

THEORETICAL APPROACHES TO DISTANCE EDUCATION AND THEIR PRACTICAL CONSEQUENCES

Theoretical considerations, whether explicit or implicit, guide actions and procedures applied to education – as will have been shown in the preceding chapters of this book. Writers often refer to theory, but what is really meant is not always evident. Attempts have been made to classify theories into different categories, thus by Royce (1978), who was above all concerned with psychological theory. His contribution has been aptly summarized by Rumble in an interesting scrutiny of explanation, theory and practice as related to distance education (Rumble 1992: 115–16).

The term theory is problematic, indeed. In scholarly literature it is used to denote different concepts. It is frequently used to identify any systematic ordering of ideas about the phenomena of a field of inquiry (Gage 1963: 102) – as sometimes when reference is made to the theory of distance education. This is evidently meant when the disciplinary areas of chairs at, for instance, German universities are described as 'theory of education' or 'theory of the school'. Theories are sometimes, in Royce's terminology, analogical. Examples already discussed in Chapter 2 (p. 19) are Fox's metaphors for four different views of learning (the transfer, shaping, travelling and growing theories). In other scholarly contexts a theory represents a structure of reasoned explanations, for which intersubjective testability is a *sine qua non*. As shown in the general discussion of the impact of theory on practice in Chapter 2 a theory in this sense may be expressed as a set of hypotheses logically related to one another in explaining and predicting occurrences. Empirical data can – in principle – corroborate, refute or leave unresolved hypotheses of this kind. The normal starting point in a so far unre-

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solved problem, for instance that of the influence of varying frequencies of opportunities for assignment submission (discussed in Chapter 6 p. 123ff.). An hypothesis is formulated. Relevant data are then traced, collected and evaluated to help to solve the problem, i.e. to support or falsify the hypothesis.

Some theoretical approaches aimed at identifying essential characteristics of distance education are well known, including Charles Wedemeyer's liberal, individualizing 'independent study' (see p. 8); Manfred Dellling's process model (Dellling 1987b; Graff 1970: 44), which may be compared with Kathleen Forsythe's learning system (see pp. 54–5 and 85); Otto Peters' view of distance education as an industrialized form of teaching and learning (see pp. 7 and 16); Michael Moore's theory of independent study, classifying educational programmes on the two dimensions of autonomy and distance (to be considered below); David Sewart's support model, called 'continuity of concern' (see p. 130); and the student-centred, small-scale approach (see pp. 7 and 137).

These and other theoretical analyses illuminate the basic character and varying applications of distance education. Only in part, however, do they meet the well-grounded requirements expressed by Desmond Keegan:

A theory is something that eventually can be reduced to a phrase, a sentence or a paragraph and which, while summarizing all the practical research, gives the foundation on which the structures of need, purpose and administration can be erected. A firmly based theory of distance education will be one which can provide the touchstone against which decisions – political, financial, educational, social – when they have to be taken, can be taken with confidence. This would replace the ad hoc response to a set of conditions that arises in some 'crisis' situation of problem solving, which normally characterizes this field of education.

(Keegan 1983: 3)

Attempts have been made to meet these tough requirements. As early as 1970, Kurt Graff developed a decision model on the basis of a study of the structure and process of distance education, but concluded that the great problems are beyond calculation (Graff 1970: 54).

Hilary Perraton (1981, 1987) has ventured other suggestions as steps on the path toward a theory of distance education, and so has the present author. See under 'A theory of learning and teaching in distance education' below pp. 172-9.

DISTANCE EDUCATION AS RELATED TO GENERAL THEORIES OF TEACHING AND LEARNING

If we relate the appreciation of what constitutes distance education, as discussed in the preceding chapters, to current teaching and learning theories, we inevitably come to the conclusion that several of those theories are relevant to distance education. John Bååth has made systematic searches in this respect and has analysed the following 'models' with a view to discovering to what extent they are applicable to distance education:

- 1 Skinner's behaviour-control model.
- 2 Rothkopf's model for written instruction.
- 3 Ausubel's organizer model.
- 4 The model of Structural Communication.
- 5 Bruner's discovery-learning model.
- 6 Rogers' model for facilitation of learning.
- 7 Gagné's general teaching model.

Structural communication, so far not mentioned in this book, is an exceptional type of programmed learning which is unrelated to the behaviourist stimulus-response theory and based on Gestalt thinking. It was originally developed by J. G. Bennett and A. M. Hodgson. This particular type of programmed learning is to all intents and purposes compatible with the problem-solving approaches discussed earlier in this book, whereas the behaviourist school of stimulus-response theory is not (Egan 1976).

Bååth has investigated the general applicability to distance study of each of the approaches listed and has analysed their implications for the development of course material, for non-contiguous two-way communication, and for supplementing this two-way communication by face-to-face contacts. Further, he has analysed some special relations between these various models and distance education.

The following would seem to be an accurate summary of Bååth's study:

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- All models investigated are applicable to distance education.
- Some of them (Skinner, Gagné, Ausubel, Structural Communication) seem particularly adaptable to distance education in its fairly strictly structured form.
- Bruner's more open model and even Rogers' model can be applied to distance education, though not without special measures, e.g. concerning simultaneous non-contiguous communication (telephone, etc.).
- Demands on distance-education systems which should inspire new developments can be inferred from the models studied.

