Third, they depend also on issues of assessment, if only to reach agreement on what we mean by increased learning or effectiveness. Fourth, the discussion so far has been too simplistic, and has seemed to assume that there is a single, simple, entity called 'learning'. In practice, differences between types of learning mean that an adequate theory needs to specify what type of learning is being considered if the theory is to be any actual use as a guide to practice. A challenge for practice and for theory is to consider ways in which distance education can be effective not only in training and information but also in initiation and induction.

The administrative system

I want to touch on administration very briefly and do so with two aims: to show how it relates to the other two systems and to suggest that it is a domain in which we are limited to generalisation and have not developed theories[4].

An opening question for the analysis of administration in distance teaching and for solving practical problems is, 'what administrative structure is necessary to ensure learning at a distance?'. To begin answering it the administrator will need to consider the nature of the institutions's audience, examining it in terms of variables such as social and educational background, location, age, sex and occupation. It is then useful to classify administrations in terms of their structures and their functions. Classifications of this kind are of limited value simply because they are no more than generalisations from reportage of administrative practice. But they may help us in making for better informed decisions about creating or developing distance-teaching institutions[5], identifying areas of possible conflict.

We can classify distance-teaching institutions in terms of their governing structure, distinguishing four main types of model: [6]

1 autonomous institutions concerned just with distance teaching (e.g. the British Open University);

2 semi-autonomous institutions (e.g. the Lesotho Distance Teaching Centre which is responsible to the ministry of education but was established with some autonomy);

3 departments of larger organisations where there is a department responsible for distance teaching alongside other departments. We can subdivide this group in four ways:

3.1 departments concerned with a single subject only (e.g. College of Estate Management of the University of Reading);

3.2 wider ranging departments which have their own administrative and teaching staff (e.g. University of Wisconsin Extension);

3.3 departments which have both administrative and educational staff concerned with distance teaching but rely on their parent institutions for subject specialists rather than employing their own (e.g. Department of external studies at Murdoch University);

3.4 departments which have administrative staff only and where pedagogical as well as subject specialist expertise rests with the parent body (e.g. University of New England and University of Zambia).

4 co-operative structures where different parts of the process of distance teaching are carried out by separate but co-operating institutions (e.g. FlexiStudy in Britain)[7].

The models are set out in order of declining autonomy. As we move from class 1 to class 4, so the institution has less independent control over its educational work. While a fuller examination of the concept of autonomy might take us towards an administrative theory this more modest set of categories makes it possible for the educational planner to generalise and to compare the merits of alternative governing structures for a particular educational purpose. It thus provides a framework for decisions about, for example, the advantages of model 3.2 as against 3.4. To caricature the argument, you can seek to recruit teachers truly dedicated to the needs of external students in model 3.2 but in model 3.4 you can ensure that external students are taught by as distinguished academics as internal students and not just by extramural tutors. We can also see that conflicts between editors or course designers, for example, and

subject-matter specialists will take a different form within different administrative models, and require different structures to resolve them.

The concept of autonomy is useful, too, in examining the internal functions of a distance-teaching institution, our second way of categorising within the administrative system. Here, it can illuminate questions about the control of an institution's various functions.

We can distinguish seven functions, although some institutions will have fewer than this number where others are assumed by their parent organisations or by other bodies. Most will have the first five:

the development and production of teaching material, or the ability to acquire it from elsewhere;

storage and distribution;

tutoring, counselling and arranging feedback from students;

a record system (of students, tutors, materials, processes);

a financial system.

Many institutions will also have:

a recruitment structure to attract and inform potential students;

a capacity for research and evaluation.

