under the objectives, which will lead to open-ended tasks of a project type in the course to be developed.

The basic problems connected with definitions of study objectives do not concern their efficiency as control instruments but their appropriateness from the points of view of both the individual and society. The relevance and necessity of the objectives for the main educational goals, their appropriateness as seen from a wider perspective than that of the course that is being planned, their influence on the self-actualization of individual students whose integrity must be safeguarded, and their compatibility with pluralistic approaches which encourage unprejudiced study are matters of vital importance to be considered in the course of the planning process.

A question that should be looked into further in this context is how students themselves, by selecting their own learning objectives, can influence or even independently decide not only how but also what they are to study. This is the key question related to student autonomy in distance study. Individualized learning is not brought about by freedom of pace or even freedom of method and medium if others than students decide the content of study. To what extent is it possible to provide a wide range of study opportunities, with clearly defined and declared study objectives for each small unit, and to make possible a completely free choice of such units for students in individual combinations? Constructive approaches which engage the students in the selection of study objectives have been developed by both Potvin (1976) and Ljoså and Sandvold (1983). Potvin 'denies the institution and the tutor the right to prescribe what the learner should learn and how he is to learn it' (Potvin 1976: 30). How this philosophy is to be practised is worth considering. It is evidently possible only to a very limited extent in studies which have to follow fixed curricula.



# 4

# COURSE DEVELOPMENT – FUNDAMENTAL CONSIDERATIONS

The presentation of learning matter has been described above as one of two constituent elements of distance education, the other being interaction between students and their supporting organization with its tutors, counsellors and its administrative infrastructure. Any discussion about how this presentation occurs, how its goals can be attained and what methods and media are used, should be preceded by a consideration of its basic character. In distance education it is brought about by other means than face-to-face sessions.

## OVERARCHING PRINCIPLES

Evidently (see pp. 23 and 35), the presentation of learning matter cannot be confined to dissemination of information. As an educational endeavour it must engage students in an intellectual activity that makes them try out ideas, reflect, compare and apply critical judgement to what is studied. This necessarily includes making use of insights acquired in various connections and cannot be limited to purely intellectual experiences; there is an affective aspect to be considered, as there is in anything that engages the mind and develops the personality.

It is the task of course developers to assist students' learning by examining the learning matter by argument, reflection in writing or recording, and causing students to reflect. Reflection in this context has been understood as 'a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations. It may take place in isolation' (Boud, Keogh and Walker 1985: 19). These activities are compatible with

personal approaches, bring out communicative aspects, and can lead to conversation-like principles of presentation.

### Learning-matter presentation simulating personal communication

This means more than rejecting information dissemination as the sole function of learning-matter presentation. It necessarily entails consequences for the general approach, the way in which students are addressed and treated. Under no circumstances can students be seen as passive recipients of wisdom conveyed by the medium of the distance-teaching course. Instead, they are partners whose knowledge, experience, and capacity are relied on to contribute to a real and/or simulated communication that promotes learning and the development of new insights.

While it is true that the presentation of learning matter in a pre-produced course, written, recorded, broadcast, or made available in any other way, is technically a case of one-way traffic (to be supplemented by interaction, i.e. two-way traffic), the approach described can simulate informal communication which causes and – in the author's opinion – requires personal rapport between course developers and students. Empathy would thus seem to be an important quality for a course developer. See Swanepoel (1987), according to whom dialogue and personal relationships are necessary prerequisites for education; she states that 'education is primarily a personal relationship which becomes concrete through affective and cognitive means' (Swanepoel 1987: 185).

The author of an Australian (Gippsland Institute of Advanced Education) sociology course states, in an audio tape introducing the study, that in the printed course materials a style has been adopted which 'is rather more personal or chatty than is conventional in social science writing. This should make these books easier to read' (Nation and Elliott 1985: 12). An accompanying research project (based on 'participant observation' and detailed records of telephone conversations with students)

> confirmed the effectiveness of the 'personal style' which had been used in our printed course materials. It pointed out, particularly, that for some students anyway, the 'personal style' broke down feelings of isolation and assisted





> students to take up our offer to use the telephone and other forms of informal contact.
>
> (Nation and Elliott 1985: 19)

### Guided didactic conversation

The present author has long been concerned with the characteristics of distance-teaching courses meeting the requirements indicated and has introduced and operationalized the concept of guided didactic conversation in this context (Holmberg 1960: 15; 1983a; and elsewhere; Holmberg, Schuemer and Obermeier 1982).

