Strategies for accommodating individuals’ styles and preferences in flexible learning programmes

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Abstract
There has been a considerable growth in the use of flexible methods of delivery for workplace learning and development. However, in designing programmes of flexible learning there is often the assumption that learners will exhibit uniformity in the ways in which they process and organise information (cognitive style), in their predispositions towards particular learning formats and media (instructional preferences) and the conscious actions they employ to deal with the demands of specific learning situations (learning strategies). In adopting such a stance one runs the risk of ignoring important aspects of individual differences in styles, preferences and strategies. Our purpose in this paper will be to: (i) consider some aspects of individual difference that are pertinent to the delivery of flexible learning in the workplace; (ii) identify some of the challenges that extant differences in styles and preferences between individuals may raise for instructional designers and learning facilitators; (iii) suggest ways in which models of flexible learning design and delivery may acknowledge and accommodate individual differences in styles and preferences through the use of an appropriate range of instructional design, learning and support strategies.

Keywords: cognitive styles; flexible learning; learning preferences; learning strategies; learning styles

Introduction
Developments in the technologies available for the design and delivery of workplace learning programmes, together with the increasingly diverse learning needs of organizations, have encouraged a stronger focus on learning design and delivery that is more closely aligned to learner requirements and contexts. However, conventional approaches to the design of programmes for workforce learning and development some-
times have been typically based upon instructional design strategies in which the implicit assumption is that the target group of learners will exhibit uniformity in the ways in which they process and organise information and in their predispositions towards specific learning situations and media. However, in adopting such a stance one runs the risk of ignoring important aspects of individual differences in cognitive style (i.e., the ways in which individuals organise and process information in memory) and instructional preferences (i.e., their disposition towards particular aspects of the learning environment). Similarly, the ways in which individuals may adapt to the demands of specific learning situations through the use of learning strategies may also be overlooked in the design and implementation of learning.

The three issues of style, preference and strategy are brought sharply into focus by the use of flexible modes of delivering learning and the building of a theoretical framework for distance education (Jung, 2001). It is generally acknowledged that there has been a considerable growth in the use of flexible forms of delivery for workplace learning and development (Calder & McCollum, 1998). The growth in flexible delivery has been fuelled by rapid and ongoing developments in computing and information technology, such that ‘e-learning’ is now widely recognised as a valuable and legitimate vehicle for the delivery of flexible learning. An axiom of a flexible learning philosophy is that modes of delivery such as distance learning, programmed instruction, technology based training, telematics and e-learning enable learners to acquire job-related knowledge and skills at a time, place and pace that is commensurate with their own particular circumstances. A number of researchers have addressed the issue of flexibility in design in relation to learners’ needs. For example Nikolova and Collis (1998) discussed the problems of designing flexible instruction from the designers’ and the learners’ perspective and argued that telematics plays an important role in providing flexibility. Learning style is important in this regard; Ross and Schulz (1999: 5) in a study of the effect of styles on learning outcomes reported a significant effect of style upon learning outcome, and that certain types of learner are at risk from doing ‘poorly with certain forms of computer based instruction’. Researchers are increasingly turning their attention to instructional features of learning environments as a source of understanding the relationship between the learner, the environment and learning outcomes (Morgan, Morgan & Hall, 2000). The interaction of learners’ styles and the instructional design features adds significantly to these debates; for example, Ford and Chen (2001) provided evidence that matching and mismatching can have significant effects upon learning outcomes.

In our view it is perhaps ironic that the laudable aspirations that flexible learning has in providing learner-centeredness through time, place and pace of delivery may, to a degree, be undermined if due consideration is not given to individual differences in styles, preferences and strategies. Moreover, advances in knowledge regarding individual differences in learning and cognition and the developments in instructional design and technology appear to have proceeded largely in isolation from each other. Our purposes in this paper will be to: (i) consider some aspects of individual difference that are pertinent to the delivery of flexible learning in the workplace; (ii) identify some of
the challenges that differences in styles and preferences between individuals may raise for instructional designers and facilitators; (iii) suggest ways in which models of flexible learning design and delivery may acknowledge and accommodate individual differences in styles and preferences through the use of an appropriate range of instructional design, learning and support strategies. In this regard we concur with Hughes and Hey (2001) in that the different perspectives of each of the stakeholders in the development of learning materials needs to be integral to the instructional design process.