(Bååth 1979b)

It is possible to describe some learning theories as more compatible with distance education than others. In this context it is tempting to refer to Nuthall and Snook's rational model with its view of students as 'rational agents' and its creed 'Learning... should not be a process to which the student is subjected but an activity which he performs' (Nuthall and Snook 1973: 67), and also to two theoretical works by Lehner, which develop, on the basis of Popper's philosophy, a so-called genetic teaching strategy aiming at problem-solving learning. Lehner regards all learning as problem-solving in that it consists of constructing hypotheses or theories and trying these out. In the sense of Popper's 'Conjectures and Refutations', the rejection of a false hypothesis in favour of a better one is seen as progress in learning. Causing students to follow the development of theories and research, inclusive of the steps that have been found to be wrong, is a method of introducing them to both a subject and critical, independent thinking (Lehner 1978, 1979). See also pp. 35 and 64.

Ausubel's theory of reception learning has proved particularly influential in the general domain of written instruction. It is interesting to note (taking one well-informed educationalist as an example) that Hudgins on the one hand says that only 'rarely have investigations of instructional media been guided by an overarching theory or conceptual structure about the nature of communication, teaching, or learning', and on the other hand explicitly takes 'advantage of the basic concept of Ausubel's system' (Hudgins 1971: 177). On Ausubel's advance organizers see pp. 59-60.

Among the Ausubel arguments that Hudgins considers 'particularly relevant to a consideration of text materials for instruction' the following seem specially noteworthy:

- Text materials should follow the principles of progressive differentiation and integrative reconciliation. In turn, these two concepts demand that the text writer begin by introducing a selected set of the most general concepts from the domain of knowledge about which he is writing... The principle of progressive differentiation demands that the writer subsequently introduces less important concepts, and continues to indicate the ways in which they differ from each other and from the more overarching concepts previously introduced. Ausubel argues that those major concepts provide a kind of ideological anchoring, a clarity, and a stability for the learner to hold on to as he learns lower order and less general elements of the lesson.

Integrative reconciliation is a term used by Ausubel to refer to the repeated reference to the same concepts as the discussion of an area of knowledge proceeds. It is his contention that textbook writers compartmentalize knowledge and write as though one topic, once it has been presented and developed, need never again be thought about, and has no relationship to other concepts or topics within the same domain of knowledge. On the contrary, as Ausubel points out, knowledge is not typically so compartmentalized, and textbook writers would perform a more effective service to learners if they attempted to avoid the fragmentation of isolated chapters and utilized the principle of integrative reconciliation more frequently and more appropriately...

- Text materials should be written so as to stimulate the active, critical, reflective, and analytic involvement of the learner.

(Hudgins 1971: 178-80)

The theories mentioned by Båth, Hudgins' highlighting of some concepts of Ausubel's, Lehner's genetic approach, and Nuthall and Snook's rational model would all seem to show conclusively that distance education and thinking about distance education are firmly based in general educational theory although distance edu-

cation represents a separate type of education with special target groups, methods, media, and other circumstances in which it differs from other kinds of education. It is, writes Desmond Keegan, 'a coherent and distinct field of educational endeavour', it is more than a teaching mode or method. It is a complete system of education' (Keegan 1986: 6). Not everybody would agree, however.

DISTANCE EDUCATION: A MODE OF EDUCATION IN ITS OWN RIGHT OR A SUBSTITUTE FOR FACE-TO-FACE EDUCATION?

The applications of distance education already referred to in this book will have shown that there are important basic differences in the appreciation of its character. To some it is merely a means of distribution that can sometimes replace oral distribution of subject matter for learning, to others it is a mode of education that exists beside and is equal to education offered face to face.

While the latter view is, on the whole, represented by the large correspondence schools, the distance-teaching universities, and similar organizations (see pp. 9-12), the former view is implicit in, for example, the comparative studies of the effectiveness of distance-education methods and that of face-to-face methods that were common at a time when distance education (correspondence education, home study) fought for recognition as a useful approach to teaching and learning (Childs 1971: 238ff.). The usual design of such studies was an arrangement with two comparable groups of students made to learn the same subject matter, one by working through a correspondence course, the other by taking part in ordinary classroom teaching; the achievements of the two groups were then compared statistically. Peters refers to research of this kind as relatively advanced statistical work combined with a complete lack of theory ('ein relativ fortgeschrittene statistisches Treatment bei völliger Theorielosigkeit'; Peters 1973: 17). This kind of comparison illuminates a view of distance education which entirely neglects the inherent potential for both individual and mass education (rather than the education of organized classes of students), for reaching students irrespective of geographical distance, and for the 'multiplication of advanced expert achievements' (ibid.).

Something of the same approach to distance education emerges in cases where, for technical reasons (such as the

impossibility of co-ordinating in an acceptable way periods for classroom activities for gainfully employed adults, or the lack of teachers), courses are offered at a distance as a substitute for ordinary face-to-face courses. While there can be no objection to this use of distance-education procedures, they utilize only a small part of the potential of distance education. This can also be said about some small-scale applications. A striking example is the Canadian University of Waterloo:

we have fixed starting times for a course, a fixed schedule of assignments, a fixed duration of a course, and a fixed examination schedule. Our approach is to treat students as members of a class, although that class is distributed geographically. Thus our students start a course together at the same time and have to submit assignments and write examinations on a schedule in exactly the same way as a class on campus is required to do.