My approach to guided didactic conversation as a pervasive characteristic of distance education is based on seven postulates:

1 That feelings of personal relation between the teaching and learning parties promote study pleasure and motivation.
2 That such feelings can be fostered by well-developed self-instructional material and two-way communication at a distance.
3 That intellectual pleasure and study motivation are favourable to the attainment of study goals and the use of proper study processes and methods.
4 That the atmosphere, language and conventions of friendly conversation favour feelings of personal relation according to postulate 1.
5 That messages given and received in conversational forms are comparatively easily understood and remembered.
6 That the conversation concept can be successfully translated, for use by the media available, to distance education.
7 That planning and guiding the work, whether provided by the teaching organization or the student, are necessary for organized study, which is characterized by explicit or implicit goal conceptions.

A basic general assumption is that real learning is primarily an individual activity and is attained only through an internalizing process.

The conversation that can be simulated in a pre-produced, usually printed course is primarily felt to be one between the course developers and the individual students. The former build up an image of the students who are expected to study their

courses and endeavour to address them as individuals. This leads to a simulated 'conversation', which tends to encourage individual text elaboration.

Thinking aloud is a frequently occurring form of text elaboration which has been studied in different contexts (cf. Ericsson and Simon 1980; Chafe 1979, 1980; Graff 1980: 149). Elaborative processing of text, i.e. the interaction of the text content with the prior knowledge of the reader, has actually proved conducive to retention (Weinstein *et al.* 1979; Ballstaedt and Mandl 1982). Whereas a student who does very little elaborating does not secure the new learning matter sufficiently, those who do a lot of elaborating seem to risk having difficulties in retracing the text information in the multitude of connections that they have established. Thus moderate use of text elaboration seems profitable (Mandl and Ballstaedt 1982; see Ballstaedt and Mandl 1982: 5; and Pask 1976b on 'redundant holists' as discussed on pp. 33–4).

Text elaboration has something of a conversational character also when it does not literally mean thinking aloud. See Lewis, who rejects any contrasting of 'conversational activity with more solitary activities such as private reasoning and silent reading', which he characterizes as 'internalized conversation'. 'As we mull things over quietly and in solitude, we are actually holding a conversation with ourselves' (Lewis 1975: 69). This is tantamount to interaction with a text and indirectly, with its author, by means of which the reader influences the outcome and implies affinity to what is called discourse theory (Juler 1990).

If we accept that discourse in the sense of elaborative text processing and 'internalized conversation' represent a useful learning strategy, it is logical to draw conclusions from this to a teaching strategy. In its simplest form this would imply causing students to apply an appropriate extent of text elaboration to their learning.

These are considerations behind my concept of guided didactic conversation, the qualities of which I have described as follows:

1 Easily accessible presentations of study matter; clear, somewhat colloquial language, in easily readable writing; moderate density of information.
2 Explicit advice and suggestions to the student as to what to do and what to avoid, what to pay particular attention to and





consider, with reasons provided; for example, along the following lines: 'Here you may draw the conclusion that . . . This is tricky, however. Compare . . . and consider if what we discussed in Course Unit X causes you to . . .
3 Invitations to an exchange of views, to questions, to opinions and comments.
4 Attempts to involve the student emotionally so that he or she takes a personal interest in the subject and its problems.
5 Personal style including the use of personal and possessive pronouns: I, my, you, your, etc.
6 Demarcation of changes of themes through explicit statements, typographical means, or, in recorded, spoken communication, through a change of speakers (e.g. male followed by female) or through pauses. (This is a characteristic of the guidance rather than of the conversation.)

Using this operationalization of the concept of guided didactic conversation, I have developed a theory implying that course presentations which follow the principles described are attractive to students, support study motivation, and facilitate learning. This is expected to apply to most learners at all levels, but particularly to those with little or modest experience of study and limited independence. This reservation is rejected by Mitchell who insists that 'the principles of guided didactic conversation are relevant in all aspects of education' (Mitchell 1992: 130). As exceptions are foreseen (a minority of students are expected to be indifferent or, in extreme cases, even negative to the style of guided conversation), this is not what the critical–rationalist school of epistemology would call a nomological theory.

I assume that if a distance–study course consistently represents a communication process that is felt to have the character of a conversation, then the students will be more motivated and more successful than if the course studied has an impersonal textbook character.

My main formal hypotheses, based on the general postulates and the assumptions about what constitutes guided didactic conversation, can therefore be summarized as follows:

1 The stronger the characteristics of guided didactic conversation, the stronger the students' feelings of personal relationship between them and the supporting organization.
2 The stronger the students' feelings that the supporting

organization is interested in making the study matter personally relevant to them, the greater their personal involvement.

3 The stronger the students' feelings of personal relations to the supporting organization and of being personally involved with the study matter, the stronger the motivation and the more effective the learning.

4 The more independent and scholarly experienced the students, the less relevant the characteristics of guided didactic conversation.