A conceptual framework for style, preference and strategy

There are many constructs that have in the past been labelled as ‘learning styles’; for example Curry (1983) identified 21 different models of style and later commented that:

Like the blind men in the fable about the elephant, learning styles researchers tend to investigate only a part of the whole and thus have yet to provide a definitive picture of the matter before them. (Curry, 1990: 50)

The proliferation of labels, allied to indiscriminate use of the term ‘learning style’ has resulted in haphazard expansion, over-extension, semantic confusion and divergence in a field that has no unifying taxonomy (Moran, 1991). In response to this a number of researchers have attempted to provide conceptual frameworks into which the various constructs may be usefully categorized (for example: Curry, 1983; Riding & Rayner, 1998; Sternberg & Grigorenko, 2001).

Recognising the varieties of types and labels that have been postulated, Curry (1983) organised the various learning style constructs as layered phenomena, likening them to the concentric layers of an onion. Indeed, her model is often referred to as the ‘onion model’, but may be more properly described as taxonomy rather than a model since it does not elaborate to any great extent upon processes and relationships. More recently Riding and Rayner have argued that there is a need to integrate more fully the various models of style (Riding & Rayner, 1998; Rayner & Riding, 1997). Using the frameworks suggested by Sternberg and Grigorenko (1997) and by Riding and Cheema (1991), they described a number of models within an overall framework that comprised: (i) cognition-centred approaches, for example: perceptual functioning (Witkin, 1962; Witkin et al., 1977), impulsivity-reflectivity (Kagan et al., 1965), convergent-divergent thinking (Guilford, 1967), holist and serialist thinking (Pask & Scott, 1972), concrete-abstract/random-sequential thinking (Gregorc, 1982), the assimilator-explorer styles (Kaufmann, 1989), adaption versus innovation (Kirton, 1976), intuition-analysis (Allinson & Hayes, 1996), Paivio’s dual coding theory (Paivio, 1971), Richardson’s verbaliser-visualiser model (1977); (ii) learning-centred approaches, for example Kolb (1976; 1984), Honey and Mumford (1986), Entwistle (1988), Biggs (1979; 1985) and Schmeck et al (1977), Dunn et al (1989) and Riechmann and Grasha (1974). Curry, Riding, Rayner and other researchers who have attempted to categorise style and preference constructs (eg, Hayes & Allinson, 1996; Sternberg & Grigorenko, 2001) have emphasised the relative stability of style versus the adaptive nature of strategy. These researchers have also postulated the role of cognition as an underlying process and have separated out...
phenomena that reflect individuals’ habitual information processing modes (cognitive style), behaviours (learning style) and predispositions (learning preferences) from those that are responses to a given context (learning strategy).

In this paper we make a clear distinction between ‘learning strategies’ that are invoked by learners as they relate to and interact with learning tasks, and instructional or teaching strategies that are used by instructional designers in their design of learning materials and pedagogical approaches, and by teachers and instructors as they facilitate learning for individuals or groups. A relationship between learning strategies and the context for learning has been suggested by Sadler-Smith (1996) and Smith (2000c). As a result, instructional designers and teachers can design and provide the context for learning in such a way as to strongly influence the learning strategies employed by individual learners. The question that we will consider is: ‘to what extent may developments in style theory be linked to parallel developments in instructional systems design and delivery and what is their likely impact upon the outcomes of flexible learning?’

Flexible learning
For the purposes of this paper we interpret the term ‘flexible learning’ to indicate a means of delivering learning for the acquisition of work-related knowledge and skills which include the use of instructional technologies. Flexible learning requires learners to exhibit a degree of autonomy and self-direction in order to engage effectively in a learning process in which the learner and other actors (for example, instructional designers and learning facilitators) may not be physically and/or temporally contiguous. Our definition thus encompasses distance and open learning approaches, both of which may be characterised by a separation temporally and/or spatially between the learner and facilitator, as well as delivery via a range of technologies from print-based ‘packages’ through to multimedia programs delivered on-line. Other related terms include ‘open learning’, ‘distance learning’, ‘distance education’, ‘self-instruction’, ‘auto-didacticism’ and ‘independent study’. As did the advent of programmed learning and the so-called ‘teaching machines’ in the 1950s and 1960s, the development of digital storage and transmission of data and the recent coming together of computing and information technologies (manifested in the internet and e-learning) has given added impetus to the debates relating to the application and efficacy of flexible learning (see, for example, Greco, 1999; Sadler-Smith, Down & Lean, 2000; Vicere, 2001).