The way these functions are exercised, and the internal administrative structure required to control them, are determined or at least influenced by the governing structure of a distance-teaching institution and by the nature of its audiences. A fully autonomous institution like a Latin American radio school, for example, requires an administrative structure with all seven functions. An institution with a similar administrative model but without its own radio station will need rather less developed forms for some of the functions: it will not need its own radio transmitter. But its reliance on another organisation's transmitter will create the need for a structure for co-operation with those running the radio station. As a generalisation we can argue that the more autonomous an institution, the greater are the administrative burdens which fall on its own staff while, the less autonomous it is, the more it requires administrative structures for co-operation with other agencies. By using classifications of

this kind the planner can examine alternative ways of meeting a distance-teaching institution's administrative needs. It is possible then go on to examine the location of different functions or activities and identify where conflicts of interest will arise as a consequence of such location.

Such generalisations, even though they are short of theory, can be of value, then, in identifying administrative issues which the project planner or distance-teaching administrator needs to address. But, in using them we are constantly driven back to the teaching system, asking, 'will this administrative change help or hinder people's learning?' and on to the assessment system, asking, 'are the social and educational consequences of this decision desirable or undesirable?'.

The assessment system

The development of policy for learning or administration is not neutral: in analysing policies we have repeatedly been forced into making value judgments. To complete the picture of distance education we need therefore to ask about its quality and about the criteria by which we will assess that quality. In doing so we undertake two distinct activities, determining the values by which we will judge an educational programme and using these values in making an assessment. Although the first of these activities lies within the domain of social or political philosophy, the second does lend itself to theoretical statements; once we have agreed on the value judgments to be used then it should be possible to say, on the basis of comparative research, that programme (a) is likely to achieve more favourable results than programme (b).

All of this is equally true for the evaluation of conventional education.

In this domain we can begin by asking, 'is a particular distance-teaching programme any good?' and seeking indicators of educational quality which, if at all possible, permit quantification. (Even if we eschew quantification we may want to ask as difficult questions about the presence or absence of a quality we value.) The search for quantification is a painful one for educators concerned about qualities that are not easily measured. While there are no easy solutions, some of the disadvantages of a narrow quantification can be avoided by using a battery of different measures.

This paper does not take a stance on methodology or review the extensive literature on educational evaluation. In the light of the literature it is, however, possible to propose a framework for evaluating distance education with an appropriate battery of measures. Following work done by McAnany (1975, pp240-1) in evaluating radio schools four criteria are proposed: performance: the effect that the programme has produced among its target population; adequacy: the degree to which effective performance is adequate to the total amount of need; efficiency: the ratio of input to output or effort to effect; process: an assessment of the quality of the education as an activity in itself[8].

Much of the assessment and evaluation of distance-teaching programmes and institutions that has been carried out can be examined within this framework.

Two measures of internal efficiency have been widely used to examine performance. The first is a measure of learning, often using examination pass rates as an indicator. A measure of this kind is, of course, more easily applied in formal programmes leading to paper qualifications than in nonformal education and has been widely used for such programmes. Sheath (1965), and Jevons (1982), for example, have used this kind of measure in examining the performance of distance and conventional students at Australian universities. Tests of knowledge gain have, however, also been used in assessing more nonformal programmes, such as the Tanzanian health campaigns (cf Hall 1978) or Ghanaian farm forums (cf Coleman and Opoku 1968). The second measure is of the successful completion rate; if we are satisfied that completing a course will produce the intended effect in a target population, then this is an acceptable indicator of performance[9].

It is much more difficult to determine appropriate external measures that will indicate the adequacy of our work. There is some experience in evaluating nonformal courses by reference to the effects they had on people's everyday life, through changes in their health or agricultural practice, as opposed to tests of their knowledge of health or agriculture. The Basic Village Education Programme in Guatemala did this in relation to agriculture; there have been attempts to do it in relation to health campaigns in, for example, Latin America, California, the Philippines, and Tanzania[10]. But these, and a handful of others, are rare exceptions to a general rule that the cost and technical difficulty of

attributing social effect to educational cause prevent direct measures of adequacy.