By three empirical investigations (Holmberg, Schuemer and Obermeier 1982), these hypotheses, as one unified theory, have been subjected to rigorous falsification attempts in the spirit of Popper. These attempts, among other things, caused testing to be done under circumstances as unfavourable as possible to the theory. The tendency apparent in all of the three studies favoured the theory, although no consistent, statistically significant corroboration emerged. The students who took part in the investigation stated that they felt personally involved by the conversational presentations, their attitudes were favourable to them, and they did marginally better in their assignment attainments than the students who took the original course.

Apparently independently of this theoretical approach and its empirical testing, other distance educators have adopted similar principles.

### Learning conversations

Learning conversation is a designation used by Harri-Augstein and her group of scholars to denote

> a form of dialogue about a learning experience in which the learner reflects on some event or activity in the past. Ultimately, it is intended that people will internalize such conversations so that they are able to review learning experiences systematically for themselves, but at the beginning, the learning conversation is carried out with the assistance of a teacher or tutor . . .
>
> It must first of all be said that a learning conversation is not idle chatter, nor is it an exchange of prescriptions, instructions or injunctions. Instead, it is a dialogue on the





> process of learning: the learner reflects on his or her learning with the assistance of a teacher or tutor.
>
> (Candy, Harri-Augstein and Thomas 1985: 102)

There can be little doubt that this approach is less directive and has more of a metacharacter in its relation to learning than my guided didactic conversation. It is concerned with bringing 'to a level of conscious awareness the [learning] strategies and values which were previously implicit' with a view to putting students 'in a position to modify them' (ibid. p. 115). This, to quote from another paper,

> requires three parallel dialogues. Together these reflect the learner's cognitive process back to him, support him through painful periods of change and encourage him to develop stable referents which anchor his judgement of the quality of his assessment. The three dialogues can be described as:
>
> (a) commentary on the learning process;
> (b) personal support of the learner's reflection; and
> (c) referents for evaluating learning competence.
>
> Each of these three dialogues can become internalized, but people differ in the ease with which they can sustain each of them. Effective internalization of the complete learning conversation produces the self-organized learner and the fully functioning man or woman. Such people learn from experience and continue to learn through life. Frozen internal conversations disable us as learners, and it is only when the external conversation is re-established that the frozen process can be revived. Living then becomes an ongoing opportunity for learning.
>
> (Thomas and Harri-Augstein 1977: 101–2)

### The tutorial-in-print

A more directive approach strongly characterizes what Derek Rowntree has called a tutorial-in-print. Like any tutorial it has a conversational character but it seems to be concerned more with knowledge acquisition than with discussing problems, more with down-to-earth suggestions and exhortations than with reflection on the learning.

Rowntree advises course developers to imagine that they are tutoring one individual learner, thus providing a substitute for individual face-to-face teaching:

> Everything you might want to say to this individual will need to be written down, forming what I have called a tutorial-in-print.
>
> This is what you will need to do in your tutorial-in-print if you are to teach your individual learners:
>
> - Help the learners find their way into and around your subject, by-passing or repeating sections where appropriate.
> - Tell them what they need to be able to do before tackling the material.
> - Make clear what they should be able to do on completion of the material (e.g. in terms of objectives).
> - Advise them on how to tackle the work (e.g. how much time to allow for different sections, how to plan for an assignment, etc.).
> - Explain the subject matter in such a way that learners can relate it to what they know already.
> - Encourage them sufficiently to make whatever effort is needed in coming to grips with the subject.
> - Engage them in exercises and activities that cause them to work with the subject-matter, rather than merely reading about it.
> - Give the learners feedback on these exercises and activities, enabling them to judge for themselves whether they are learning successfully.
> - Help them to sum up their learning at the end of the lesson.
>
> (Rowntree 1986: 82–3)

The conversational character of the 'tutorial-in-print' is stressed more clearly in other contexts, for example by Donnachie in a discussion of history teaching at a distance, in which it is said not only to involve 'the teacher in a one-to-one relationship with the student' but also to challenge 'the student in a dialogue with the tutor' (Donnachie 1986: 55). This implies stressing the importance of simulated communication in a way closely resembling my guided didactic conversation.





The same applies to a presentation by Cooper and Lockwood:

> The simulation of a 'tutorial in print' (Rowntree 1975) is the procedure whereby an author regards the student time spent working on his material as time spent by the student in the author's company. In such a situation it is unlikely that an author would expect a student to simply read an exposition from start to finish without reacting to it in some way or producing anything themselves. They may, for example, be asked to recall items of information, define concepts, draw together arguments, justify particular statements, consult other sources, interpret data, compare different interpretations of the same data, work out examples, and so on. In short to exercise certain study skills by which they can construct their own picture of a subject and integrate what they have just been taught with what they had learnt before.
>
> (Cooper and Lockwood 1979: 253)

### Conversation theory

A sophisticated conversation theory has been developed by Gordon Pask, who applies a cybernetic approach to networks of concepts and interaction with a computer; he describes his theory as 'an attempt to investigate the learning of realistically complex subject matter under controlled conditions' (Pask 1976a: 12).