Implicit in the definitions offered above is the notion that most forms of flexible learning rely upon some form of technology (ranging from print-based to computer-based) to reduce or even obviate the need for an instructor to be present, to facilitate synchronous or asynchronous communication between learner and instructor or to provide information in a wide variety of formats (sometimes on-demand). Bates (1997) identified a number of pedagogical, managerial and financial reasons for using technology in learning, namely: (i) improving the quality of learning; (ii) improving access to education and training; (iii) reducing the costs of education; (iv) improving the cost-effectiveness of education. In this context we contend that acknowledging and accommodating individual differences in styles and preferences is important in improving the quality of
the learning experience and offers the potential to further increase the efficiency and effectiveness of flexible work-related learning and development. Moreover, there are a number of features of flexible learning that are germane to arguments relating to the acknowledgement and accommodation of individual differences in styles and preferences.

**Self-direction**

One of the fundamental precepts of much flexible learning is the capability of the learner to exhibit or develop ‘self-directedness’. The concept of self-directed learning applies to a wide variety of learning experiences from those associated with self-instruction (via programmed learning) through to autonomy or independence in learning in virtually any context (Gerber, Lankshear, Larsson & Larsson, 1995: 26). The requirement which is implicit in much flexible learning design, namely that all learners need to exhibit a degree of self-direction, suggests that particular instructional, learning and support strategies need to be adopted to facilitate the achievement of self-direction.

**Collaboration**

Related to the notion of self-direction are the issues of individual(ised) instruction and learner autonomy. For some individuals collaboration and interpersonal contact is an important element of the learning process; whilst for others the opportunity to interact with other learners is less important (see, Sadler-Smith, 1999; Sadler-Smith & Riding, 1999).

**Mode of information presentation**

The ability of technologies to present high quality graphical or pictorial images allied to the use of textual devices ranging from typographical features on the printed page to hypertext and ‘hotlinks’, present considerable potential for the tailoring of instructional design strategies to individuals’ styles and preferences. The potential offered by audio-visual and computer-based methods in this regard is one of the principal advantages of such methods over and above conventional approaches and lower level technologies.

**Structure of learning programmes**

Flexible delivery of learning allows the opportunity for learners to follow a variety of routes through a given learning programme such that they are less likely to be constrained by the routes chosen by a tutor or fellow learner in a classroom situation. For example, some individuals may habitually proceed step-by-step through a learning package, whilst others may prefer to proceed in a less linear fashion; some may habitually engage with materials at a level of detailed analysis whilst others may take a broader more integrative perspective.

**Some aspects of individual differences in styles and preferences and their relevance for flexible delivery**

In this section we will consider some theoretical and empirical evidence that points to the potential or observed impact of individual differences in style and preference upon flexible learning. This analysis will be used subsequently as the basis for a framework
that suggests ways of acknowledging and accommodating individual differences in these constructs through the use of appropriate instructional design, learning and support strategies (see Figure 1).

In the model depicted in Figure 1 the mode of delivery and individual differences interact to affect the learning process (in terms of cognitive functioning, learning behaviours and predispositions towards specific learning activities) and its outcome (in terms of performance, motivation and engagement). Prior knowledge is included as one moderating variable upon process and hence outcome. The three strategies are included as potential interventions at different stages of the flexible delivery process, namely the design stage (instructional design strategy) and the implementation stage (learning strategy and support strategy). Knowledge of results is hypothesised as operating as feedback with strategies being modified contingent upon the efficacy or otherwise of the learning process and its outcomes.

