

Curricular Perspectives

The general curriculum literature has been reviewed by Miller and Sellers (1985), who suggest that three major positions exist: transmission, transaction, and transformation. These positions represent what they term “meta-orientations” in that each comprises a cluster of more specific models (see, for example, Miller 1983; Baath 1979; and others). As well, each is associated with varying social, political, and economic positions. Although these broader matters are not discussed here in any detail, they inform the literature on curriculum development.

The Transmission Mode

The function of education in the transmission mode is to convey facts, skills, and values to students. These are transmitted in one direction, with an emphasis on control and prediction of the learning process. Consistent with principles derived from behavioural psychology, student skills are analysed into component parts and ordered in the form of a skills hierarchy. These sequences are then developed through specific instructional strategies which define not only the student’s response but also the direct-instruction role of the instructor or course designer. There is a strong disciplinary base to this approach: instructional designs adhere to the subject area as expressed in (usually) textbook format. In many ways, this approach involves the application of a mechanistic view of human behaviour to curriculum planning. The work of Gagne (Gagne and Briggs 1979) typifies the transmission position to the extent that an analysis of the learning task forms the basis of sequenced instructional plan through which individual students must progress.

The Transaction Mode

In education as transaction, the individual is seen as purposive and intentional and, in the role of learner, as being capable of rational problem solving. The central element of

transaction is that learning involves a dialogue between the learner and the curriculum, during which the learner reconstructs knowledge through dialogue. This process also includes interaction with other individuals engaged in learning. In fact, the second element of transaction — the development of instructional strategies that facilitate problem solving — is placed in a social context that involves not only situations but people. Further, application of problem solving is placed within the context of the democratic process: the so-called “democratic citizenship” orientation.

The origins of the curricular framework for the transactional position, while acknowledging the academic disciplines, are attributed to Piaget’s developmental psychology which emphasises interaction between the learner and a stimulating intellectual environment; and to Dewey’s pragmatism or the application of rational (scientific) principles to a broad range of problems. There is as well a political aspect. Miller and Sellers (1985) consider the transactional approach to be associated with reform efforts that ensure minority groups have equal access to educational opportunities.

The Transformation Mode

The third of Miller and Sellers’s curricular orientations focuses more on personal and social change than do the others. Philosophically, the transformative view draws on the emerging environmental paradigm of interdependence. The transformation curriculum comprises various topics, but these possess a thematic structure that is not interpretable when disassembled into component parts. In instructional design the learner and the curriculum are seen as interrelated, at least when determining meaning and understanding. This holistic view reflects the influence of humanistic psychology and the associated assumption that individuals need to seek personal fulfilment and that they can do so through the learning process.

The social change strand of transformation argues that educators must adopt a more critical view of the role of schools in society. Political ideology is an integral part of transformation, where it is given a directly social reference and set of implications. For example, the work of Michael Apple, Paulo Friere, and others assume schools as institutions must be leaders in social and political change.

The progression from transmission to transformation reflects basic differences in the presumed purpose of education. Each position draws upon a variety of social, economic, and philosophical sources for its justification. The defining characteristic of each stance is, however, the particular role assigned the student in the instructional process. Essentially, the transmission-to-transformation continuum traces movement towards a student-centred view of learning. And to a considerable degree it describes parallel developments in the area of distance education. Here, various definitions of open learning have evolved, largely in curricular and instructional design. Debate over the meaning of “open learning” and its relationship to “distance education” has continued for some years, and has been most closely argued in the journal *Open Learning* with Lewis’s (1986) article followed by Rumble (1989), and the related discussion involving Jevons (1986) and Peters (1989). Emerging from these exchanges is a distinct shift towards a student-centred view of open learning.

This development in the meaning of “open learning” has been presented in some quarters not as a change but rather as a difference. Kember and Murphy (1990) distinguish open education from student-centred learning on the basis of institutional or administrative features and curricular features. For example, open learning includes: open entry; variable start and finish dates; freedom of study location; and the availability of a tutor. Student-centred learning possesses a flexible curriculum sequence; negotiated objectives and content, learning method, and assessment; and, finally, a choice of support. Open

learning, then, is designed to remove barriers to participation while student-centred learning concerns itself with supporting students in their academic efforts by increasing curricular and instructional flexibility.

A Curricular Comparison

Changes in institutional mandate and organisation are important indicators of change in distance education. However, the fundamental nature of these changes is most obvious in the curriculum area. For example, the notion of student-centred instruction lies at the heart of a distinction proposed by Boot and Hodgson (1987) between “dissemination” and “development” approaches to distance education. While essentially curricular in its concerns, the distinction between dissemination and development relates directly to differences between the established industrial model and the emerging distributed organisation described by Kaye and Rumble (1991). Additionally, the curriculum orientations described by Miller and Sellers (1985) parallel the movement from dissemination (transmission) to development (transaction-transformation). To the extent that these approaches coincide, they are useful in tracking and informing the increasingly numerous references to student-centred instructional designs in the distance education literature.

Dimensions along which this curricular change may be assessed have been developed by a number of authors in the general educational literature. For example, Berlak and Berlak (1981) propose various curricular dilemmas which, when grouped, comprise three aspects of the learning situation: student characteristics, knowledge acquisition, and the conditions of learning. Together, these determine the relationship between teacher and learner or, in the distance education setting, the relationship between institution and learner. Boot and Hodgson’s (1987) profile similarly describes the curricular and instructional features which contribute to an altered role for students in distance education. The major dimensions and relevant comparisons of their profile are outlined in Table 3.

Table 3. Boot and Hodgson’s Curricular Comparisons

Approach	Curricular Dimensions		
	Knowledge	Student Characteristics	Conditions of Learning
Dissemination Model	Commodity	Extrinsic Motivation	Universal
		Learning Style	Private
Development Model	Process	Intrinsic Motivation	Local
		Learning Strategy	Public

From Boot and Hodgson's perspective, the questions and choices that surround knowledge issues involve information as commodity or, conversely, attributing personal meaning to the array of knowledge, skills, and procedures that the student encounters and engages with in the course of obtaining a university education. While the dissemination development dichotomy proposed may appear extreme, it is consistent with the recent literature on institutional change (see, for example, Tait 1988; Apple 1992) and serves to make the necessary curricular arguments within an altered perspective on the needs of students who themselves are responding to dramatically different social and economic imperatives.