Pask's theory is complicated, indeed. Entwistle, who recognizes its difficulties, provides the following presentation:

> Essentially this theory describes learning in terms of a conversation between two representations of knowledge. In the most familiar situation these representations reflect the cognitive structures of two people, the teacher (or subject-matter expert) and the student. Learning takes place through a dialogue between the two and, in conversation theory, understanding has to be demonstrated by applying that knowledge to an unfamiliar situation in a concrete non-verbal way (often using specially designed apparatus). Reproductive responses based on memory are not accepted as evidence of understanding.
>
> Learning need not, however, involve an interaction between the cognitive structures of two people. The student

> may converse silently with himself in trying to understand a topic, or he may interact with a formal representation of the knowledge structure and supplementary learning materials which have been specially designed to facilitate understanding of the chosen subject-matter area. Such a 'surrogate tutor' is described as a conversational domain in a standard experimental condition.
>
> (Entwistle 1978: 255)

Pask's thinking has been very fruitfully applied and further developed by Kathleen Forsythe, a distance educator with experience of the Canadian Knowledge-Network. Her approach to conversation theory is based on

> second order cybernetics, a relatively new theoretical construct for not only assessing systems and interactions but also how we see ourselves as we interact. . . . The intriguing insight of Conversation Theory is that the inquiry may be between perspectives within the mind of one person and that Conversation Theory enables the mind to deal with a variety of truth valuations. Unlike the functionalist school, where the ontology of dual states of truths is exemplified in true and false, Conversation Theory is a science of process, encompassed by an ontology of many truth valuations which exist as distinct entities and which form their own necessarily dynamic phenomenology.
>
> (Forsythe 1986: 4 and 5)

Forsythe considers instructional design primarily as design for learning interactions and has developed a 'learning system as a new paradigm for the information age' (Forsythe 1985), in which the learner, the learning partner (the teacher) and 'the knowledge that may be the substance of their conversation' (Forsythe 1986: 10) are the basic components. She elaborates this system to facilitate the understanding of the effectiveness of media, on which see p. 85 (Forsythe 1986).

Forsythe's identification of the evocative, provocative, and convocative functions characteristic of 'interactions for learning' can be seen as something of a guideline for a conversational approach to distance education:

> *Evocative.* The conversation with another, or the conversational agent, evokes or calls forth a reaction within the





> participant that is often based on a feeling of awakening or of experiencing. This often comes from experiencing one thing in terms of another – the isophor. In designing systems that evoke interactions for learning, use of isophor is particularly helpful.
>
> *Provocative.* The conversation with another, or the conversational agent, rouses forth a reaction from the participant that is often unsettling or disturbing, often because it represents a perspective or state significantly different from our own. The feeling of provocation is experienced as we feel we must reassess our own point of view in light of the new perspective.
>
> *Convocative.* The conversation or the conversational agent gathers participants together for a shared experience mediated by the conversational agent.
>
> (Forsythe 1986: 22–3)

### Further comments on personal, conversational approaches as guidelines

The personal, conversational approaches are not exclusively applied to distance education but also to the development of study materials for other purposes. Nevertheless it seems to have originated in distance education (see Holmberg 1960). My studies of guided didactic conversation, Nation's of the personal style in course development, and Forsythe's learning system are primarily intended to serve distance education. Further, Sparkes emphasizes educational conversation as a teaching mode in distance education (Neil 1981: 112; Sparkes 1982: 4). An interesting near parallel is what Chang, Crombag, van der Drift, and Moonen, in their plan for the Dutch distance-teaching university, call paradigmatic presentation (Chang *et al.* 1983: 21). See further Morgan's insistence on dialogue (Morgan 1985: 44).

Empathy and personal approaches are thus considered guidelines for presentation of learning matter in distance education. They can do the same for tutor-student interaction in distance education, as will be shown on pp. 125–7.

## CONTENT AND STRUCTURE

In a great number of cases, the analysis of learning objectives and their final definition automatically lead to a description of the course content. In other cases, the objectives will have to be translated into categories of content defined qualitatively and quantitatively. We have to consider internal criteria, i.e. those that intrinsically characterize the subject, and external criteria, which are those derived from students' needs and interests, from society and the labour market. This applies whether the learning objectives have been expressed behaviourally or in a more general way. It is important to specify what students must know, what they should know, and what they might find useful to know; to define this, as far as possible, in terms of what they will be expected to be able to do and under what circumstances they will be expected to perform. It is also useful to specify the manner (orally, in writing, by laboratory demonstration, creation of something, etc.) in which students are to prove their acquired competence. It is no less important, as implied on pp. 41–2, to state aims bearing on such intellectual skills as cannot easily be checked by performance (behaviour), and the affective objectives, if any, so that they may duly influence both the contents and the course structure.