(Leslie 1979: 36)

The insistence on classes and pacing seems to represent a typical characteristic of the view of distance education that regards it as a substitute for education face to face. Conventional views of educational planning and organization induce protagonists of this school of thought to impose the same restrictions on distance study as are usually unavoidable in traditional study: limited geographical coverage, classes of limited size, regular meetings, pacing, division of the year into terms of study, prescribed examination dates, vacations, etc. To the extent that, in systems adopting these limitations, the type of distance education applied is felt to be innovative, it is what Ross (1976) calls innovation within the accepted paradigm.

Once distance education is applied outside the organizational and administrative framework of conventional schools and universities, its potential for extra-paradigmatic innovation becomes evident. Its claim to be a mode of education in its own right is based on this potential.

The innovative character of distance education in this sense emanates from the following:

1 The underlying ideas that learning can occur without the presence of a teacher and that the support given to students can

be adapted to their standards of knowledge (instead of insisting on formal entrance qualifications).

2 The consistent use of non-contiguous media both for the presentation of learning matter and for the ensuing communication.

3 The methods used to exploit the non-contiguous teaching/learning situation so as to attain the highest possible effectiveness for the individual learner: structure and style of presentation and communication (didactic conversation), appropriate use of media available, adaptation to students' conditions of life, etc.

4 The particular organization which makes it possible to provide for both independent individual learning and mass education through personal tutoring and more or less 'industrialized' working methods.

5 The liberation from organizational and administrative restrictions usually inevitable in face-to-face education: geographical limitations, school or university terms, keeping prescribed pace etc.

6 The possibilities it offers for economies of scale.

7 The influence distance education exerts on adult education, further training, and labour-market conditions, by opening new study opportunities as well as through its methods and organization.

In distance-education systems using these characteristics to the full, it is possible for each student to begin, interrupt, and complete the study as it suits him/her or as work, health, and family conditions allow, to work at his/her own pace, and to disregard all the restrictions that apply to classroom teaching or group learning.

Thus there are at least two different schools of thought on distance education: one stressing individual study and individual, non-contiguous tutoring, the other aiming at parallelism with resident study and usually including class or group teaching face to face as a regular element. The former can and does serve mass education. It is in this context that the industrial approach is important. It stresses rationalization and division of labour in the interest of quality and economy. This view is widely accepted as shown in this Canadian statement:

The extra effort required in the development of distance

education courses pays off when the same materials can be used to teach any number of students at any number of different institutions. The creator of the course need not be involved in delivery, and the tutor who deals with students 'ceases to be the master of the content and must become the guide, mentor and catalyst to aid the student's journey through a pre-structured or open-ended learning experience'.... Communicating with distant students requires special skills for which training may be provided.... This is an area that would benefit from further attention by researchers.

(Calvert 1986: 102)

Industrialization in this sense implies using first-class specialist authors, editors, media specialists, designers, etc. for the development of courses to be produced in large editions, and other specialists for counselling, tutoring, assessment, administering the work, etc. High quality is attained by the division of the work among specialists for each individual task.

This approach is fully or partly applied by the large distance-education organizations, whereas (as shown on p. 162) small-scale distance education in many cases favours procedures more in line with traditional face-to-face education. Sometimes there is no other choice, as only large-scale organizations are in a position to benefit fully from this 'industrial' approach. Both usually aim at individualizing their tuition. Thorpe (1979a) says about one large-scale organization, the British Open University, that 'the course teams provide the reading material (texts, broadcasts, kits) for hundreds or thousands of students in general and the course tutors and tutor-counsellors teach the students as individuals' (p. 1).

It is evident that the industrial approach in this sense does not preclude individualization or personal communication. It is thus quite compatible with the attempts to create rapport between tutors and students, characterizing the conversation concepts discussed on pp. 45-55.

Distance education, using its full potential as indicated, must necessarily be regarded as a separate kind of education which can only to a limited extent be described, understood, and explained in terms of conventional education. This is one of the main conclusions of Otto Peters' analysis of the 'industrial'

character of distance teaching as compared with traditional teaching (Peters 1973: 309-10).

STUDENT AUTONOMY V. CONTROL OF STUDENTS

As shown above, distance education can be extremely flexible. It is adaptable to students' conditions in that they can learn anywhere and at any time. There are no lecture or lesson periods to be observed and concepts such as terms of study and vacations need have no importance. It is inherent in distance education that organized learning can occur whenever students have opportunities and inclinations to study. In principle it leaves the student entirely in command.

If consistently applied, this flexibility allows students to begin and finish courses, submit assignments, make interruptions in their study, and register for examinations, if any, whenever they wish. A great many distance-teaching organizations, in particular correspondence schools, adopt this flexibility. Other distance-teaching organizations, among them most distance-teaching universities, compromise in that they do not make full use of the inherent potential of their mode of teaching: they tend to apply a term-vacation system like conventional schools and universities, they insist on a certain amount of pacing, and are often prepared to handle, correct, and comment on students' assignments, essays, etc. only during periods that they prescribe for this type of work.