STUDENT SUPPORT SERVICES: ELEMENTS OF A RESPONSIVE MODEL

The major dimensions of Boot and Hodgson's (1987) comparative summary are further elaborated here as a means of describing the elements of a responsive support service model; that is, a system whose features are consistent with the institutional shift towards a developmental orientation. These changes suggest a view of student outcomes as comprising something more than a repertoire of discrete skills. Complex patterns of knowledge acquisition and use are necessary acquisitions for students in order to define and solve the variety of problem types encountered in school and non-school settings. Furthermore, knowledge acquisition and application involve interpretation of what the individual and the situation needs. This constructivist approach to learning is discussed here along with recent research on student characteristics. As well, some of the implications of studies on learning styles and "approaches to learning" are examined. These comments on the characteristics of students and their active role in the construction of knowledge is preliminary to a discussion of the conditions of learning necessary to the development of understanding. Of particular interest to the consideration of student support models are activities that complement the instructional design process by promoting interaction among students. Interaction possibilities include mediated instructional situations such as audio or computer conferencing formats, and face-to-face settings such as study centres. The shared characteristic of both mediated and face-to-face instruction is the cooperative nature of the interactions that occur in each.

Knowledge Acquisition and Understanding

Most distance education programmes have been developed within the instructional systems design framework, which emphasises task analysis and individual student differences (Shale 1987). However, recent analyses of instructional models (see, for example, Jonassen 1992; Wilson and Cole 1991) indicate that curriculum development increasingly is moving away from its exclusive focus on either individual differences among students or the form and structure of the subject matter towards the actual process of interaction between both. Moreover, it emphasises the necessity of a social context for this interaction. A shift away from the objective and analytical treatment of learner and subject-matter marks the replacement of essentially behaviourist principles with those of cognitive science. More specifically, it introduces elements of the constructivist position into the curriculum design process (Prawat 1992). Constructivism makes a number of assertions that force reconsideration of the nature of knowledge acquisition and use and, in doing so, constructivism redefines the responsibilities of the institution and the learner in acquiring understanding.

Learning is a process of actively interpreting and constructing knowledge

Unlike the instructional system design approach, which assumes the curriculum represents a collection of information and ideas all learners must adopt as an objective representation of the discipline they are studying, a constructivist view allows learners to interpret the information and construct their own mental representations of “reality”. It is further assumed that the mental representation constructed will reflect the individual’s personal history and present situation. Jonassen (1992, 9) has contrasted the use of symbols under objectivist and constructivist models. In the objectivist case, symbols are seen to represent reality and the individual’s internal representations are of that external reality. In the constructivist case, symbols are tools with which the individual constructs reality; and symbols, then, are representations of an internal reality. While the objectivist-constructivist distinction highlights differences in some of the assumptions underlying current and prospective design and tutoring practices, it also marks a debate within the constructivist camp (Moshman 1982, Bruner 1990). But these differences over the (internal or external) source of mental representations tend not to greatly influence practice (Olson 1992). Constructivism generally argues — as Apple (1992) did for textbooks — that learners interpret information in the context of personal experience, thus adding a uniquely individual character to their understanding.

There remain among constructivists design differences in the value of, for example, determining objectives or assigning that responsibility to the student. Jonassen (1992, 11) suggests that statements of objectives should function as a “negotiating tool for guiding learners during the learning process and for self-evaluation of learning outcomes”. Jonassen also admits that this is difficult in the case of training designs, which typically support performance goals. Nor is determining an appropriate role for the instructor in organising information a straightforward matter. The use of scaffolding activities in instruction (or tutoring) provides one such instance. Their value has been demonstrated in cases where students possess little related background information or lack procedural prerequisites. But an extreme position would argue that students must be free to generate their own structures. Pressley, Harris, and Marks (1992) suggest instead that a moderate constructivist view of learner autonomy (or, conversely, instructor control) is necessary for effective instructional design. Jonassen (1992) similarly supports a balanced view towards introducing constructivist assumptions into the instructional equation. He gives a useful example:

... the outcomes of air traffic controller training probably should not be individualistic or primarily constructed, yet designers must recognise that controllers’ perceptions of their roles and functions will differ somewhat.

Constructivist designs and instructional exchanges require that particular contexts be recognised. The extent to which these are included will depend, however, upon a number of factors, including the knowledge domain of the subject area and the nature of the problems encountered in that area (see, for example, Arlin 1986; Prawat 1992). Certainly procedural and declarative knowledge bases are important to both air traffic controllers and sociology majors, but in different proportions. Moreover, the strategies developed to deal with problems in these fields will differ. One would expect problems encountered in the sociological field to be less clearly defined, requiring an “identification” process rather than a “solution” process (Nuy 1991; Candy and Crebert 1991).

Knowledge acquisition and application are not separable processes

The problem of transfer has always presented educators with difficulties. One of the assumptions guiding instructional practice has been that higher-order skills and abilities — those thought to mediate processes such as problem solving and critical thinking — are more likely to transfer to other parts of the curriculum or to out-of-school performance than lower-order factual or procedural acquisitions (Perkins and Salomon 1989; Prawat 1992). However, little evidence supports this position; and its assumption that knowledge is independent of the situations in which it is acquired or used is questionable (Larkin 1989). The alternative view of this “horizontal” transfer would see a greater connection between the knowledge to be learned and the arena or arenas of application. The term used by Brown, Collins, and Duguid (1989) to describe this relationship is “situated cognition”. Learning is assumed to occur most effectively in context, and that context becomes an important part of the knowledge base associated with learning. More specifically, the skill or concept to be learned acquires meaning from the situation in which it was used. The situation thus becomes an important part of what one knows or understands about the particular skill or concept. It is necessary, according to these authors, to embed learning in real-world activity.

Prawat’s (1992, 378) caution against an over-emphasis on the meta-cognitive skills and strategies of application adds an important qualification to the promotion of cognitive skill. In Prawat’s words:

If a concentration on the “syntactic” or “how to” aspects of thought leads us to ignore more substantive issues (i.e., what it is that we want students to think about), then the focus clearly is counterproductive. Ideas, being more substantive by nature, may be a more important resource for promoting thought than thinking skills per se. . . . Ideas play both an assimilative and accommodative role, allowing individuals to build on old information while continuing to search the environment for new information that leads to increased understanding.

A further development of this position is that ideas are created through a social process: the interpersonal communications and actions of a pair or group.