### Learning levels

In the so-called cognitive (intellectual) domain Benjamin Bloom has identified a classical hierarchy of objectives of immediate relevance to course development. He lists six cognitive levels as shown in the pyramid opposite.

When a distance-education course is planned, considerations of the importance of each of these levels for the course under preparation can provide directing influences. See Ray Taylor on the 'Blooming of education' (Taylor 1991). Other hierarchies of interest have been developed. A project-team at Leeds Metropolitan University has in its work on a degree model focusing on the application of 'work-based' learning defined the following stages also presented here in a pyramid on p. 58.

The same team has identified five problem-solving stages:

1 Formulating the problem (involving detection, identification and definition).
2 Interpreting the problem.





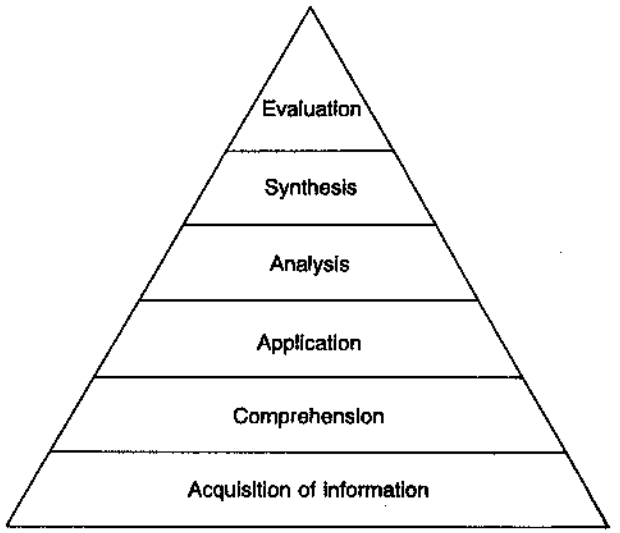


*Figure 4* Cognitive levels
*Source*: Bloom, in Bloom *et al.* 1956

3 Constructing courses of action.
4 Decision-making.
5 Implementation.
(*Mentoring* 1: 7–8)

These hierarchies would seem to offer useful guidelines comparable to Bloom's.

### Structuring learning matter

Structuring the presentation of content selected on the basis of such taxonomies of objectives or other principles is sometimes fairly unproblematic and occasionally a tricky matter. In most subjects there is, as shown on pp. 21–3, a logical order or a conventional pattern which is usually felt to be natural by subject specialists. This order is sometimes such that it must be followed, at least partly, because one part is based on another, knowledge

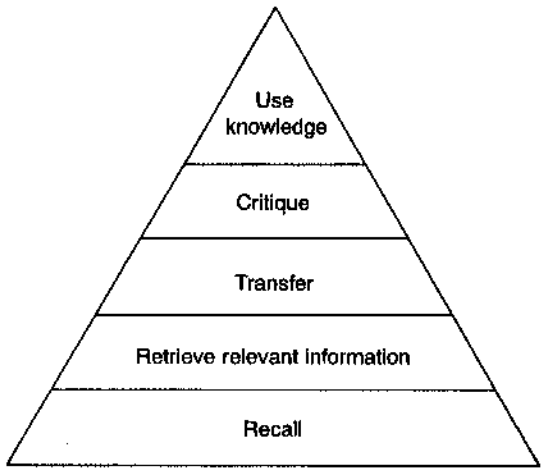


*Figure 5* Stages of work-based learning
*Source*: *Mentoring* 1: 7–8, Leeds Metropolitan University

and understanding of the latter being necessary prerequisites for tackling the former. It is important for course developers to specify what prior knowledge of neighbouring disciplines is necessary (for instance, what mathematics is necessary for a physics or statistics course), to make provision, if possible, for the acquisition of this pre-knowledge, and in any case to make would-be students and administrators aware of the necessary sequence. Concepts and methods within a discipline usually serve as organizers which must decisively influence the structure of most courses. at university level at least. See Hirst's 'logical grammar' (p. 22).

The structuring of any presentation of learning matter is always based on the implicit or explicit goals at which the learning aims, the character of the learning content, and the types of learning concerned. Attempts have been made to develop firm rules for structuring and sequencing content on this basis. These attempts include a search for algorithmic solutions, information mapping





and concept mapping, for which sophisticated methods have been created, such as network analysis, mathematics (T.F. Gilbert's system for developing special skills), and the so-called critical path method (Landa 1976; Horn and Green 1974; Wyant 1974; Rowntree 1974: e.g. Ch. 4). Learning hierarchies and relational networks further exemplify attempts made in this area. Reigeluth, Merrill, and Bunderson (1978) have endeavoured to clarify the discussion about content mapping and content relations in a paper that introduces their own approach to structuring. They provide illuminating examples of learning structures, procedural structures, taxonomic structures, and theoretical structures as 'pervasive content relations'.