Michael Moore has developed an interesting theory of independent study, classifying educational programmes on the two dimensions of autonomy and transactional distance, the latter expressed in terms of dialogue and structure, which he describes in the following way:

Autonomy is the extent to which the learner in an educational programme is able to determine the selection of objectives, resources and evaluation procedures.... Distance in an educational programme is a function of dialogue and structure. Structure is the extent to which the objectives, implementation procedures and evaluation procedures of the teaching programme can be adapted to meet the specific objectives, implementation plans and evaluation methods of a particular student's learning

programme. Dialogue is the extent to which interaction between learners and teacher is possible....

... To the extent that a programme consists of pre-produced parts, at least in the form of particularized plans listing item by item the knowledge and skills to be covered by the programme, the programme may not be responsive to learners' idiosyncrasies, and structure is said to be high....

When dialogue is difficult, or impossible, and when structure is high, 'admonitory acts' become difficult or impossible. In a programmed text, such as Mager's, a minimum of dialogue between teacher and learner is obtained by use of the branching technique. The admonitory acts, such as 'Oops! You didn't follow instructions', are weak by contrast to the power such statements would carry in a highly dialogic interaction. In telemathic teaching [= distance teaching in Moore's terminology] 'directive action' is more easily communicated than admonition, but the teacher must assume that a large part of direction, as well as admonition, will be self-administered by the learner. The less distance, the more direction will be feasible. Even the most distant teachers are able to communicate 'logical operations'. Whether a particular learner will benefit from a programme low in distance, or from a highly telemathic programme is determined by the extent to which he benefits or is impaired by direction and admonition. This is determined by his competence as an autonomous, or 'self-directed' learner.

(M. Moore 1977: 33 and 20)

[Telemathic (teaching) equals distance (teaching) in Moore's terminology.]

The highest degree of distance occurs when a person studies without any support at all, which Moore describes as 'programmes with no dialogue, and no structure' and exemplifies by 'independent reading-study programmes of the "self-directed" kind'. A normal distance-study course provides facilities for interaction ('dialogue') as well as structure in Moore's sense. He has made an empirical study of the hypothesis that autonomous persons are particularly attracted to distant methods of learning and teaching. On the whole, this has been confirmed although it has also been found that distance students do not reject guidance (M. Moore 1976).

This thinking has been developed further by Farhad Saba, as summarized by Moore:

Saba has confronted the problems presented to distance education theory by interactive telecommunications and expanded the concept of transactional distance by using system dynamics (Saba 1989). Through this methodology he has produced a fine model of the dynamic inter-relationship of dialogue and structure. He refers to 'integrated systems' of telecommunication media and explains that maximization of dialogue via integrated systems minimizes transactional distance. He proposes that a significant feature of integrated telecommunications is that it achieves what he calls virtual contiguity by sight and sound, as well as by sharing and exchanging printed documents. This virtual contiguity more than equals face-to-face instruction.

(Moore 1989: 161-2)

Full student autonomy would imply not only complete flexibility and independence for students in the process of study but also the right and possibility to decide entirely independently and individually on the learning content. This freedom is usually a fact only in so far as students can choose broad courses of study. Only in exceptional cases is it possible for a student to select his or her own study objectives, although modular systems can make this possible. See pp. 15, 44 and 70-1. Down-to-earth suggestions for dealing with this problem are given in Ljosa and Sandvold (1983).

Growing awareness of the role of learners in the construction of knowledge makes considerations of this kind come to the fore.

Knowledge does not exist independently of those who possess it. It cannot be transmitted unchanged to the learner. It always fits into the existing framework of understanding of the learner and is shaped by this framework... Learning for meaning and tight teacher control sit uneasily together. Learners must make their own maps of knowledge.

(Bond 1990: 6)

In an interesting staff-development course, leading to degrees in education for university lecturers (also referred to on p. 151), Lewis Elton and his co-workers have managed to cater for far-reaching student autonomy by 'presenting material in a general

manner and expecting course members to relate this to their own experience and current work' (Elton *et al.* 1986: 30). As it was impossible to create a course directly relevant to all participants, a course was developed 'which each member could make directly relevant to his own experience. To do this, we kept the course purposely general, but expected participants in each assignment which they submitted to relate the general to their particular experience' (*ibid.*).

This approach (characterized by much dialogue and limited structure in Moore's sense) proved successful and can be regarded as a prototype of autonomy-supporting and autonomy-expecting academic distance teaching (cf. Holmberg 1986: 87-94).

The arguments both for and against complete flexibility, allowing students full autonomy, are based on ideological principles as well as on practical considerations. Those in favour of full student autonomy feel that any uninvited intervention in adult students' work (sometimes even offers of assistance in coping with specific problems) encroach on the personal integrity of students, whereas those prepared to limit students' independence by various control measures consider it a moral and social duty as far as possible to prevent failure.

The practical arguments in favour of student autonomy are based on adult students' general situation, which usually means that family and job commitments and social obligations must be given first priority. Study occurs when these duties allow and students are physically and emotionally prepared for it. This is taken to mean that no timetable that is arranged by others than the students themselves is to be followed. Complete flexibility and full student autonomy create a very open system attractive to many but hardly likely to lead to course completion in a majority of cases. It cannot be denied that here we often have reason to refer to the survival of the fittest, a kind of 'natural selection'.