Individual knowledge constructions have a social referent

It is necessary to go beyond the interaction between learner and instructional material to determine how meaning is constructed. Apple’s (1992) account of the manipulation of texts indicates the importance of the social structure in personal knowledge acquisition. Rogoff (1990), Resnick (1987), and other “social cognition” researchers recognise the social embeddedness of the individual in arguing that a good deal of knowledge is determined by the community in which it was experienced. Interpersonal exchanges or some form of dialogue are necessary to establish a consensus of meaning about disciplinary knowledge (Prawat 1992). While acknowledging the individual character of learning, some socially negotiated meanings are essential to the implementation of constructivist principles. A completely individualistic view of thought is inoperable in a formal education system (see, for example, Jonassen 1992; Olson 1992; Bereiter 1990). Brookfield (1987) offers an example of the need for a social referent in his model of critical thinking. A five-stage sequence is proposed: a triggering event, an appraisal of the situation, an exploration to explain anomalies, the development of alternative perspectives, and an integration of perspectives into the fabric of living. As Garrison (1992) points out, the model begins and ends in the external world, in between which are the three phases of personal reflection. It is during the integration phase that individuals

act upon their perspectives by sharing and interacting with others. The validity of personal interpretations is determined in a social setting with other people (but see Pask 1976).

Garrison (1992, 139) refers to the learner's responsibility to construct meaning and to justify that meaning through critical discourse with informed others. Entering into dialogue with "informed" others suggests an obvious role for the instructor but Garrison also introduces the idea of shared control. To the extent that the learner collaborates with others, a measure of control over the process is surrendered. In the validation process the learning community is assumed to be a supportive environment in which the individual can explore ideas, ask questions, and make mistakes (Prawat 1992). The necessary conditions of learning for a constructivist model to function will be dealt with later as a discussion of the conditions of learning necessary to gain understanding.

This brief discussion of the three dimensions of the constructivist approach to curriculum and instruction has set out some of the key ideas and basic references in the literature. Characteristics of the learner, assumed to be most relevant to a learner-centred, constructivist approach are discussed below.

Student Characteristics

Marton and Svensson (1979) characterise learning in three dimensions, all of which centre on the learner:

- (1) the learner's awareness of the learning act;
- (2) the learner's approach to the subject matter; and
- (3) the learner's awareness of the context in which learning occurs.

The learner's awareness of the learning act refers to the individual's purpose for learning. This concern with purpose or goals is the subject of much recent research in the area of motivation as a means of explaining the sense of agency that is a part of the active learner's profile. The relationship between the student and the material to be learned is considered as either a matter of style or strategy. As style, the approach to learning that a student adopts is influenced by the cognitive makeup and disposition of the individual; or, to the extent that the preference is possible — as in the case of choosing to learn in isolation or as a member of a group — style appears more socially determined. Recently, research has turned to explain the strategies students use given different learning tasks. Both the dimensions of awareness of the learning act and approach to the subject matter are discussed here. Research on the influence of context on learning is dealt with later in the discussion of conditions for learning.

Agency and Goal-Directed Behaviour

It is often stated that distance learners lack the support of the traditional campus and, as a consequence, require a greater sense of purpose in order to persist and achieve. Much research effort has been directed towards determining the motivational basis for successful learning at a distance. For the most part, motivation has been conceived as either intrinsic or extrinsic. In addition to this standard distinction, which is taken up below, a somewhat different interpretation of purpose appears frequently in the adult and distance education literature. These are found in enrolment or "participation" studies. Beaty and Morgan (1992) and Olgren (1992) distinguish between the task-specific focus of most motivation analyses and the more general reasons individuals have for engaging in study.

The latter, general reasons for engaging in study, are referred to as "orientations to study" (Gibbs, Morgan, and Taylor 1982) and include academic, vocational, personal, and social reasons. Academic and vocational goals represent obviously distinct directions; and personal development reasons for enrolling typically are categories for those who do not seek accreditation. Social reasons for enrolment are expressions of a desire for companionship. But people enrol for a variety of reasons that reflect their personal situations and these may intersect (Parkinson, Swain, James, and Payne 1982). Social and personal goals can, for example, overlap or complement the traditional distinction between academic and vocational learning in ways that are important to the curricular changes we have been discussing. A personal motivation implies an intellectual curiosity that translates into important differences in study behaviours, whether directed towards academic or vocational ends. And an inclination for the company of other learners is prerequisite for group and cooperative learning. Research to date, however, maintains the existing division among statements of educational purpose.

Reasons for participating (other than social reasons) are further differentiated as to the locus of motivation: either intrinsic or extrinsic. Recent work in the area of motivation attempts to elaborate on the internal sources of motivated behaviour. Two such research theories are discussed below. The first deals with attribution analysis, a well-established theory. The second deals with the role of goals or task values in setting achievement-related patterns of behaviour. The section concludes with a discussion of more specific learning goals, drawing for the most part on the adult education literature.

Attribution theory (see, for example, Weiner 1985) has been a principal concept in social psychology for a number of years. It attempts to explain achievement-related behaviours in terms of expectancy and affect. The antecedents of these predictive constructs are specific attribution patterns that individuals use to explain the causes of academic success or failure. For example, students may state the cause of their academic successes or failures in terms of locus of causality, stability, and volitional control. The particular attribution pattern that students display influences their assessment of the likelihood of future success or failure and the affective reaction (pride or shame) to these outcomes. The resulting expectancy-value product predicts achievement-related behaviours such as attention, concentration, and persistence. To the extent that a student's behaviour results from such causal analyses, it is possible for instructors to shape their perceptions of the relationship between effort and outcome (Dweck 1992). An awareness of effort-outcome covariation in their study and learning places students in a position of much greater control and responsibility (see, for example, Nicholls 1979). This is a reasonable argument for volitional and rational study behaviour. However, Pervin (1992) questions the degree to which people exercise volitional control over their activities. Pervin suggests that, far from being a breakdown in control and a loss of autonomy among a few individuals, expressions of "irrational" behaviour are common and chronic although not usually debilitating. As an example, Pervin (1992, 164) recounts his experiences with students:

Hardly a student does not report being bothered with some such (volitional) problem, frequently citing such difficulties as endless procrastination. . . . Rather than being true of a limited few, I would venture to suggest that breakdowns in volition are a part of virtually all of us.

However, attribution analyses do offer an explanation of an individual's view of his or her academic or vocational performance. They also serve as a means of predicting future achievement-related behaviours, at least one based on the assumption of expectancy-value theory. The practical utility of attribution analyses lies perhaps in the information

they provide about the individual's perceived basis for achievement, because this allows causal explanations to be redirected to the necessary relationship between effort and outcome.