### *Inductive and deductive approaches*

A basic question is whether in a course to start out from the parts of a subject area or from the whole, to proceed inductively or deductively. There is, in fact, a philosophical controversy related to structuring principles. The atomistic, associative and inductive approaches, based on David Hume's thinking, have inspired modern behaviourism. Logically, the result of this should be – and among behaviourists often is – an insistence on starting out from the smallest items of knowledge, from the particular, in order to come to grips with the general. This is entirely contrary to the philosophy of Karl Popper and his school of rationalists. Popper rejects inductive methods and in his epistemology starts with the general, i.e. basic abstract assumptions, from which he deduces the particular. Strike and Posner (1976) relate these two contradictory views to education and argue convincingly that whereas the ' "bottom up" approaches to curriculum of the sort represented by the work of Robert Gagné' are based on inductivist thinking, the ' "top down" varieties of the sort often associated with Jerome Bruner' are influenced by the deductive philosophy of Popper and others (Strike and Posner 1976: 115).

A most influential representative of the deductive approach in education is David Ausubel. He suggests the use of 'advance organizers' which

> are introduced in advance of the learning material itself and are also presented at a higher level of abstraction, generality, and inclusiveness; and since the substantive

> content of a given organizer or series of organizers is selected on the basis of their appropriateness for explaining, integrating, and interrelating the material they precede, this strategy simultaneously satisfies the ... criteria ... for enhancing the organizational strength of cognitive structure.
>
> (Ausubel 1968: 148)

Ausubel, who distinguishes advance organizers from summaries or overviews which 'are ordinarily presented at the same level of abstraction ... as the learning material itself' (ibid.), argues in favour of a hierarchical theory of cognitive structure. New learning materials are seen as items which are subsumed under already existing cognitive structures. Early research on the whole gave proof of the effectiveness of advance organizers, but later studies have produced conflicting evidence as to their effectiveness (Macdonald-Ross 1979: 20).

The advance organizers describe the basic concepts of the immediately following part of the course and 'bridge the gap between what the learner already knows and what he needs to know before he can successfully learn the task at hand'. They have proved helpful to students because 'not only is the new material rendered more familiar and potentially meaningful, but the most relevant ideational antecedents in cognitive structures are also selected and utilized in integrated fashion' (Ausubel 1968: 148 and 137). They can thus promote deep learning and make students aware of how they learn. They do this by relating what they already know to the learning task. The research on advance organizers has been summarized in a useful way, and practical guidelines on the when and how of their use have been presented by Marland and Store (1982: 77–81).

Ausubel's thinking thus agrees with the top-down approach as opposed to the bottom-up approach of the behaviourists. In practice both approaches are often applied by one and the same course author and are not always easy to identify as applications of one or the other of the two.

In this context, let us consider language learning concerned with forms of grammar. If, in a course of German, one purpose of teaching and learning is that the student should learn how to use dative and accusative forms respectively in objects of the verb and learn it so well that the application of the principles involved





becomes almost automatic (an inevitable requirement if the learner is to use the language learnt), the following sequence is possible.

1 Typical sentences selected from a text read, from which the student sees which principles govern the usage (as, 'Ich gab ihnen die Bücher. Gab er euch die Bücher? Er gab ihr den Ring. Ich sah sie auf der Strasse. Sie gab ihm den Ring. Sie bat ihn um Hilfe. Schickte er Ihnen keine Blumen?').
2 A discussion of the findings made, specifying the principles illustrated, and explaining, say, why the dative form is used after the verb in five of the sentences and the accusative form in the other two; this can be done in a Socratic way, referring to the students' observations.
3 Exercises of a self-checking character.
4 A discussion of the exercises, relating the individual examples to the general principle discovered according to 1 and 2.
5 New, more complicated examples.
6 A discussion of findings.
7 New self-checking exercises.
8 A discussion of the new exercises relating them to the principle as explained under 2 and 6.

Is the presentation of this item of language learning an example of an inductive or a deductive approach? The procedure suggested is open to alternative interpretations. Superficially it would seem to represent a typical application of the inductive method: particulars (case forms) are looked for and identified, and from these findings conclusions are drawn about general principles. Nevertheless, it would be possible to interpret the initial analysis of sentences as an introduction to the general insight that in German there are case forms of articles and pronouns related to logical syntax. On the basis of this general approach, particular forms are identified and learned. No doubt parallel alternative interpretations occur when the structuring of other presentations of knowledge are studied.