It is not much easier to develop measures of adequacy in relation to formal courses. The difficulty is not, of course, peculiar to distance education. Many evaluations in practice use proxy indicators which are an appropriate measure of adequacy only if we are already satisfied that the educational programme is a useful response to a public educational need. Once this assumption is made, one simple method of assessment is to ask about the audience reached by a distance-teaching programme, in terms of its wealth, or educational background, or location - all issues which were touched on in considering administration. There is a rich lode of research that has been mined by the Open University here (cf, for example, McIntosh, Woodley and Morrison 1980). Comparison with other programmes is made possible by such research, but it is still seldom easy to determine the size of the potential need against which a programme should be assessed.

Another possible measure is the rate of return, or an attempt to measure in financial terms the benefits which arise from having gained a qualfication through distance learning. Following analysis of rates of return for education more generally (cf Psachoropoulos 1973 and 1980), Mace (1978), for example, has used this principle in an attempt to compare the value of the British Open University with conventional universities''. A further possible external measure of the status of a distance-teaching institution is the extent to which its qualifications, or its graduates, are accepted by other and more conventional institutions. This would seem most appropriate if a programme had as one of its major aims the production of future scholars.

Despite the difficulties, measures of performance and adequacy do make possible the kind of theoretical statements already made in the discussion of the teaching system. Theoretical statements are also possible when we move to examining the <u>efficiency</u> of distance education. Cost-effectiveness analysis is one possible technique. If we accept that measures of performance such as examination pass rates are acceptable indicators, then it is legitimate to ask whether distance teaching or conventional teaching is a cheaper or dearer way of achieving the same result. There are often practical difficulties in that cohorts of students in the two modes are not similar. And the quality of the

cost-effectiveness research has been criticised by Carnoy and Levin (1975) who argue that much of it displays a 'benefit of the doubt' bias in favour of distance education. Nevertheless, enough work has been done in analysing costs for us to seek theoretical statements here.

Distance teaching would seem, on the face of things, attractive to financiers of education because it promises economies of scale, allowing educational resources to go further than is possible with conventional education and a measure of capital-labour sustititution. (cf. Jamison and Orivel 1982, p. 255). We would therefore expect theoretical statements about the economics of distance education to concern themselves with such substitution. As the cost of producing materials and administering a distance-teaching service are additional to the costs of running an ordinary school system we can claim that, where distance teaching includes some face-to-face teaching, if in a distance-teaching system the costs of face-to-face support rise to the level of those in conventional education, then the costs of distance teaching cannot compare favourably with those of the conventional system.

We can go at least one stage further in the analysis. Assuming that we define 'favourable economic outcome' of distance education as a success rate at costs lower than those achieved by conventional education, then we can argue that a favourable economic outcome for any one distance-teaching course is a function of three factors, the number of students, the amount of face-to-face study and the sophistication of the media used. Figure 2 shows this in diagrammatic form. It enables us to define a surface $(a_{\leq}, b_{\geq}, c_{=})$ at which unit costs are the same for conventional and for distance education.

While we lack the data to put monetary values, in all but a few cases, on the building bricks which make up the block in figure 2, its existence and the theoretical argument behind it, may serve as a guide both to data collection and to planning. The figure illustrates, too, the need for the three systems of analysis and the relation between them: as a guide to administrative planning it needs advice from the teaching system about the sophistication of the teaching media needed for a particular audience and subject, and about the role of face-to-face learning, while it needs to be informed by the assessment system about trade-offs such as that between the numbers to be reached and the amount of face-to-face learning permitted.

Assessing process, with necessary questions about the quality of the educational experience as opposed to its performance, adequacy or efficiency, is more difficult and more controversial. I would, however, argue that we need to go on and ask how far the process of learning at a distance is, in itself, rewarding for the learner, or how far it is merely a dreary means to an end, justified because of the value of the objectives but not justified through its intrinsic worth as a human activity.