If a system has, as its chief priority, respect for the freedom and autonomy of the individual student, it will allow him to begin a course whenever he chooses and to finish it at his convenience. The student paces himself and there are 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, or non-completion rate, with such a free approach is usually horrendous (over 50 per cent) if the students are humans rather than angels.

(Daniel and Marquis 1979: 34)

The practical arguments in favour of control are usually based on anxiety to avoid wastage. It is felt to be essential that course completion should be attained in as many cases as at all possible. See Coldeway (1986), who stresses the influence of pacing on completion rates: 'Students are less likely to procrastinate when deadlines are clear. Getting behind schedule makes it even more difficult to generate energy to continue' (Coldeway 1986: 89). This leads to somewhat restrictive practices which exclude would-be students unable to adapt themselves to them. Irregular working periods, travel on duty, poor health requiring occasional hospitalization, pregnancy, care of sick children, etc. are conditions which may prevent students from following a timetable but yet may allow periods of concentrated study, for example during normal vacation time. Control measures of the kind mentioned inevitably cause a kind of pre-active natural selection, supposedly more merciful than failure after enrolment and a period of organized learning, but perhaps unnecessarily obstructing study that promotes personal development.

In practice the potential of distance education, as discussed on pp. 161-4, is exploited more or less fully also in relation to student autonomy vs. institutional control of students. A careful study of student autonomy and its limits in distance education was carried out in 1990 by Monika Weingartz. Using as her empirical basis the data collected in a FernUniversität international study comprising some 200 distance-teaching organizations (see Graf and Holmberg 1988) she identified an autonomy score, a score of individual control, one of goal-oriented control and one of control by additional media. Her study shows that almost 25 per cent of the organizations studied endeavour to promote a high degree of autonomy, whereas some 70 per cent of them apply highly individualized control methods, i.e. personal tutoring and counselling. Weingartz' analysis includes contract learning (p. 73). She concludes that selected individual control measures of the kind mentioned are essential for student auton-

omy, that independent study does not imply unlimited freedom but a differentiated guidance of learners engaging students and tutors together and that the need for tutoring and counselling diminishes as students become more independent (Weingartz 1990: 81). Isaacs writing on computer-assisted learning comes to a similar conclusion: 'In courses aimed at making students more independent as learners a degree of control is placed in their hands; students learn control by practising control' (Isaacs 1990: 86). On the independence and control concepts see Bond (1988); Baynton (1992); Candy (1987) and Elton (1988).

Occasionally the value of attempts to promote student autonomy is queried. Garrison and Shale ask 'whether autonomy is desirable, realistic, or even possible to attain', and believe that 'the usual notion of independence runs a serious risk of obscuring the true nature of education' (Garrison and Shale 1990: 124). They state their position as 'independence is not an essential characteristic of distance education' (p. 129). See also Willén 1981: 249-50.

In higher education and adult education, those in favour of student autonomy can find themselves in a dilemma. Should student autonomy be promoted by intervention (advice, suggestions, offers of support), which is possibly unacceptable to autonomous learners who consider study their private concern and decline what they regard as well-meant officiousness? Alternatively, should students be left alone to fight for survival, i.e. completion and/or success in their study? This dilemma is aggravated in adult education, as its students can hardly ever give first priority to their study.

Adult students can reasonably be expected to be mature. Maturity seems to go well with autonomy. Thus, on the one hand, should adult students not be expected to be (and thus be treated as) autonomous learners, so that the responsibility for searching for solutions and asking for support when needed should be left to them alone? On the other hand, does their difficult situation with heavy commitments other than study not warrant special support? Distance educators and adult educators generally have to navigate between Scylla and Charybdis here (Holmberg 1986: 64-71).

From what has been said in the preceding chapters, it is evident that we can identify at least the following degrees of student autonomy in distance-education practice:

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- 1 Voluntary study and free choice of course.
- 2 Autonomous execution of study based on prescribed curricula.
- 3 Free choice of optional elements as part of autonomous learning according to 2.
- 4 Possibilities to add to and reduce curricula, by including course units from other curricula and omitting units from the curriculum to be studied, as part of autonomous learning according to 2.
- 5 Free choice of learning objectives, course units, optional supplements etc. combined with autonomous execution of the study.
- 6 Autonomous work under the guidance of tutors (representing interdependence).
- 7 Autonomous project work.

If students are to be treated as mature people, and if student autonomy is to be promoted, this must have methodological consequences. The following principles belong here:

- 1 Student participation in the planning of the study is to be aimed at in order to secure its lasting relevance to the individual students.
- 2 Students' individual interests and/or experiences should influence the study content and process.
- 3 Flexibility in the structure and use of pre-produced courses is an indispensable condition: modular principles, study-guide approaches, student-initiated deep study of selected subject areas are applicable.
- 4 Problem-oriented discussion of subject matter should supplement and guide endeavours to impart knowledge; as an alternative to presenting 'ready-made' systems of knowledge, courses can start out from particular problems (an approach investigated by Weingartz 1980; see pp. 35 and 64).
- 5 Conversation-like, pre-produced presentations of subject matter, inviting students to query, check, investigate on their own, and pose explicit questions, are to be aimed at (see pp. 45-55).
- 6 Dialogue, contiguous or non-contiguous (the latter dominating in distance education), causing awareness of problems and attempts to solve them and making students consider and try to reach positions of their own, must be catered for (see

pp. 19-20 and the above remarks on course development and teaching-learning communication).