**Cognition-centred approaches: Individual differences in cognitive style**
The verbal-imagery (VI) dimension of cognitive style has been described as an individual’s habitual mode of representation of information in memory during thinking...
(Riding, 1997). Verbalisers ‘consider the information they read, see or listen to, in words or verbal associations’; imagers on the other hand, when they read, listen to or consider information, experience ‘fluent spontaneous and frequent pictorial mental pictures’ (Riding, 1994: 48). Riding (1991) has provided a direct (ie, non-self report) computer administered assessment of the VI dimension of cognitive style (the Cognitive Styles Analysis, CSA). In an extensive programme of research Riding and his co-workers have provided evidence that suggests that the interaction of VI cognitive style and mode of presentation affect learning. For example, the computer presentation of information in a text-plus-picture format facilitated learning by imagers compared with the same information in a text-plus-text format (Riding & Douglas, 1993). In the same study in the text plus picture condition 50 per cent of imagers used illustrations as part of their answers compared with 12 per cent of verbalisers. Imagers appear to recall highly visually descriptive text better than acoustically complex and unfamiliar text; whilst the reverse is true for verbalisers (Riding & Calvey, 1981; Riding & Dyer, 1980). Riding and Watts (1997) presented participants with a choice of three alternative instructional formats (unstructured verbal, structured verbal and structured pictorial) and observed that most verbalisers selected the verbal version whilst most imagers selected the pictorial version. Taken overall, Riding (2001: 61) has concluded, ‘imagers generally learn best from pictorial presentations whereas verbalisers learn best from verbal presentations’. It should be noted that Riding has presented evidence based upon EEG for the physiological basis of the VI dimension of style (Riding, Glass, Butler & Pleydell-Pearce, 1997; Glass and Riding, 2000).

In an unrelated programme of research using the Styles of Processing scale (SOP), Smith and Woody (2000) compared multimedia and traditional teaching approaches. Their results suggested that those students who prefer visual presentation of information over verbal presentation of information will benefit more from multimedia instruction than those who are less visually oriented (Smith & Woody, 2000: 223). We will consider some potential ways of designing flexible work-based learning that accommodates individual differences in verbal and imagery modes of processing through the use of appropriate instructional design strategies later.

The wholist-analytical dimension of cognitive style has been described as the habitual way in which an individual processes information: some individuals will process information into its component parts (described as analytics); others will retain a global or overall view of information (described as wholists) (Riding, 1997: 30). For wholists there is the danger that the distinction between the parts of a topic may become blurred. For analytics, the separation of the whole into its parts may mean that one aspect of the whole may be focused on at the expense of the others and hence its overall importance exaggerated.

Riding’s CSA may also be used to assess an individual’s position on the wholist-analytical (WA) dimension of cognitive style. As with the VI dimension, research by Riding and Pearson (1994) indicated that style is not related to ability. In research carried out with participants who were high school students and trainees in industry,
Riding and his co-workers have provided evidence that suggests that the WA dimension of cognitive style interacts with the structure of teaching material to affect learning performance. Riding and Sadler-Smith (1992) conducted an experimental study to investigate the interaction between the two dimensions of cognitive style (VI × WA) and structure of material (three instructional designs which varied in terms of the use of structural devices such as overviews and also presentation mode) using a computer-based learning package. Recall performance appeared to be related to the interaction of style, presentation mode and structure. Riding and Al-Sanabani (1998) observed an interaction between WA style and gender in their effect upon performance for learning from materials that varied in terms of the use of headings and sub-divisions of textual content. Sadler-Smith and Riding (1999) explored the learning preferences of business and management undergraduates and observed that analytics preferred to have control themselves whereas the wholists had no preference. As with the VI dimension, Riding has presented evidence based upon EEG for the physiological basis of WA (Riding, Glass, Butler & Pleydell-Pearce, 1997; Glass & Riding, 2000).

Whole versus part learning was also studied by Pask and Scott (1972) who drew a distinction between a holist style (characterised by global, ‘top down’ and simultaneous processing) and a serialist style (characterised by local, ‘bottom-up’ and sequential processing). Versatile learners were those who were able to employ both holist and serial processing. Pask used this theory and its associated assessment to identify two varieties of what he termed learning ‘pathologies’: (i) an improvidence pathology: the inability of serialist learners to easily attain a global view; (ii) a globetrotting pathology: the tendency of holistic learners to make hasty decisions on insufficient evidence. We will consider some ways in which flexible work-based learning may accommodate individual differences in analytic/serialist and wholist modes of processing later.