Indeed, I would go on to claim that evaluation of process has been comparatively neglected and that there are reasons to play it up which spring from the nature of distance education. For distance education faces the danger that it will encourage rote learning, will rely on extrinsic rather than intrinsic rewards, and will deprive its students of some of the most valuable parts of the educational process. We know that distance education is an effective way of conveying information but at the same time that, with its necessary reliance on the written text, it can easily degenerate into rote learning. Kirk, for example, has suggested that the greatest intellectual benefits of the Open University go to the writers of courses rather than the students and warns of 'the danger of a mass-produced student product which is of inferior calibre to that of conventional universities' (Kirk 1975, p.4). A concern for process can help us keep asking questions about distance education's value for induction and initiation as well as for the transfer of information or the training in skills.

An excessive reliance on extrinsic rewards is not inherent to distance education. But in practice the widespread use of an objectives-led model of course development may lead towards this and towards the dangerous assumption that what is easily assessed is necessarily worth learning. In contrast, as Stenhouse has argued,

> The aim, 'to understand Hamlet', is not susceptible of analysis in terms of content elements. Here, 'understanding' means to respond to or experience the concrete reality of a work of art. The response or experience is individual, though there are canons by which we can judge its appropriateness, by which one can discriminate understanding from misunderstanding. It might be tempting to couch objectives in terms of these canons, adopting as an aim 'to develop literary judgment'; but it seems to me that this aim cannot be analysed into pre-specified student behaviours in any way. ... To use the play as a vehicle for teaching skills is to imply - and students rather readily pick up the implication - that the skills and vocabulary and so forth are the important matter rather than the play.
>
> (Stenhouse 1971, pp 75-6)

It is because of the neglect of process that the most formidable challenges can be mounted against distance education as offering the shadow rather than the substance of education. But I have one further reason for stressing the evaluation of process: because it is something under our control. If our concern is with the external value of our work, or of the extrinsic benefits that our students will derive from it, then we may well get it all wrong, teach our students things that will in practice be of little benefit to them and, because of the difficulty of disentangling the effects of our work from those of other variables, never realise what we have done. In assessing process, on the other hand, we are not concerned with future benefits that our students may obtain, but with the value of the work they are doing while they are our students.

The evaluation of process is thus a necessary part of the assessment system. It is also the part where the literature gives the least help in suggesting how we should do it: another feature which is common to the evaluation of conventional education. The link between it and the assessment of adequacy suggests that it is legitimate to talk of a system of assessment with necessary interrelationships between its constituent elements. By using a combination of the measures and indicators discussed in this system we can seek to make some assessment of performance, adequacy, efficiency and process, although there remain methodological challenges for us here, especially in the evaluation of process.

Especially in discussing process, I have strayed from discussing the techniques of assessment into a discussion of the values I would choose and use in making an assessment. There is no escaping this. Even if we decide to use a battery of evaluative measures, we will need to seek trade-offs between conflicting goals. High pass rates, for example, may conflict with low unit costs or large and socially diverse audiences. Or we may find that we can improve our performance, as measured by examination results, by using styles of teaching that we also regard as being part of an inferior process: a familiar dilemma.

Let me therefore conclude, in the way I began, by laying my remaining cards on the table. In carrying out assessment we have to start from a political or philosophical judgment that informs our choice of priorities and of evaluative criteria. Examples from the recent history of distance education demonstrate

that agreement about the value judgments used in assessment cannot be universal. It has been claimed, for example, that one of the advantages of the Free University of Iran, in the eyes of the Shah's regime which established it, was that distance education allowed students to get degrees without gathering together, when they might pose a threat. Yet few of the published apologists for distance education see its convenience for autocratic regimes as a benefit. Less dramatic views about distance education can also be controversial; some writers have argued that a strength of distance education is that it develops a degree of autonomy in its learners[12]. But the development of the autonomous ability to learn would be an inappropriate measure for a distance-teaching activity like the Tanzanian radio campaign on health whose aim was to stimulate co-operative action by groups of villagers.

Thus the two questions proposed below about the quality of the educational process of a distance-teaching programme represent an individual view of the more important criteria for use within the assessment system. They are not posed as an alternative to the battery of measures suggested nor is it claimed that they are the only important ones. Rather they serve to illustrate the point that, while the assessment system is a necessary part of the proposed framework for analysing distance education, we cannot assume universal agreement about the criteria to be used within that system.