- 7 General empathy in relation to students' autonomy orientation should characterize the work of the supporting organization in subject-matter presentation, tutoring, and counselling.

A THEORY OF LEARNING AND TEACHING IN DISTANCE EDUCATION

The facts, issues and arguments discussed provide background matter for a possible general theory of distance education. Hilary Perraton's approach, mentioned above (p. 158), is pertinent. Perraton (1981) bases his arguments on a view of education as connected with power and makes a case both for expanding education as an egalitarian requirement and for stressing the importance of dialogue. His contribution to a theory of distance education is in the form of fourteen hypotheses or statements.

The dependence on political contexts is stressed by Perraton, as are the possibilities inherent in distance education for economies of scale and the expansion of education. This is evident from his statements:

No 2 Distance teaching can break the integuments of fixed staffing ratios which limited the expansion of education when teacher and student had to be in the same place at the same time.

No 3 There are circumstances under which distance teaching can be cheaper than orthodox education, whether measured in terms of audience reached or of learning.

No 5 Distance teaching can reach audiences who would not be reached by orthodox means.

These points have been covered above. So have the following, purely educational statements, which also partly coincide with my theory attempt on pp. 175-81:

No 6 It is possible to organize distance teaching in such a way that there is dialogue.

No 10 A multi-media programme is likely to be more effective than one which relies on a single medium.

No 11 A systems approach is helpful in planning distance education.

No 12 Feedback is a necessary part of a distance-learning system.

No 13 To be effective, distance-teaching materials should ensure that students undertake frequent and regular activities over and above reading, watching, or listening.

Perraton finishes his theory paper by asking if his formulation of hypotheses suggests 'ways of testing them which would yield useful knowledge for practical educators' (p. 24). This is exactly the concern that has caused me to attempt a theory, as presented below. Presentations of other theoretical approaches to distance education occur in Keegan (1990) and Høhnborg (1985a).

A really comprehensive theory of distance education including all relevant and social aspects seems out of reach. The situation may well be different if theorising is limited to the teaching-learning process. A teaching-learning theory of distance education could consist of a mainly descriptive part, dealing with learning, and a more prescriptive part concerned with teaching. Whereas the former would expound the assumptions about learning, how and under what circumstances it occurs at a distance, the latter would attempt to gather into a coherent, inclusive exposition the principles for action supposed to cause effective teaching, i.e. facilitation of learning. Organizational, administrative, and financial conditions are relevant to both these parts.

It should be possible, at least to some extent, to express these assumptions as logico-deductive hypotheses (if A, then/then not B; or, the more/less A, the more/less B), which can be transformed into prescriptive rules of the type discussed on p. 24. If the hypotheses are based on (generated from) a consistent view of what is probable (a logically coherent but, at the outset, possibly only implicit theory), the testing of the hypotheses would then imply an attempt to falsify or corroborate the underlying theory.

Search for theory

In my search for an inclusive theory of this kind, I have for many years been concerned with the personal and the conversational as characterizing distance learning and teaching, have paid attention to the influence of emotions and have in this spirit developed

(and published) attempts to base theory wholly or partly on this approach. My theory of the guided didactic conversation, first outlined in 1960 and later formalized and subjected to empirical testing (reported on in 1982 and 1983), has been summarized in the discussion of overarching principles for course development (see pp. 45-55). The relevance of personal approaches also to mediated communication has further been demonstrated (see pp. 126-7) and shown to be in agreement with empirical research findings (particularly Rekkedal 1985).

A more comprehensive theory of teaching for distance education, including the former theory, was presented at the ICDE conference in Melbourne in 1985 and subsequently published (Holmberg 1985c). In my book of 1986, I developed the same thinking and tried to provide a general base for it in a series of descriptive statements (pp. 108-11) and a general view of distance education (p. 114). In this presentation it should be possible to forgo these two elements as in the preceding chapters the concept, system, potential, and practice of distance education, with its constituent elements, have been dealt with at some length. Here I prefer to explore a theory concerned with the purely educational aspects of learning and teaching with their surrounding circumstances and restrictions.

Decisive to my approach is the realization that, as David Boud puts it, 'feelings and emotions are part of learning of any kind' and that 'learning is holistic. Learners cannot separate... their understanding from the excitement of discovery' (Boud 1990: 7). Necessary foundations of theory construction in our field are the meanings attached to the concepts of independence, learning, and teaching. These have been discussed on pp. 18-20, 32-6 and 165-71. Meaningful learning, which anchors new learning matter in cognitive structures, not rote learning, is the centre of interest. Teaching is taken to mean facilitation of learning. Individualization of teaching and learning, encouragement of critical thinking, and far-teaching student autonomy are integrated with this view of learning and teaching. A basic presupposition is the reliance on a school or university to administer distance education, in the spirit of what Delling calls the supporting organization.

I thus try to build on my previous attempts, as indicated, and include learning, teaching, and their organizational/administrat-

ive frames in a theory of distance education capable of generating testable hypotheses.

Theory content

My theory can be worded as follows:

Distance education is based on deep learning as an individual activity. Learning is guided and supported by non-contiguous means which activate students, i.e. by mediated communication, usually based on pre-produced courses. This constitutes the teaching component of distance education for which a supporting organization is responsible.