Learning centred approaches: Individual differences in learning style

Kolb (1984) described learning in terms of a four-stage process consisting of concrete experience (CE), reflective observation (RO), abstract conceptualisation (AC) and active experimentation (AE). Kolb suggested that pairs of these activities might represent the poles of two orthogonal learning style dimensions (CE–AC and RO–AE). Kolb argued that individuals have particular strengths that may form the basis of their preferred learning style. Kolb’s Learning Styles Inventory (LSI) is a self-report questionnaire inventory that enables an individual to identify their preferred learning style from one of four types (assimilator, accommodator, diverger and converger). Honey and Mumford (1986) built upon the work of Kolb and developed their own model of the learning process (the learning cycle) and learning styles (activist, reflector, theorist and pragmatist). Honey and Mumford also developed their own assessment instrument that they called the Learning Styles Questionnaire (LSQ). There have been many studies that have examined the reliability and validity of the LSI and LSQ and some recent work has presented evidence in favour of Kolb’s two orthogonal style dimensions (Sadler-Smith, 2001a) and four unipolar factors underlying Honey and Mumford’s LSQ (Sadler-Smith, 2001b) (which raises interesting questions about the degree of fit between the Kolb and the Honey and Mumford models).
A wholly effective learner has the capability to operate effectively at each stage of the cycle. The tools that accompany the Honey and Mumford version of the learning styles model are well tried and tested as management development techniques which aim to accommodate each stage of the learning cycle by enabling managers to: (i) identify their own style; (ii) identify their strengths and weaknesses; (iii) undertake a range of activities that may overcome weaknesses and capitalise upon strengths. Hence, for flexible learning to be truly learner-centred there are, perhaps, arguments for building in to the design of instructional materials each of the four stages of the cycle in order that there will be activities congruent with each individual’s styles, but equally importantly, activities which do not match the individual’s style but which can be used as the basis for self-development. In a later section of this paper we will consider some ways in which flexible work-based learning may be designed to include each of the stages of an experiential learning cycle.

Individual differences in preferences

A number of researchers have suggested that individuals may also differ with respect to their learning preferences (Sadler-Smith, 1996; Sadler-Smith, Allinson & Hayes, 2000). Preference can manifest itself in a number of ways, for example, dependent learning versus independent learning, collaborative versus non-collaborative and preferences for particular instructional media (Sadler-Smith & Riding, 1999). It has been argued that to ignore learners’ preferences may perhaps lead to sub-optimal levels of motivation, engagement in the learning process and, ultimately, learning performance (Sadler-Smith, Allinson & Hayes, 2000).

Several researchers have focused specifically on the impact of preferences upon work-based learning (Allinson & Hayes, 1996; Riding & Sadler-Smith, 1992; Smith, 2000a, 2000b). For example, Smith (2000a, 2000b) carried out research on the styles and learning preferences of over one thousand vocational education and training (VET) learners in Australia. The typology that suggested itself from that research combined presentation mode preference (verbal–visual) and autonomy preference (dependent–independent). The results indicated that that the majority of VET learners lie in the visual/dependent preference quadrant, whereas resource-based flexible delivery assumes VET learners lie in the verbal/independent preference quadrant (ie, the two quadrants that are diametrically opposed).

A number of variables have been shown to influence preferences, including age (Smith, 2000c), gender (Heikkinen, Pettigrew & Zakrajsek, 1985; Brainard & Ommen, 1977), domain and experiences of learning (Canfield, 1980; Brillhart, 1981). Furthermore, Sadler-Smith (1999) and Sadler-Smith and Riding (1999) presented data that suggested that learning preferences and cognitive style are interrelated. In a meta-analysis of 54 publications Tamir (1985) has shown that, among high school and college students, learning preferences are related to cultural background, grade levels, discipline being studied, curriculum approach, career goals and achievements. Curry (1983) proposed the view that preferences are amenable to change through the management of the learning environment. Moreover, the study of preferences of individual learners,
or groups of learners, can provide not only information useful to designing instruction that is more engaging, but also enables some insight to preferences that may need to be changed or developed to suit particular learning tasks or contexts.