Attribution studies represent one line of motivation research or, more accurately perhaps, one aspect of a general research effort that is designed to explore the impact of efficacy beliefs on achievement behaviour (see, for example, Bandura 1982; Locke and Latham 1990). An alternative approach to the study of motivation has emphasised the influence higher-order goals (or goal categories) exert on a range of behaviours that contribute to achievement. This study of higher order goals by Nicholls (1979) and Dweck and Elliott (1983) has led to the proposition that people develop two achievement orientations that are related to how they perceive ability. These are developed in childhood and as a consequence of different school experiences. Some children judge ability in relation to previous performance and believe that additional effort actually can increase their ability. Others define ability as relatively stable and come to differentiate ability from effort. In fact, the relationship becomes an inverse one: the more effort expended, the less ability one possesses. The former view fosters a task-involved goal orientation while the latter promotes a performance (or ego-involved) orientation that demands the person demonstrate more ability than others. The performance orientation can have quite debilitating consequences for those children who do not do as well as their peers. One of the problems with the analysis of broad motivational categories concerns their stability or "fixed" nature. Performance and learning goal orientations appear to be formed early in the child's school life and reflect assumptions about the fixed or malleable nature of intelligence (Dweck and Leggett 1989). However, Dweck and Elliott (1983) describe learning and performance orientations as being determined in achievement situations that, respectively, emphasised mastery or competition. How amenable these orientations are to change, once established, is not well documented but presumably the problematic ego-involved goals would respond positively to more congenial instructional conditions.

Wigfield and Eccles (1992) suggest that goal and performance orientations influence the courses students choose. Performance goals will be more prominent for students who wish, for example, to become engineers and hence enrol in math as a prerequisite for engineering school. In some cases, they may opt for the easiest available course to enhance the likelihood of receiving good grades. There are, however, more positive curricular implications of goal orientations among students. Where individuals are task oriented, they will tend to enrol in courses from which they can derive the most intellectual benefit. Where possible, these students enrol in courses to fit their interests and they tend to strive more (see, for example, Atman 1990), have higher perceptions of competence for the task, and have more positive feelings of satisfaction towards the task.

Closely related to academic, vocational, and personal statements of reasons for enrolling, perhaps even embedded within them, is a more specific set of elements that define what Saljo (1979) initially termed "conceptions of learning". Essentially, these represent how students understand the learning task. Subsequent research and analyses have organised students conceptions into two categories:

Reproducing Goal

- Increasing one's knowledge
- Memorising and reproducing
- Applying facts and procedures

Transforming Goal

- Understanding
- Seeing something in a different way
- Changing as a person

The notion of understanding not only as an outcome but as a process reinforces the constructivist view of personally meaningful knowledge as a goal; and the last transformative statement — “changing as a person” — introduces the developmental character of the scheme.

Understanding is a concept that has received considerable attention in the philosophy of education literature (Bereiter 1992; Okshevsky 1992). However, Nickerson (1985) and Entwistle and Entwistle (1992) reviewed the educational psychology and student learning literature and both concluded that understanding was not a well-researched notion despite its centrality to education. There have been some recent attempts to explicate the concept. Burns, Clift, and Duncan (1991) found students adopted either a “knowledge” or “coherence” orientation in their study of science. The latter orientation comprises the network of relationships individual students construct between chemistry concepts. These establish order within the subject and bring coherence to the isolated bits of information. The notions of coherence and structure or interconnections are repeated in the work of Entwistle and Entwistle (1991; 1992). Similarly, Greeno and Riley (1987) refer to the importance of developing generalised representations in problem solving, which they describe as implicit theoretical understanding.

One of the most striking features of this list of student perceptions is its developmental character, especially apparent in the reference to “changing as a person”. Beatty and Morgan (1992) conducted a six-year longitudinal study with a small number of open learning students to trace their intellectual and personal development. The observed changes in students involved a greater sense of responsibility for their own learning and growth in their awareness of the nature of knowledge and its construction. This involved, for example, their becoming more critical of the information and arguments presented in their course material. Other indicators of change included their understanding that analysis and argument did not require correct answers. In this respect, the distance education students in the study resembled the younger, traditional students in Perry’s (1970) developmental study and the female students in the Belenky et al. (1986) research.

Styles and Strategies

Individual differences among students have been widely used to predict outcomes such as persistence and achievement. Among the more obvious changes in the research literature is the move to include data about how students perceive themselves when constructing student profiles. While individual difference variables such as cognitive style remain an important means of characterising groups as well as predicting their study behaviour and performance (see, for example, Thompson 1983), increasingly the focus of research interest has turned to more complex patterns of study behaviour. Together with the individual’s awareness of the learning process — their sense of intellectual purpose or the set of specific goals they are pursuing — an awareness is needed of the appropriate means to employ in pursuit of these goals. These may more accurately be characterised as strategies rather than styles. As developed through the

approaches to learning framework (Entwhistle 1991), they fulfil the important task of explaining the means by which students come to understand the ideas contained in their course materials.

Cognitive Style

Recent reviews of the literature reveal a growing dissatisfaction with the utility of individual difference variables in general, and cognitive style indicators in particular (Tobias 1987). Not only do they lack the predictive consistency required of research, but practitioners cannot readily employ style information in their instructional designs and decisions.

Earlier work on aptitude-treatment interactions failed to produce findings that could be reduced to general rules (Cronbach and Snow 1977). Nor has the more recent cognitive style research translated into instructionally useful applications (Curry 1990). Joughin (1992, 13) has examined field dependence-independence in relation to adult learning and finds some encouragement for continued research, but not as a matter of priority:

... after 40 years of research into cognitive styles in relation to children, the educational implications of cognitive style remain unclear. It is suggested that a similar fate awaits any extension of that research to adult learners.

Proponents of the individual differences approach have, however, elaborated the concept, and in a more broadly conceived form usually termed "learning style", it continues to serve as a subject of research. (Dunn et al. 1989) consider learning styles to be biological and developmental characteristics that affect how students learn. However, Dunn et al. include a wide range of factors under the learning styles label: motivation, on-task persistence, and the kind and amount of structure required, to name only a few. This degree of inclusiveness departs from the established trait notion of cognitive style. Sociological preferences for individual or cooperative learning conditions as well as dependence on the instructor also form part of their definition of learning styles. Grasha (1984) has developed an instrument to assess style for (among others) collaborative, independent, and competitive preferences. These dimensions do correspond to instructional situations and designs that are fairly well established (see, for example, Johnson and Johnson 1975); however, the correspondence between instructional design and social preference or, more specifically, preference for particular learning conditions, has not been extensively examined in the distance education field (Sweet, Anderson, and Halenda 1991).