The type of learning discussed would seem to some extent to exemplify what has been called reproductive learning and reception learning. However, it also involves the understanding and application of a principle and thus an element of problem-solving: tracing a direct and an indirect object, its person, gender and number, the correspondence between 'ihr' and 'euch',

'Sie' and 'Ihnen', etc. Thus, it is a case of not only reproductive but also productive learning.

The problem-solving concerned here is limited to the application of principles discovered, explained, and laid down as a codex, which is pertinent because there are, in fact, correct replies that cannot be doubted. The same would apply to some forms of mathematics.

Although in pure rote learning (with which we need not concern ourselves here), it may not matter at all in what order the various items are introduced, i.e. the learning can be done in an unstructured form, much productive learning is of hierarchical nature. Thus, for example, it would make little sense to introduce the object forms of pronouns (the accusative and dative) as above before the subject forms have been learned.

### *Psychological sequencing*

It is the logical structure of the learning content that is decisive for these considerations. Apart from this logical structure, didactic and psychological considerations must be taken into account. A perfect logical presentation is of no avail in a course of study if it is not comprehensible to the students who constitute the target group. A teacher in class does not try to cover all aspects of a subject but limits himself to what the students concerned can benefit from; nor does he try to teach at one time more of a given section of the subject than he expects the students to grasp and remember. Those who develop courses for distance study must observe the same principle to make it possible for the students to digest and benefit from the course. This seems self-evident but is not always observed. When writing or recording, many scholars more or less consciously have their colleagues (and critics) in mind, as a kind of secondary target group, and are thus tempted to prove their scholarly standard by means to which the students are, at best, indifferent and which may even be harmful by creating confusion and uncertainty.

In some subjects, particularly those where the teaching aims at providing the students with certain attainments that need repetitive practice, the requirement that the teaching should be student-centred leads course developers to adopt a kind of concentric method. They give their students a small part of the difficult matter at a time, make them consolidate their newly





acquired knowledge in various ways, support it by bringing in secondary material of both motivating and elucidating types, and also help them to check their knowledge and proficiency prior to bringing in new learning matter in the same subject area. Before this process is completed, another part of the subject is also brought in and treated in a similar way. Then attention is again given to the first topic, with a view to consolidating and widening the students' knowledge, understanding and skill in this particular field. Thus, one body of problems may be dealt with in several study units, along with various other parts of the subject. This means that the authors and other members of course teams identify with teachers and tutors who have to consider the receptivity of their students.

The method described is applied above all in the planning of language courses, in which problems of text analysis, phraseology, idiomatic expressions, grammar, style, phonetics, etc. are often dealt with concentrically. However, fundamentally the same method is found in courses of mathematics (where, for example, algebra and geometry may be taught side by side) and physics and chemistry (where theory, discussion of experiments, and the solution of problems may be brought together). In some cases, the various aspects of a subject are considered in different courses, the units of which alternate in the students' programme of study. From the point of view of teaching method, this application of concentric instruction is only superficially different from the one described earlier.

However, a presentation is seldom really concentric, which would imply nothing but continuous review, discussion, and training in the same parts of a subject, but rather spiral. Ausubel uses the expression 'the spiral curriculum' (Ausubel 1968: 209).

The so-called elaboration theory developed by Charles Reigeluth and his co-workers is a contribution in the spirit of Ausubel. Reigeluth compares his approach with the use of a zoom lens, offering first a wide-angle view and then zooming in on a part of the picture at a time, i.e. operating 'in steps or discrete levels'.

> In a similar way the elaboration model of instruction starts the student with an overview of the major parts of the subject matter, it elaborates on one of those parts to a certain level of detail (called the first level of elaboration), it reviews the overview and shows the context of that part

> within the overview (an expanded overview), it continues this pattern of elaboration/expanded overview for each part of the overview until all parts have been elaborated one level, and it follows the same pattern for further levels of elaboration. . . . To summarize, the elaboration model of instruction starts by presenting knowledge at a very general or simplified level . . . Then it proceeds to add details or complexity in 'layers' across the entire breadth of the content of the course (or curriculum), one layer at a time, until the desired level of detail or complexity is reached.
>
> (Reigeluth 1979: 9)

While Reigeluth agrees with Ausubel in starting by presenting knowledge at a general level, the overview referred to is not identical with Ausubel's advance organizer, but is described as an epitome, apparently implying a small-scale presentation with a single orientation, 'which means that it emphasizes a single type of content' (ibid., p. 10). It should contain a 'generality', some instances of the generality and an exercise giving students an opportunity to apply 'the generality to new instances' (ibid., p. 11).

Reigeluth's approach (along with Merrill's component display theory linking in with it, on which see Merrill, Reigeluth and Faust (1979)) has been applied by Koeymen as a guideline for a Turkish distance-teaching university (Koeymen 1983).