My two key questions are these. First, does the programme lead to open-minded enquiry and not merely to rote learning and sometimes examination success. The diploma disease can be endemic but for me is not what a liberating education is all about. Reverting to Stenhouse's categories, we need to ask how far distance education can lead towards induction and initiation and how far it is limited to instruction and training.

The second question concerns social equity. We can ask whether a distance-education programme is increasing or decreasing social equity. On the face of it, programmes of distance education which widen educational opportunity would seem to promote equity. But Bock and Papagianis (1983) have argued that some nonformal programmes are in practice, if not by design, containing educational demand rather than increasing equity. The question is not easy: by offering an inferior education (if that is what we are doing) to people outside school who might otherwise get none, we are doing something to widen educational

opportunity, even if we are not restructuring an educational system in a way which makes it more egalitarian as a whole and may be helping to legitimise a system stratified on class lines. Thus, my final question for a distance-teaching programme is to ask whether it is increasing, or has the potential to increase, social equity.

Conclusion

The argument of this paper can now be summarised briefly. While it is naive to seek a single theory of distance education, it may be useful to examine distance education in terms of three interrelated systems of teaching, administration and assessment. This examination provides a coherence that may be useful both for teaching and for the improvement of practice. In the teaching system, it is possible to make theoretical statements, using the term 'theory' in a strict and narrow sense. While the statements made here are in too general a form to be of great practical value, they suggest a way in which narrower, and more useful, dependent theories can be developed from them. In the administrative system, generalisations can be drawn from practice which may offer useful heuristics and may, in time, serve as the basis for administrative theories. In the assessment system, we need both to make value judgments about educational quality and to seek indicators of that quality. Given agreement on values, some theoretical statements can then be made about the economic assessment of distance education. But the values themselves, while being a necessary underpinning of the theories and generalisations examined, are external to them and derived from political philosophy rather than from the practice of education.

Dr Perraton is an education officer at the Commonwealth Secretariat but the views in this paper are his own and do not necessarily represent those of the Secretariat.