A somewhat different approach has been taken by Atman (1987), who relates style to motivation through a consideration of conation and Jungian type elements or, more precisely, aspects of the Myers-Briggs inventory. "Conation" is defined as goal-directed behaviour or "striving". Atman combines the two elements to determine a "goal accomplishment style". The purpose is to identify the ways students manage information, mobilise their energy, and use their time in order to develop interactive, individualised orientation programmes (Atman 1990, 149). Atman suggests that the availability of telecommunications technology represents an environment that will allow type indicators to be used to develop individualised programming. One might observe that the practical aim of individual difference research such as Atman suggests has been the construction of more efficient, more highly individualised instructional programmes; and to the extent these efforts have succeeded, students have been further isolated. As will be discussed in subsequent sections, the educational promise of technology is its ability to enhance interaction rather than to individualise students further.

The developmental experiences of women as learners were examined by Belenky et al. (1986) in their study of gender differences in knowledge construction. They describe as an “emancipatory journey” the progress of women through university from a state of silence to one of constructed knowledge. They posit a sequence of stages, defined by the relationship between the learner and the material to be learned, that moves towards greater intellectual maturity, necessarily involving knowledge of self as well as the ideas under study. But it is a progression so surrounded by political and social constraints that it is difficult to determine a uniquely female perspective, at least for some critics (Briskin and Coulter 1992; Code 1992). The process of connected learning illustrates this difficulty. As described by Belenky et al. (1986, 113), connected knowing is essentially social, involving others in the search for meaning: connected knowers “develop procedures for gaining access to other people’s knowledge. At the heart of these procedures is the capacity for empathy”. Connected knowing is contrasted with separate knowing, which characterises established forms of knowledge and ways of finding truth, broadly termed “critical thinking”. Critical analysis, debate, and generally adversarial methods are used. The distinction between separateness and connectedness has been advanced as a gender difference in the feminist literature by Gilligan (1982), Lang-Takac and Osterweil (1992), and others. As an approach favoured by women, connected learning may be seen as a learning style or, alternatively, as an intellectual state or stage of development (Holland 1988). Belenky et al. (1986, 102) appear to stress more the developmental aspects of knowing, elaborating a framework established by Perry (1970); and they do not assign gender differences to a preference for connected knowing:

Connected knowing is not confined to the poor, the uneducated, or the soft-headed. Nor is it an exclusively female voice. . . . Separate and connected knowing are not gender-specific. The two modes may be gender-related: It is possible that more women than men tip towards connected knowing and more men than women towards separate knowing . . . but we know of no hard data . . . bearing directly on this issue.

The argument for gender differences in preferences for separate-connected learning styles has been made subsequently in the distance education literature by Burge and Lenskyi (1990) and by Kirkup and von Prummer (1990). Kirkup and von Prummer offer some empirical data in support of their interpretation, as well as the additional thought that nurturing pedagogical practices and congenial learning environments developed specifically for women’s studies courses may be of value in defining favourable learning conditions for other courses and participants, including men (1990, 10).

Connected knowing as presented by Belenky et al. (1986) appears as a point along a continuum leading to a more obvious “voice”; and although its nature as a state, stage, or process is never clearly delineated, connectedness nevertheless is directed towards and fundamentally engaged in the task of constructing knowledge:

It is in the process of sorting out the pieces of the self and of searching for a unique and authentic voice that women come to the basic insights of constructivist thought: *All knowledge is constructed, and the knower is an intimate part of the known.* . . . [emphasis added]

The description of “constructed knowers” that Belenky et al. (1986, 137) have offered is consistent with a trend in the literature on learning styles towards a view of learning as the development of understanding --- an outcome that, as previously discussed, is less easily defined and less predictable than performance on standardised tests, but no less in need of explanation.

Approaches to Learning

Explaining the pursuit of understanding is one of the aims underlying a body of research usually termed “approaches to learning” (Entwhistle 1991). As initially developed, the approaches to learning concept attempts to distinguish between deep learning and surface approaches to reading text. Students who employ a deep learning approach seek the author’s meaning and critically evaluate the arguments contained in the text. Moreover, the material is interpreted against personal knowledge and experience. Surface learning strategies attempt to reproduce and, in some cases, simply memorise information. And usually the information is selected to satisfy assessment requirements. Although the types of questions asked on the follow-up examinations influence the strategy students adopt, most students who have initially adopted a deep learning approach display a more flexible approach than those who prefer a surface strategy (Marton and Saljo 1976).

Further research and instrument development has elaborated the original concept (see, for example, Biggs 1979; Entwhistle and Ramsden 1983). The “approaches to studying” inventory, for example, comprises three scales which assess deep, surface, and what is termed a “strategic” approach. The strategic approach consists of the intent to maximise performance and grades through the efficient allocation of study time and effort. Ramsden and Entwhistle (1981, 371) describe it as an “awareness of implications of academic demands made by staff”. So it is a form of “school-wiseness”, an understanding of how the education system works and how the individual can best respond. The strategic approach may invoke either deep or surface learning strategies depending on what the situation demands. Even a fourth orientation has been identified “study pathologies” (Entwhistle 1991). Despite all these developments in the original approach to learning concept, it is still deep and surface learning strategies that are at the core of strategy scales. The deep and surface learning strategies and their elements are displayed below (Entwhistle and Entwhistle 1992):

Deep Approach

- Intention to understand for oneself
- Interacting vigorously and critically with the content
- Relating ideas to previous knowledge
- Integrating components through organising principles
- Relating evidence to conclusions
- Examining the logic of the argument

Surface Approach

- Intending to reproduce parts of the content
- Accepting ideas and information passively
- Concentrating only on assessment requirements
- Not reflecting on purpose or strategies
- Memorising facts and procedures
- Failing to distinguish principles or patterns

Other variables are assessed by the Ramsden and Entwhistle (1981) instrument and its adaptations. Associated with the deep learning strategy are behaviours such as an active questioning of the material or instructor and an organised approach to relating information and the logical use of evidence. As well, an intrinsic motivation is found in students practising deep learning. With surface learning, quite different behaviour tends to be practised. Motivation is extrinsic, study routines are disorganised, evidence is not logically related to conclusions, and there is an “overcautious reliance on details”. Too great a concern with detail has been termed “improvidence” and reflects what Pask

(1976) termed a “serialist strategy” — an attempt to master procedural detail using a step-by-step approach. The excessive use of the serialist strategy means that improvident students are unable to see the way in which different elements of knowledge relate to one another to form an integrated whole, an essential feature of understanding (Kember and Harper 1987). Numerous studies have examined the effect on achievement of applying a deep or surface learning strategy. Generally, deep strategies are associated with the development of meaning and the attainment of understanding.