Learners in a work context in general may not have preferences that readily pre-dispose them towards the autonomy demanded by flexible learning. For example, through interview-based research with apprentices and trainers Brooker and Butler (1997) suggested that apprentices rated highly learning methods that involved structured approaches with assistance from other experts in the workplace and that learning or practising alone were not favoured approaches. Smith's (2000a) research with apprentices provided further empirical evidence for the structured-assisted-socially mediated preference in training delivery, together with a low preference for self-directed learning. Further analysis of data from over 1,000 vocational learners revealed that those learners are characterised by a preference for dependent rather than self-directed learning (Smith, 2000b). Billett (1996) used observational approaches in the workplace to explore the use of resource based learning materials and engagement in everyday practice. He found that everyday practice was consistently viewed as more effective than instructional materials. In the UK Sadler-Smith, Down and Lean (2000) compared managers' perceptions of the effectiveness of a range of learning methods. Work-based methods such as on-job learning were perceived as being more effective (and were implemented more frequently) than other methods such as taught courses, whilst the method perceived as least effective (and used least frequently) was distance learning. Similarly, Sadler-Smith, Allinson and Hayes (1999) investigated the learning preferences of personnel practitioners in the UK and found that work-based and traditional learning methods were preferred over self-directed methods. This preference is not confined to individuals in the workplace, for example Sadler-Smith and Riding (1999) found that business and management students preferred dependent and collaborative learning methods to autonomous methods. We will consider some ways in which individuals' preferences may be accommodated when designing, and delivering flexible work-based learning in a later section of this paper.

The role of strategies in enhancing flexible delivery
One conclusion that we draw from the above analysis is that there are important challenges to be addressed by flexible delivery if the potential benefits it offers to individuals and organizations are to be maximized. As previously noted and shown in Figure 1, we contend that three separate categories of strategy development are necessary in order to accommodate and acknowledge individual differences in styles and preferences in the design and implementation of flexible learning in the workplace. Using a framework of two sets of strategies, 'learner preparation' and 'workplace preparation' (that included instructional strategies) Smith (2001) has developed a set of specific strategies that may be used in the workplace to enhance readiness for flexible learning. Those strategies include suggestions for the development of learner preparation for flexible learning through the development of self-directed learning processes and the selection of delivery methods; for the development of workplace preparedness to support flexible learning with attention being focused on training policy, training
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structures, and the skills and understandings of workplace training personnel. Subsequent research (Smith, Robertson & Wakefield, 2002) has tested the feasibility of those strategies in a range of enterprises. Their findings inform and support the model that we present here in that the enterprises used in the research considered as feasible the adoption of strategies to increase preparedness of both learners and workplaces, through individual training plans and contracts, and the supervision of those plans and contracts through the structures and policies of the enterprise, and the supervisory behaviour of training staff and other expert mentors. Central to successful outcomes for flexible learning was an acceptance by enterprises of the need to develop the learning to learn skills, and the task-related skills, of workplace learners through a range of instructional design strategies, learner-centred strategies, and workplace support strategies. Also central to successful outcomes was an acceptance by enterprises that there are significant differences between individuals in how learning is approached and engaged in, and considerable differences in the workplace contexts within which the learning processes occur. Table 1 identifies the various actors and the associated strategies mapped against styles and preferences. The foci for this model are the actors—the instructional designers, the learners and the supporters or facilitators (who in the workplace context might include instructors, trainers, tutors, coaches, mentors or managers) whose role is mapped against the relevant construct.

Instructional designers’ (teaching) strategies
A variety of strategies enacted by instructional designers might acknowledge and accommodate individual differences in styles and preferences in the following ways.

Cognitive style: A distinction may be drawn between a number of accommodative approaches to the design of instructional materials. For example, Sadler-Smith (1996: 188) defined adaptive approaches as those that aim to match the attributes of the instructional materials to the styles or preferences of the learner. Hence under this model individual differences remain intact and are accommodated through, for example, differing modes and structures of presentation tailored to the styles of groups of learners (the instructional design may exhibit a degree of specificity or even ‘intelligence’). Non-adaptive approaches were defined as those that employ a variety of modes and structures of presentation within the same instructional design in order that a range of individual differences may be accommodated (in this case the instructional design exhibits a degree of ‘balance’). An important difference between the adaptive and the non-adaptive approach is that the latter is reliant to some degree upon the learner being aware of her/his own styles and preferences and hence able to select or sense the most appropriate mode or structure accordingly. Drawing also on the Smith (2001) and Smith, Robertson and Wakefield (2002) research, Table 1 describes some potential ways in which the strategies employed by instructional designers may be adapted to acknowledge and accommodate individual differences in styles and preferences.