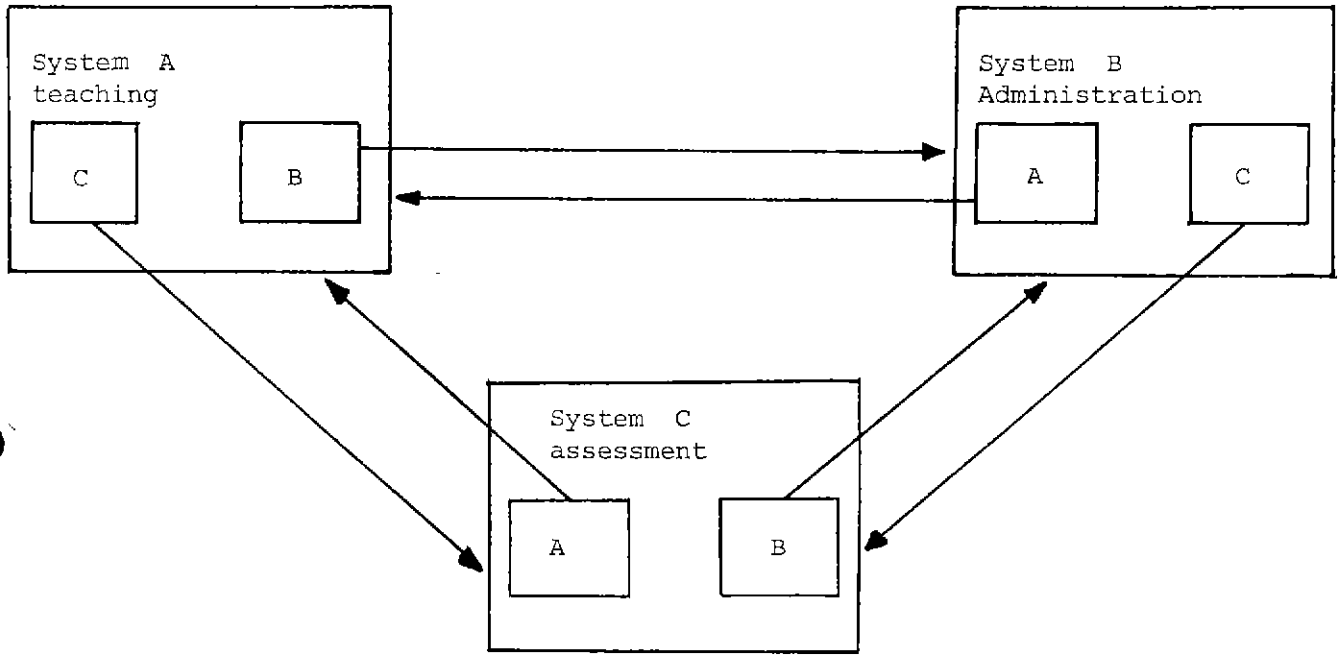


Figure 1: Three related systems for analysing distance education

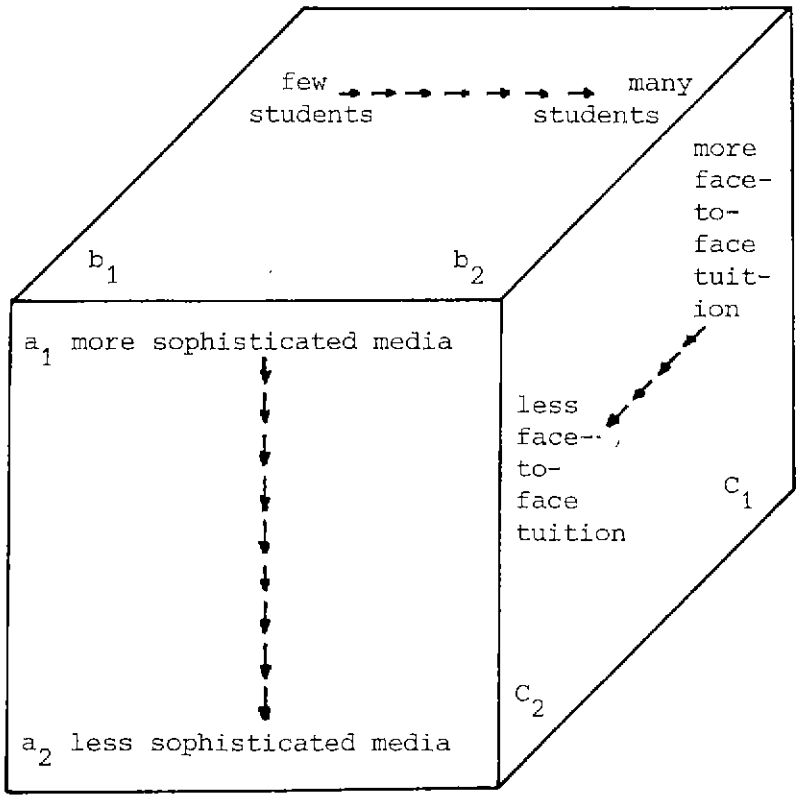


Figure 2: A model for comparing the costs of conventional and distance education

Notes

1 Using the word in this limited sense, much of the published discussion about the theory of distance education is not theoretical at all; it does not lead to refutable propositions. I would, to take one example, now argue that only part of the discussion in Perraton (1981) is strictly theoretical. I would also argue that the variety of phenomena with which we are dealing in the practice of distance education is such that it is misleading to seek a single, all-embracing, theory.

2 Peters sees this as the essential feature of higher education where 'teacher and taught ... are both participating in the shared experience of a common world' (1972, p.104). For a thinker like Freire, it is the essence of education at its most basic (cf Freire 1972).