As individual study requires a certain amount of maturity, self-discipline, and independence, distance education can be an application of independent learning at the same time as it is apt further to develop study autonomy. Central to the learning and teaching in distance education are personal relations, study pleasure, and empathy between students and those representing the supporting organization.

Feelings of empathy and belonging promote students' motivation to learn and influence the learning favourably. Such feelings can be developed in the learning process independently of any face-to-face contact with tutors. They are conveyed by students' being engaged in decision making; by lucid, problem-oriented, conversation-like presentations of learning matter that may be anchored in existing knowledge; by friendly, non-contiguous interaction between students and tutors, counsellors, and other staff in the supporting organization; and by liberal organizational-administrative structures and processes.

This epitomizing theory presentation, the factual and argumentative substance of which has been developed in the preceding chapters, immediately generates the following hypotheses, all of which can be worded as if... then or the... the propositions, as indicated on p. 24, and can, at least in principle, be empirically tested.

Hypotheses derived about distance learning

- 1 Organized learning can occur without the presence of a teacher or tutor.
- 2 Intrinsic motivation is a crucial condition for learning.
- 3 Learning is promoted by students fitting subject matter into existing cognitive structures.
- 4 Warmth in human relations, bearing on the study situation, is conducive to emotional involvement.
- 5 Emotional involvement in the study promotes deep learning and goal attainment.
- 6 Feelings of rapport with tutors, counsellors, and the supporting organization generally strengthen and support study motivation as well as promote study pleasure.
- 7 Intellectual pleasure favours deep learning, the use of problem-oriented study processes, and the attainment of study goals.
- 8 Participation in goal considerations and study planning encourages personal commitment to the learning and feelings of responsibility for the attainment of study goals.
- 9 Learning is encouraged by frequent, helpful communication with others interested in the study.
- 10 Maturity makes for motivational stability and the capacity to master difficulties and is more likely than not to be combined with inclinations and ability for independence.

Hypotheses derived about distance teaching

Two overarching hypotheses are natural corollaries of the hypotheses about learning:

- 1 Teaching and counselling can be effectively carried out by non-contiguous means; real mediated communication and simulated communication, incorporated in distance-education courses by conversational style and other personal approaches, make dialogue possible.
- 2 Personal (not necessarily or primarily contiguous) contacts with tutors and other representatives of the supporting organization promote emotional involvement.

These overarching hypotheses, which could be regarded as a theory of teaching for distance education (i.e. as covering part

of the theory formulated on p. 175), seem to have explanatory value in relating teaching effectiveness to the impact of feelings of belonging and co-operation as well as to the actual exchange of questions, answers, and arguments in mediated communication. More specific and more easily tested teaching hypotheses, which are derived from the theory, are that the following phenomena are favourable to teaching (i.e. facilitation of learning):

- 3 A presentation of course goals or objectives which engages the student in the evaluation of their relevance and, if at all possible, in their selection.
- 4 A course structure carefully based on required earlier learning, which makes assumptions in Ausubel's sense possible.
- 5 Pre-produced courses characterized by a conversational style with invitations to an exchange of views and with attempts to involve the student emotionally.
- 6 A style of presentation that is easily accessible; a high degree of readability of printed course materials.
- 7 Graphical and typographical presentations facilitating access to printed courses and selections of relevant subject matter.
- 8 Sequencing: a choice of media and other principles for course presentation adapted to student needs and to the requirements of subject areas studied, e.g. those of operations on knowledge and operations with knowledge (Chang *et al.* 1983: 14-16).
- 9 Communication facilities (in writing, by computer, on the telephone, and/or by audio tape) constantly open to students for questions and exchanges of opinions with tutors and counsellors.
- 10 Frequent submission of assignments requiring students to solve problems, evaluate texts or recordings; research findings indicate that this is valid if combined with 11.
- 11 Friendly, helpful, and extensive tutor comments on assignments submitted, with suggestions expressed in a way to promote personal rapport between student and tutor.
- 12 Quick handling of assignments so that students need not wait for more than a week to have their work returned with corrections and comments.
- 13 Self-checking exercises in pre-produced courses, through which students are encouraged to practise skills (in, for

instance, foreign languages, mathematics, statistics); not only model answers should be provided but also extensive comments based on course writers' experience of probable errors and misunderstandings.

Hypotheses about organization and administration

Empathy is an essential requirement of the way in which students' (also more peripheral) concerns are handled by the supporting organization. This applies not only to counselling (which is, of course, closely related to teaching) but also to correspondence, telephone contacts, dissemination of information on administrative matters, the dispatch of learning materials, assignments commented on, and warehousing procedures.

This thinking produces a first hypothesis concerning:

1 the impact of the empathy approach on administration.

Other hypotheses related to the organization of distance education are possible and plausible. They can, for example, concern:

- 2 The factors leading to different types of organizations, for example goals, target groups, social and cultural frame factors influencing learning and teaching.
- 3 The educational consequences or organizational structures.
- 4 Effectiveness and economics.

The factual background of these and similar hypotheses is to be found in the basic characteristics of distance-education institutions and the interrelationships of these characteristics. (Graf and Holmberg (1984: 10-11 and 37-57).