Learning styles: Experiential learning theory and andragogical learning theory share the fundamental precept that adult learning is grounded in experiences of the real
world. It is important therefore with flexible learning, which tends to rely upon a technology as mediator or proxy for real world experiences, to maximise the connection between the content and the external world. In this way the concrete experience stage of the experiential cycle may be accommodated (and also those individuals who have a preference for that particular style). Possible mediators of experience might include the use of video, audio and artefacts. The instructional design strategy may accommodate the reflective observation stage through allowing time and space for reflection; this may have implications for the sequencing and pacing of instruction. Individuals vary in their needs to make sense of their experiences through conceptual frames—often such frames may pre-exist (in the form of theories about bodies of knowledge). Access to further knowledge to test experiences against extant conceptual frames could be provided through allowing access to additional information (for example, contained on CD or via the internet). To complete the learning cycle individuals need to be given the opportunity to try out newly learned ideas through practical application. Instructional design for flexible delivery could accommodate this stage by suggesting ways in which learners could apply new learning and reflect upon its efficacy, and perhaps building the requirement to apply learning into assessments.

*Instructional preferences* Accommodating instructional preferences could be achieved at the design stage by providing a range of instructional materials and methods, for example print-based materials, computer-based, video and audio materials as well as individualised and collaborative learning methods. Only through broader exposure can individuals be made aware of the range of possible instructional materials and methods, sense those that they feel more comfortable with, and also to adapt to alternative or unfamiliar approaches. In developing his set of strategies for successful flexible learning in enterprises, Smith (2001) made the point that any strategic approach needs to provide learners with the opportunity to develop comfort with a wider range of training materials and delivery methods in order to broaden their engagement with differently packaged training programmes.

*Learners’ strategies* In addition to the adaptive and non-adaptive approaches outlined above, Riding and Sadler-Smith (1997: 203) identified an approach that encourages trainees to develop strategies to make learning easier by using the strengths of their styles or overcoming their weaknesses. This contrasting approach to accommodating individual differences calls for the reduction of individual differences (through strategy development) rather than for their differential accommodation. It is an approach that calls for learners to be trained to be self-reliant (see Gropper, 1983: 124). Researchers have argued that a learners’ understanding of their own styles and preferences is important in enhancing learner’s success in independent learning programmes (Boote, 1998). Smith (2000a, 2000b) drew attention to the need to develop strategies to assist vocational learners achieve an independent, self-directed approach in a flexible learning context. Riding and Sadler-Smith (1999) proposed that learners may adopt a strategic approach by: (i) *sensing* the learning formats and contexts to which they are exposed and gauging the extent to which they feel comfortable with them; (ii) *selecting*, where possible, the learn-
ing format or context that they feel will be the most effective for them; (iii) *accommodating* by translation formats or contexts that may not suit their style. Table 1 describes some potential ways in which the strategies employed by learners may help to acknowledge and accommodate individual differences in styles and preferences and these include the following.

**Cognitive style:** a translation learning strategy might be employed in order that material presented in one format might be converted to another format that better matches an individual’s habitual information processing style. A mapping strategy (using advance organisers) might be one method of explicating interrelationships between concepts in different formats, for example interconnected (web-type) structures to enable analytics to see the whole, and hierarchical (tree-type) structures to enable wholists to see the sequencing of concepts. This aspect of strategy might be more appropriately labelled a cognitive strategy. Hofman and van Oostendorp (1999) explored the effects of navigation and disorientation as sources of inefficiency in web-based learning—they concluded that the use of structural overview interacted with ability and that, for less knowledgeable readers, the overview may hinder understanding by inhibiting attention to micro-features of the text. They did not explore the effect of style in this regard, but previous research suggests that style and ability may interact to affect learning performance through a cognitive overload mechanism (see Riding & Rayner, 1998).