3 There are important exceptions to this including occasional face-to-face sessions, telephone conferences and the use of satellite communication, as in the University of the West Indies UWIDITE project. But it is necessary to examine the power of distance education where such personal, immediate, two-way communication is not available if our theories are to be useful under more usual circumstances.

4 I have discussed administration in more detail in Perraton (1987) and in a course module for the University of Surrey Diploma in the Practice of Higher Education (Perraton with Lewis 1985). There is also an extensive literature on this from the British Open University and some useful guides to practice such as Dodds (1983).

5 There is, of course, a danger here of pre-emptive categorisation, of making classifications in a way which pre-empts the theoretical ordering of material which may come as and when theory is developed. But the practical advantages of categorising and generalising in discussing administration seem to me to outweigh these dangers.

6 Various classificatory systems, which vary in detail, have been proposed by, among others, el Bushra (1973), and Keegan and Rumble (1982).

7 In practice, distinctions may not be as clear-cut as the typology suggests. The Indira Gandhi National Open University, for example, belongs in class 1 but has a co-ordinating function which places it, with other Indian universities teaching at a distance, within a co-operative structure and so also in class 4. Even with the subdivisions proposed in class 3 there can be difficulties of classification: a department like the College of Adult and Distance Education of the University of Nairobi belongs in class 3.3 but has a small number of subject specialists of its own. Purists might argue that we should really have six groups in class 3 and that the division between single-subject and multi-subject institutions cuts across the other categories.

8 McAnany used five categories, setting effort, the quality and quantity of work done in the programme, as the first. While measures of effort are, of course, a part of some evalautive processes, I see them rather as a means to the end of assessing efficiency or performance than as a separate criterion. I have also borrowed the term 'process' from McAnany's scheme but use it not in the sense that he did of 'how and why a program works or fails to work' but in the sense used by Bruner and Stenhouse.

9 In practice, of course, there are difficulties in using this indicator as a comparative measure where the target population of a distance-teaching programme is different from the population of other examination entrants.

10 Leslie (1978) discusses the issues of evaluation in relation to health campaigns generally. See also Manoff (1977) on Nicaragua and the Philippines and Hall (1978) on Tanzania.

11 The philosophical objections to rate of return analysis apply with as much force here as they do more generally.

12 Wedemeyer and Moore have argued this case (cf Moore 1983); following the analysis used in this paper I would claim that their statements about autonomous learners are generalisations rather than theory but also that they move from description into value judgment.

References

Bååth, J A (1983) 'A list of ideas for the construction of distance teaching courses' in Sewart, Keegan and Holmberg (1983)

Bock, J C and Papagianis, G J (1983) Nonformal education and national development (Praeger, New York)

Briggs, L J et al. (1967) Instructional media: a procedure for the design of multi-media instruction, a critical review of the research, and suggestions for future research (American Institutes for Research, Pittsburgh)

Bruner, J S (1962) On knowing (Belknap Press, Cambridge Mass.)

Bruner, J S (1966) Toward a theory of instruction (Harvard University Press, Cambridge Mass.)

Cantril, A H and Allport, G W (1935) The psychology of radio (Harper, New York)

Carnoy, M and Levin, H M (1975) 'Evaluation of educational media: some issues' Instructional Science 4

Chu, G C and Schramm, W (1968) Learning from television: what the research says (ERIC, Stanford)

Coleman, W F and Opoku, A A (1968) An African experiment in radio forums for rural development (Unesco, Paris)

Dodds, T (1983) Administration of distance-teaching institutions (International Extension College, Cambridge)

el Bushra, J (1973) Correspondence teaching at university (International Extension College, Cambridge)

Freire, P (1972) Pedagogy of the oppressed (Penguin, Harmondsworth)

Galda, K and Searle, B (1980) The radio mathematics project: Introduction and guide (Institute for Mathematical Studies in the Social Sciences, Stanford)

Hall, B L (1978) Mtu ni afya: Tanzania's health campaign (Clearinghouse on Development Communication, Washington DC)

Holmberg, B (1960) On the methods of teaching by correspondence (Lund universitets årsskrift, Lund)