Kember and Harper (1987) also studied the relationship between strategy and persistence among distance learners. The results of this study indicate that persistence is linked to the use of a deep learning approach (see also Kember et al. 1991).

Other research has assessed the influence of learning conditions on how learning strategies are used. Meyer (1991), for example, has adopted the term “study orchestration” to describe the interaction between perceived learning conditions and strategy use. Students adjust their strategy selection to fit their perceptions of the learning environment. This process, which Meyer and others have studied (see, for example, Entwistle and Tait 1990), allows the adjustment of learning conditions to influence students in their choice of strategy. Nuy (1991) examined whether students appreciate their learning structures and how they approach study strategies in a problem-based curriculum. In this case, the learning environment structures were more refined than most studies. They were defined as content, organisation, and social structures referring, respectively, to the degree of control students exercised over the subject matter, how they managed their study time, how they determined the purpose and sequence of study and, finally, the extent and nature of communication among students. Meyer, Dunne, and Sass (1992) propose the tutoring of students in meta-orchestrations, the awareness of different concepts of learning (Saljo 1979), and the choice of appropriate and inappropriate strategies (for example, improvidence). Instructing students in the ability to perceive anomalies between learning goals and contexts and then adjust accordingly represents an attempt to give students a control mechanism. Such control would monitor and regulate their problem-solving activities (Wilson and Cole 1991).

Conditions of Learning

Developments in distance education often employ the notion of differences among the generations to chart changes in the field. Usually first, second, and third generations are established. All are related to advances in either or both educational technology and instructional design. Nipper (1989) and Bates (1991) stress the impact of communications technology, and Lauzon and Moore (1989) couple communications with computer-aided learning to propose a fourth generation model. Garrison (1985) and Kaufman (1989) outline the essential features of third-generation instructional designs. One of the characteristics of this progression is an acceptance of essentially constructivist views of design (Sweet 1991). As discussed earlier, different “degrees” of constructivism (Moshmon 1982) range from an extreme view that advocates discovery learning principles, to a more explicit form of presentation with extensive modelling and explanation. In between these positions is the dialectical view that emphasises teacher participation. Teachers are involved through such activities as scaffolding (Rogoff 1990) and a good deal of communication between instructor and students who are having difficulty, although this takes the form of hinting and prompting rather than modelling or explaining (Pressley, Harris, and Marks 1992). Accounts of actual programmes and their operation suggest that stronger support exists for dialectical constructivism than the more

extreme forms (see, for example, Resnick 1987; Poplin 1988). Two aspects of this approach are discussed below: the relevance of the curriculum to the “real” world; and the centrality of interaction among students and instructor.

Relevance in Learning

SITUATED LEARNING

The importance of relevance to university learning has been emphasised by many critics of the system. Constructivist notions that bear on the relevance requirement include learning in context, an altered interpretation of errors in learning, and an engagement of the student’s emotions as necessary to learning.

Candy and Crebert (1991) argue that transition to the workplace would be eased if the university learning environment included more process-oriented programming, rather than the content-based systems now in use. Process-oriented programmes involve more problem solving or project learning. As well as including students in cooperative group solutions to problems, the form of the problems should reflect the unpredictable and disorderly nature of the ill-defined, “messy” problems found in the workplace. The instructional problem of transfer is not easily dealt with, especially in distance education settings where such equipment as home-study science kits are not easily constructed. However, as Resnick (1987, 18) points out:

As long as school focuses mainly on individual forms of competence, on tool-free performance, and on decontextualised skills, educating people to be good learners in school settings alone may not be sufficient to help them become strong out-of-school learners.

“Situated learning”, as defined by Collins (1991) and employed by Wilson and Cole (1991, 51) in their review of cognitive models of learning, assumes that “knowledge and skills [should] be taught in contexts that reflect the way the knowledge will be useful in real life”. The extent to which the external world can be reproduced in the learning setting poses obvious problems. However, after assessing the characteristics of a number of instructional models currently in use, Wilson and Cole (1991) found a variety of attempts to create “authentic contexts” for acquiring knowledge and learning problem-solving strategies. These contexts offer at least a partial answer to questions of relevance. As Berryman (1993) points out, however, much research remains to fully develop the cognitive apprenticeship approach to instructional design.

ERRORS

In the constructivist view, errors are not to be penalised. Poplin (1988) considers them to be necessary for learning. Instructors gain insight into gaps in knowledge and the inappropriate use of strategy by students. And students can monitor their errors as measures of progress in learning. More specifically, students can reflect on their progress, explaining to themselves why they are doing better after instruction (Pressley, Harris, and Marks 1992). How students perceive their errors is critical. If they interpret mistakes as indicating inadequacy, that can only inhibit progress. Developing a congenial and encouraging atmosphere is the responsibility of the instructor; and given the link between failure rates and perceptions of programme quality or standards in many systems, this requires a considerable adjustment on the part of some instructors.

EMOTIONAL ENGAGEMENT

Feelings contribute significantly to what is learned and how well the material is acquired. The satisfaction accompanying success has been mentioned in the previous discussion of attribution theory. But emotions may be engaged by the actual ideas or procedures students are involved with in their learning. Entwistle and Entwistle (1992) point out the association between feelings and the acquisition of knowledge: “understanding itself can be seen not as a cognitive process but as an experience. It involves a feeling of satisfaction as sets of information and ideas are brought together into a coherent whole”. Belenky et al. (1986) in their volume on women and learning similarly describe the constructivist knower as becoming a passionate knower — one who enters into a union with what is to be known. This engagement becomes the predominant mode for understanding when women find points of connection between their own lives and what they are trying to understand. A final reference to the necessity of establishing a link between the emotions and meaningful learning activities is found in studies of text interpretation. It is based on “reader-response theory”, which assumes the importance of both an aesthetic and an efferent reaction to text (Rosenblatt 1938; 1978).

Social Interaction

Discussions of constructivist influences on instructional design applications and on instructional exchanges between instructor and student emphasise the active role of the instructor in learning. As Garrison (1988, 125) points out, the preoccupation with learner independence in distance education has distorted the nature of the educational transaction:

With recent developments in communications technology and the ability to communicate at a distance such a view of the independent learner is anachronistic. If we do not begin to view education as a balanced transaction and begin to work towards this goal then we risk perpetuating the existing burden of many distance learners who study without adequate guidance from and dialogue with teachers and fellow students. The quality of an educational transaction is dependent upon collaboration and meaningful dialogue and negotiation.