In the cases where problem-solving is the core of the learning matter, the order of presentation will evidently not be hierarchical, as no ready-made edifice of knowledge is to be presented. Here, the beginning is made by the problem and the search will be made along the lines of scholars who have looked for and finally found solutions. Their search can then also be followed when they make errors and correct them, which implies learning by Popperian 'conjectures and refutations' in the spirit of Lehner and Weingartz, as discussed on p. 35.

### *Further approaches*

Attempts have been made to analyse the consequences of organizing a text strictly from the points of view of general subject content, and from special aspects applying to individual content items. Empirical research causes Schnotz to state:





> With a text organized by aspect essentially all learners do integrative as well as comparative processing. With a text organized by object only the integrative processing is done by all learners. In the latter case, comparative processing is optional. Therefore, only some of the learners will engage in it, needing relatively much time. Rate of processing depends on prior knowledge more strongly in the case of organization by aspect than in the case of organization by object, presumably because of the frequent mental switches. Learners with higher prior knowledge seem to have less difficulty with these switches, whereas with low prior knowledge this type of processing tends to be a handicap. Hence, with organization by aspect learning results are affected more strongly by differences in prior knowledge, whereas organization by object seems to be less sensitive in this respect.
>
> (Schnotz 1982: 95)

Schnotz's studies of 'object-oriented' and 'aspect-oriented' texts have been summarized by Picard (1992), who recommends initial object-oriented sequencing followed by aspect orientation since object orientation seems to suit learners with lower prior knowledge while aspect orientation appears to be useful for learners with good prior knowledge.

The use of questions in the text is another procedure applied to structure the learning. Rothkopf initiated a series of studies on the effectiveness of questions placed before the text passages concerned, inserted into them, or placed after them. Not unexpectedly it was found that, whereas introductory questions tend to lead the student towards what would answer them specifically, to the detriment of the study of other parts of the text, questions placed after the text passage have a more general effect, stimulate more careful learning, and lead to slower learning of later passages. The delaying effect seems to disappear gradually, maybe because better study skills have been acquired with the help of the questions.

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> supports, but so far does not add to, the practice of inserting into texts higher-level (not rote recall) questions after the relevant teaching material. This practice was adopted at the Open University in 1969 on grounds of common sense,

> teaching experience and the distilled experience of practical work on programmed instruction.
>
> (Macdonald-Ross 1979: 24)

Reservations have been made by students about the use of inserted questions. See p. 77 below. To the extent that they make students aware of how they learn and direct their attention to reflection, inserted questions are likely to support learning.

While these various approaches are interesting and contribute to our understanding of the learning process, they exert only limited influence on practical educational activities. Whether they apply or not, course developers have to consider didactic as well as logical aspects when structuring a course. A mixture of information presentation, examples, quotations, discussions, suggestions for student activity, and exercises is usually found valuable in the interests of motivation, of variation to counteract tiredness and lagging attention, and of securing the acquisition of knowledge. Inspired by Gagné (1970: 304), distance educators tend to point to the following functions of course materials as being essential:

1 To arouse attention and motivate; the presentation of objectives that are within close reach appears to be of particularly great importance in this respect.
2 To make students aware of the expected outcomes of the study.
3 To link up with previous knowledge and interest.
4 To present the material to be learned.
5 To guide and structure, offering guidance for learning.
6 To activate.
7 To provide feedback.
8 To promote transfer.
9 To facilitate retention.

My list almost entirely follows Bååth's adaptation of Gagné's model (Bååth 1982: 68); see also Lampikoski and Mantere (1976: 13–14), and Ahlm (1972) (the first distance educator to use Gagné's model).

A useful general survey of implications of text structure on text design is provided in Jonassen (1984), in which various theories and approaches to structuring and sequencing are commented on, among them schema theory and elaboration theory (on which see pp. 63–4) While these attempts have not succeeded in





producing generally applicable guidelines (see Shavelson and Stasz 1980), they contribute to the understanding of the problems of structuring learning matter and make rewarding reading.

The resignation expressed as to the possibility of identifying generalizable and always practicable principles for the structuring of course materials should not be interpreted as a rejection of the findings made. Any application of principles must be guided by common sense and intuition, however. In spite of all reservations it must finally be stressed that learning takes place more easily if it is connected with concepts already known and if the knowledge that is being acquired is applied to problems that the student is interested in or becomes aware of. To arrange this, by guiding students through the problem areas, and to help them to find themselves in the situation where they can successfully solve problems of increasing difficulty is an extremely important obligation for course developers. It actually means helping students to attain success step-by-step, thus developing a strong continuous motivating force. The conversational approaches discussed above as over-arching principles are highly relevant also in this context.