Generally applicable hypotheses are these, for example:

- 5 The less dependent the study is of societal control and of prescribed curricula and procedures, the greater the possibilities not only to individualize the work but also to support student autonomy.
- 6 If industrialized working methods are used, including systematic planning of courses, standardized procedures, and mechanization and division of labour, then the standard of pre-produced courses is likely to be high (and distance education will be particularly cost-effective for courses with large student numbers).

7 If a small-scale approach is applied, including course creation by individual tutors who also teach students at a distance by interacting with them non-contiguously, then adaptability to specific groups is facilitated (whereas no cost advantages in comparison with conventional education are to be foreseen).

The testability of the hypotheses

Most of the above hypotheses have been expressed as straightforward statements. It is evidently easy to translate them into if... then... or the... the... hypotheses: if the conditions mentioned occur (the more they occur...), then (the more) learning will be promoted (teaching and administration will facilitate learning).

As far as the hypotheses about teaching are concerned, I have actually elsewhere suggested exact wordings of this kind (Holmberg 1985c). Proper, non-ambiguous operationalization of concepts is required to make testing meaningful.

The teaching and administrative hypotheses derived from the theory are easier to operationalize than those of learning. If we assume that emotional involvement, intellectual pleasure, and empathy exert influence on learning, we can test this assumption only if we specify which signs are taken to indicate the presence of these feelings. In our case, the outcome (as to attitudes and learning) of measures taken to bring about the desired phenomena (i.e. the teaching and administrative procedures mentioned above), the effect of which can more comfortably be tested, is the indirect means to check on the relevance of the assumptions about learning.

Quite a few of the hypotheses mentioned have directly or indirectly been tested. This applies to the hypotheses about assumption (Ausubel 1968); conversational style (Holmberg, Schuemer and Obermeier 1982); readability (Langer *et al.* 1974); access structure (Doerfert 1980); frequency of assignment submission (Bååth 1980 and Holmberg and Schuener 1989); quick handling of assignments, i.e. turn-around time (Rekkedal 1983); and the allocation of personal tutor-counsellors (Rekkedal 1985). In similar ways the other hypotheses derived from the theory, as worded on p. 175, can be tested.

EPISTEMOLOGICAL CONCERNS

While I feel committed to much in Popper's rationalism, it must be admitted that my theory concept only partially agrees with his. The hypotheses derived can be submitted to falsification following Popper's epistemological principles, as quoted on p. 24. According to these, the task of scholarship is both theoretical, to bring about explanation, and practical, to provide for application of technology.

According to Popper the aim of the theoretician:

is to find *explanatory theories* (if possible, true explanatory theories); that is to say, theories which describe certain structural properties of the world, and which permit us to deduce, with the help of initial conditions, the effects to be explained... My explanation of explanation has been adopted by certain positivists or 'instrumentalists' who saw in it an attempt to explain it away - as the assertion that explanatory theories are nothing but premises for deducing predictions. I therefore wish to make it quite clear that I consider the theorist's interest in explanation - that is, in discovering explanatory theories - as irreducible to the practical technological interest in the deduction of predictions. The theorist's interest in predictions, on the other hand, is explicable as due to his interest in the problem whether his theories are true; or in other words, as due to his interest in testing his theories - in trying to find out whether they cannot be shown to be false.

(Popper 1980: 61)

My theory is not what the 'critical rationalists' in the spirit of Popper would call nomological, i.e. it cannot be said to apply everywhere and under all circumstances. It is 'impossible to determine an absolute set of instructional procedures that will be "best", for different learners, or for different learnings by one learner' (Hosford 1973: 114). Education as a research area is, of course, concerned with human beings with personalities, hopes, and wills of their own. If we are not determinists in the sense that we totally reject the assumption that human will is in any respect free, then it is impossible to postulate any automatic cause-effect principle in research that aims at optimizing educational methods and procedures. Here theories usually have to

be limited to statements to the effect that if such and such a measure is taken under specific circumstances, then this is likely to facilitate learning.

The requirements which my theory is meant to satisfy are, with the reservations made, those usually expected of educational theories, i.e. that they should:

- 1 Have internal consistency as logical systems.
- 2 Establish functional relationships between the teaching and the outcomes of learning.
- 3 Be capable of generating specific hypotheses and predictions.
- 4 Be expressed in such a way that research data capable of possibly refuting (falsifying) the theory can be collected.

My theory with its hypotheses in this spirit may stress prediction more than a truly Popperian theory would do. However, it has some explanatory power, as it implies a consistent view of effective learning and teaching in distance education which identifies a general approach favourable to learning and to the teaching efforts conducive to learning.

SUMMARY OF THE DISTANCE-EDUCATION CONCEPT AND THEORY

The principles, facts, and arguments developed above lead to the following conclusion. Distance education is a concept that covers the learning-teaching activities in the cognitive and/or psychomotor and affective domains of an individual learner and a supporting organization. It is characterized by non-contiguous communication and can be carried out anywhere and at any time, which makes it attractive to adults with professional and social commitments.

Through distance education a course of study can be offered to very large numbers of students. This implies possibilities for division of labour in the supporting organization between counsellors, course writers, instructional designers, editors, developers of audio-visual materials, tutors, administrators, etc. This leads to a varying amount of mass-communication and industrialization and to economies of scale.

Distance education requires a degree of maturity in its students, as they usually carry out the study activity autonomously. While expecting a certain amount of student autonomy, distance