Of course, other opportunities arise for interaction in distance education – informal gatherings, scheduled seminars in established study centres or community libraries, and so on. Garrison's (1988) argument for interaction recognises the social nature of learning, whatever the format. Two settings in which interactive learning can occur are discussed below. Both of these, the study centre and the mediated classroom, have the potential to bring people together for group learning. In the first example, face-to-face exchanges can be set up in local study centres and, in the second, audio-conferencing and computer-mediated communications technology can bring students together for conferences independent of space and, in the case of computer-mediated conferences, independent of time. If the study centre or the audio and computer-mediated conference systems are to avoid merely duplicating traditional methods of face-to-face group instruction — recreating the campus in miniature — an alternative instructional dynamic is necessary. Increasingly, there is support for the notion of interdependence in distance education design and delivery practices (Burge 1988). This represents an alternative to the dependence-independence debate and recognises the necessity for interaction and negotiation in studying most university-level subjects. Dekkers, Kelly, and Sharma (1988, 9.4), in describing the Australian situation, state:

. . . the majority of tertiary courses require higher levels of cognition and many require ongoing interaction with academic staff, in the role

of tutor or mentor. Such interaction is necessary in order to develop in students problem solving and communication skills for both specific and general applications.

Where responsibilities for advising and tutoring are merged in response to a changed view of the student's intellectual purpose, instructional roles alter accordingly (King and Forster 1985). Some form of social interaction beyond individual mentoring then becomes a necessary feature of the instructor's role if, as has been argued, the student's task of understanding either substantive or procedural knowledge involves the social construction of knowledge. Kaye's (1992, 3) summary of the assumptions underlying collaborative learning in distance education essentially restates the constructivist position discussed earlier. These assumptions suggest that instructors participating in the group exchanges among students may be most effectively exercised through cooperative learning.

There is a large and growing literature on cooperative learning. A comparative review of the British and American literature's is provided by Topping (1992). More elaborate analyses of the American research on cooperative learning is available (see, for example, Johnson and Johnson 1989; Slavin 1990).

These reviews indicate that cooperative learning is being adopted in many educational jurisdictions, often in response to the success of collaborative arrangements in the workplace. While its effect in schools is generally viewed as positive, some research (see, for example, Webb 1982) on implementation and cognitive outcomes is qualified: person and situation variables differ in their contribution to the success of collaborative undertakings; and some of the research fails to take into account the well-entrenched expectations of many instructors and adult learners. Nevertheless, the implementation of cooperative learning principles in a range of educational, business, and service organisations demonstrates more than a belief in their benefits. Successful implementation in these settings lends empirical support to arguments for cooperative learning in distance education settings. Those aspects of cooperative learning that are especially relevant to the face-to-face and mediated settings are discussed below together with a selected overview of the literature associated with each instructional setting.

FACE-TO-FACE INSTRUCTION

A number of articles in the literature describe the structure and operation of study centres (see, for example, Harry 1985, for a review). For the most part, these articles deal with the United Kingdom Open University (Brindley and Page 1992) or the Australian system (Dekkers, Kelly, and Sharma 1988). Organisational changes are also reported for the Fernuniversitat as they extend their centres throughout the eastern regions of Germany and into Austria and central Europe (Groten 1992). Among the various analyses of study centres in distance education, the Australian Gough Report (1980) has occasioned considerable rethinking of basic philosophy and operation. One of the questions of the day asked whether study centres, because they offer face-to-face instruction, do not bring the entire distance education concept into question. Sewart's (1981) response was that study centres were designed to wean students from the traditional method of face-to-face group teaching. The study centre was seen as a transitional phase in the educational development of the off-campus student as an independent learner. As previously indicated, the goal of interdependence has since become more prominent in support service literature. However, responses to the problem of determining an appropriate role for study centres demonstrate the wide range of opinion that currently exists (Brindley and Page 1992; Castro, Livingston, and Northcott 1985; Sewart 1992b). Some direction may be gained from the extensive literature on cooperative learning in the classroom as well as the literature that describes collaboration in the workplace.

Cooperative learning in face-to-face settings occurs within a particular goal structure. Johnson and Johnson (1991) have distinguished cooperative, competitive, and individualistic goal structures. Each differs in a number of ways, including the relationships among students and instructor, the organisation of resources, and so on. Some of the more obvious features of cooperative learning are to be found in the reviews already indicated. These list some of the requirements for successful implementation of cooperative learning in schools:

- *Positive Interdependence:* The perception that students need one another to succeed.
- *Encouragement:* Students promote each others' learning by helping, sharing, and encouraging efforts to learn.
- *Individual Accountability:* Each student's performance is frequently assessed and the results "awarded" to the individual and the group.
- *Interpersonal Skills:* Small group functioning requires the collaborative skills of leadership, decision-making, trust building, communication, and conflict management.
- *Group Processing:* The group discusses how well they are achieving their goals and maintaining effective working relationships among members.

The concept most central to cooperative learning and its successful implementation is positive interdependence. Johnson and Johnson (1991) describe this notion as comprising mutual goals, joint rewards, shared material and information, and assigned roles. A similar summary, applicable to a variety of organisations, has been assembled by Schrage (1990) and is summarised by Kaye (1992, 5) who notes its relevance to collaborative distance learning activities:

The factors identified by Schrage which determine the likely success of any form of collaboration are undoubtedly relevant to collaborative learning activities. They include: competence among group members, a shared and understood goal, mutual respect and trust, the creation and manipulation of shared spaces, multiple forms of representation, continuous - but not continual — communication, formal and informal environments, clear lines of responsibility, but no restrictive boundaries, the acceptance that decisions do not have to be based on consensus, and that physical presence is not necessary, the selective use of outsiders, and the realisation that the collaboration ends when its goal has been achieved.

Schrage's collaborative statement is directed to the effective operation of any organisation and reflects perhaps the perspective of adults more than most of the school-based literature on cooperative learning. As well, it introduces the idea of mediated instruction in accepting that individuals need not be in one another's presence to communicate effectively.

MEDIATED INSTRUCTION

With the advent of multimedia systems, describing the domain of interactive delivery technology in distance education becomes a complex task (see, for example, Hannafin 1989). However, a sketch of communication formats currently in use will serve to demonstrate the potential of telecommunications to create a richer learning environment. Currently two reasonably well-tested means of providing mediated interactive instruction are used: audio-conferencing and computer-mediated communication (CMC). These forms of mediated communication and learning share many features, but the educational implications of their differences are considerable, especially for cooperative learning and the role of tuition and support (Carrier and Schofield 1991).