Holmberg, B (1985) 'The feasibility of a theory of teaching for distance education and a proposed theory' (ICDE Conference paper, Melbourne)

International Extension College (1979) Writing for distance education (IEC, Cambridge)

Jamison, D T and Orivel F (1982) 'The cost effectiveness of distance teaching for school equivalency' in Perraton, H Alternative routes to formal education: distance teaching for school equivalency (Johns Hopkins University Press, Baltimore)

Jevons, F R (1982) 'How different is the distance student' in ed Daniel, J S, Stroud, M A and Thompson, J R Learning at a distance: a world perspective (Athabasca University/ICCE, Edmonton)

Kaye, A R and Rumble G W S V (1981) 'Analysing distance learning systems' in Neil, M Education of adults at a distance (Kogan Page, London)

Keegan, D and Rumble, G (1982) 'Distance teaching at university level' in Rumble, G and Harry, K The distance teaching universities (Croom Helm, London)

Kirk, P (1976) 'The loneliness of the long-distance tutor' Teaching at a distance 7

Lakatos, I (1978) The methodology of scientific research programmes: Philosophical Papers, vol. 1 (Cambridge University Press, Cambridge)

Leslie, J (1978) The use of health statistics as an effectiveness measure in certain development communications projects (EDUTEL, Palo Alto) (mimeo)

McAnany, E G (1975) 'Radio schools in nonformal education: an evaluation perspective' in T A La Belle Educational alternatives in Latin America (UCLA Latin America Center Publications, University of California, Los Angeles)

McIntosh, N, Woodley, A and Morrison, V (1980) 'Student demand and progress at the Open University - the first eight years' in Sewart, Keegan and Holmberg (1980)

Mace, J (1978) 'Mythology in the making: is the Open University really cost-effective?' Higher Education 7

Manoff, R K et al. (1977) Radio nutrition education - using the advertising technique to reach rural families: Philippines and Nicaragua (Manoff International, Washington DC)

Moore, M (1983) 'On a theory of independent study' in Sewart, Keegan and Holmberg (1983)

Perraton, H (1981) 'A theory for distance education' Prospects 11:1

Perraton, H (1973) The techniques of writing correspondence courses (International Extension College, Cambridge)

Perraton, H (1987 forthcoming) 'Theories, generalisation and practice in distance education', Open learning

Perraton, H with Lewis, R (1985) Distance learning (Study guide for Diploma in the practice of higher education) (University of Surrey Institute of Educational Development, Guildford)

Peters, R S (1972) 'Education as initiation' in Archambault, R D Philosophical analysis and education (Routledge and Kegan Paul, London)

Psacharopoulos, G (1973) Returns to education (Elsevier, Amsterdam)

Psacharopoulos, G (1980) 'Returns to education: an updated international comnparison' in ed. King, T (1980) Education and income (World Bank Staff Working Paper no. 402) (World Bank, Washington DC)

Rekkedal, T (1983) 'Research and development activities in the field of distance study at NKI-Skolen, Norway' in Sewart, Keegan and Holmberg (1983)

Romiszowski, A J (1981) Designing instructional systems: Decision making in course planning and curriculum design (Kogan Page, London)

Runciman, W G (1983) A treatise on social theory - Volume I: The methodology of social theory (Cambridge University Press, Cambridge)

Sewart, D, Keegan, D, and Holmberg, B (1983) Distance education: International perspectives (Croom Helm, London)

Sheath, H C (1965) External studies - the first ten years (University of New England, Armidale)

Stenhouse, L (1975) An introduction to curriculum research and development (Heinemann, London)

Stenhouse, L (1971) 'Some limitations on the use of objectives in curriculum research and planning' Paedagogica Europaea 6

Trenaman, J (1967) Communication and comprehension (Longmans, London)

Urdang, L (1979) Collins dictionary of the English language (Collins, London)

Woelfel, N and Tyler, I K (1945) Radio and the school (World Book Company, Yonkers)