AUDIO-CONFERENCING Recent reviews of the literature on audio-conferencing in education deal with two communication formats. The first is audio-teleconferencing in which students engage in real-time communication through a bridge system. Although widely used, at least in Canada (Stahmer and Helm 1987; Helm 1989), there is a limited quantity of research on this medium. Rothe (1985) developed a conceptual scheme for integrating the various interactions among actors in a distance education network. Burge and Howard (1990) and Garrison (1990) conducted evaluations of courses delivered by an audio-conferencing system. More recently, technology has advanced to the point where a graphics dimension can be reliably added to the audio transmission. As Anderson (1992) points out, available evaluations of the educational efficacy of devices such as the TeleWriter are neither numerous nor detailed. Yet they exist and the findings are generally positive (see, for example, Gilcher and Johnstone 1989; Maher 1986). In his analysis of the use of audiographics in a complex environment (a variety of instructors, courses, and a large number of students), Anderson (1992, 18) found that the addition of a graphics component was well received by students and instructors; and, in summarising their reaction, Anderson considered that the technology definitely enhanced the potential for interactive learning.

COMPUTER-MEDIATED COMMUNICATION Both audio and computer-mediated conferencing systems allow many-to-many exchanges and both overcome problems of distance. Computer-mediated communication, however, is unique in that it is asynchronous and therefore can accommodate different time schedules among participants. It is also a text-based system with the constraints and opportunities this implies for information access, exchanges, and learner involvement. After comparing different educational vehicles, Harasim (1990) considered the computer conferencing aspect of computer-mediated communication to be a qualitatively different learning environment, one which required different assumptions if effective instruction were to be conducted online.

The structure of a computer-mediated communication system may be described in considerable detail (see, for example, Hiltz 1986). However, three basic online services are available: online databases and information banks, electronic mail (E-mail), and computer conferencing. Databases offer an economic means of access for widely dispersed students. In fact, international access has become feasible, and the range and accessibility of information banks grows daily. Electronic mail allows asynchronous, text-based communication between correspondents. Messages are routed to the addressee's mailbox on the host computer and reside there until read. Such messages may be responded to, rerouted, or copied. Most E-mail systems operate a bulletin board with read-only access to a variety of messages or documents. Although somewhat limited in flexibility, E-mail is a rapidly expanding system both in education and business. The third service, computer conferencing, is very similar to E-mail but is more complex. Computer conferencing employs the filing and organising power of the host computer to establish a range of facilities that enhance group communication and

information retrieval: directories of users and conferences, conference management tools, search facilities, polling options, cooperative writing, and other means of customising the system to suit special group needs.

Computer-mediated communication systems offer a range of specifically educational functions. These include: the “virtual seminar”, the online classroom, online games and simulations, and computer-supported writing and language learning forums. They can also be used as adjuncts to existing campus-based or distance education courses. And, finally, they can be networked as information resources offering access to library services and online databases.

A number of reviews of the literature on computer-mediated communication have recently been published. Burge (1992) and Wells (1992) have both produced comprehensive bibliographies of computer-mediated communication in education. More in-depth analyses and accounts of research and development programmes may be found in Harasim (1990), Mason and Kaye (1989), and Kaye (1992). Among these analyses, computer conferencing is the focus of greatest educational interest. Many of the conferencing issues identified in the reviews relate directly to cooperative learning.

Assessments of the educational potential of computer-mediated communication have emphasised different aspects of the system. Most attend to the technological features, especially the difficulties in adoption and use (see, for example, Hiltz 1986). Others are concerned with developing tools that improve our understanding of cognitive development in the virtual classroom (Henri 1992). But many consider the social design of computer-mediated communication to be the central issue. Riel and Levin (1990, 168) state: “the social design of networks will become the dominant issue: what should be the nature of the interactions, how should leadership be provided, and how should activity be organised in this new communication medium?”. Kaye (1992) similarly argues that conferencing is primarily a social event and as such draws on the interpersonal skills of its participants to build successful exchanges. This applies especially to the conference moderator, an argument made in many articles on the collaborative and educational uses of computer-mediated communication. Feenberg (1989) lists three necessary areas of moderator expertise: contextualising functions, which include opening a discussion and setting norms and agendas; monitoring functions, which involve the recognition of participants’ contributions and the appropriate timing for prompts; and, finally, the “meta” functions, which provide summary commentary and outlines of the various pathways followed in the debate and discussion. These skills are very similar to those required by the seminar leader in any instructional setting, and Kaye (1992, 16) makes the point that those who display such competencies in the traditional seminar are likely to transfer them successfully to the somewhat different electronic environment. In summarising his analysis of the recent literature, Kaye (1992, 22) suggests:

... just as in the face-to-face classroom or organisational context, the successful inclusion of collaborative learning activities within the CMC environment depends also on the value attached to interpersonal collaboration, on the way such collaboration is planned and organised, and on the extent to which it meets the needs, interests, and goals of the participants.

SUMMARY

This literature review has attempted to indicate the general direction of change in distance education institutions and the implications for student support systems. A consideration of institutional policies in terms of dissemination and development approaches has suggested a fundamental alteration to the traditional separation of tutoring and advising -- where advising involved individual counselling of students with problems. Using the perspective of a developmental approach to distance education that Boot and Hodgson (1987) suggest, some specific concepts relevant to student support services have been discussed. That analysis has suggested the following major points, which provide a perspective on the case studies to follow and on the conclusions and recommendations of the participants in the Delhi Symposium, who presented and discussed those cases:

- Distance education institutions are moving away from the traditional industrial model of design, development, and delivery of learning packages towards a model more concerned with the way students both interact with the subject and come to understand the ideas studied.
- This approach is based on an altered concept of the learner, who is seen to engage the ideas in a field of study and make sense of this knowledge in a personally meaningful way.
- Instructional design increasingly includes interaction as a defining characteristic of distance learning and not as a supplemental attribute of the system.
- The roles of advisor and tutor need to merge. The primary responsibility of the resulting "academic counsellor" is to pursue a learner-centred approach to instruction.
- Cooperative goal structures can facilitate the development of effective learning strategies. Collaboration is possible in both mediated and face-to-face settings but its successful conduct requires that significant changes be made to current instructional design and implementation practices. The roles and responsibilities of both student and academic counsellor must reflect these changes.

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