**Learning style and instructional preferences:** a key element of accommodating learning style through learning strategies lies in the individual becoming aware of her or his preferred style. This depends upon the opportunity being made available for an individual to learn about their own style, but also the predisposition of the learner to be motivated to become self-aware and to behave in flexible and different ways when circumstances demand it. This may involve an individual moving outside her or his more comfortable psychological state into a new and less familiar terrain, and experimenting with new and unfamiliar instructional methods. This may involve an individual moving outside her or his more comfortable set of preferences to engage with and accommodate new and unfamiliar instructional methods. The facilitation of this process is probably most appropriately handled by a skilled and knowledgeable facilitator (see supporters' strategies below).

**Facilitators’ and supporters’ strategies**

As argued previously in this paper, one of the principal limitations of a self-directed learning environment is the comparative absence of instructor/facilitator guidance and immediacy of personalised feedback, and hence the need for a supporter of learning role. In research in Australia, Warner, Christie and Choy (1998) showed a lack of readiness amongst vocational learners for the self-directed learning required by flexible delivery, and the need to take into account the differences and the similarities between individuals that their research indicated. These findings, along with those of Smith (2000a, 2000b) and Sadler-Smith, Down and Lean (2000) suggest that workplaces have not typically developed effective learner support systems for flexible delivery which
acknowledge or accommodate individual differences in styles and preferences. Effective systems for the support of instructional designs that acknowledge and accommodate individuals’ differences in styles and preferences are likely to require the facility to provide ‘learning-to-learn’ inputs that: (i) identify learners’ styles and give appropriate feedback; (ii) provide learning opportunities that make clear the distinction between styles, strategies and preferences and how these are interrelated, what the implications are for learning; (iii) use of learning contracts and the integration of styles awareness into such contracts. It is also likely that facilitators and supporters themselves may need guidance and training in how to identify, feedback and adapt learning to individual’s styles (Smith, 2001). Hence there may be a ‘training the trainers’ need for facilitators and supporters in the area of ‘learning to learn’.

Table 1 describes some potential ways in which the support strategies employed by tutors and those responsible for the management of flexible learning delivery may help to acknowledge and accommodate individual differences in styles and preferences.

**Conclusion**

This paper has presented a model of flexible learning that represents an integration of learning styles and preferences with the strategies that may be used by each of the three groups (designers, learners and supporters) we identify as crucial to the process of effective flexible learning. The indication both from research and from practice is that, for flexible delivery to be effective and to capitalise on its principal strengths, it must be designed with learner individual differences very much in mind. If truly learner-centred flexible learning is to be fully realised (along with the need for a recognition of learner differences) there is a need for specific strategies to be put into place both by designers of flexible learning programmes, and by people whose responsibility it is to facilitate and support flexible learning. Without those strategies in place, the research we have reviewed in this paper would suggest that flexible learning may not be able to deliver the outcomes expected of it.

The paper has developed a number of proposals and conceptual frameworks that will have value both for practitioners in assisting them in acknowledging and accommodating styles, and for researchers in helping to elaborate instructional design theory, cognitive/learning style theory. The study of individual differences in styles and strategies has long been an important aspect of both educational psychology and instructional psychology, and has had a concomitant impact in the fields of education and human resource development (HRD). However, there is a potential paradox in the possibility that these understandings of difference may be ignored in the development and support of resource-based learning in general, and flexible learning in particular. Modern learning technologies present new challenges and opportunities for the accommodation and acknowledgement of individual differences in styles and preferences through the adoption of appropriate instructional design, learning and support strategies. However, these same technologies can also be used to design and support learning programmes that are quite invariant across different learner groups and individuals, and that are conceptualised more as ‘broadcasts’ than as individual learning experiences.
### Table 1: The various actors and the associated strategies mapped against styles and preferences

<table>
<thead>
<tr>
<th>Actor</th>
<th>Cognitive style</th>
<th>Learning style</th>
<th>Instructional preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional designers'</td>
<td>1. Giving structured route</td>
<td>1. Grounding new learning in a context of experience (development of activist</td>
<td>1. Exposure to a diversity of experiences and problem-solving situations to allow</td>
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<tr>
<td>strategies</td>
<td>through learning (wholist style)</td>
<td>(development of activist style).</td>
<td>learners to sense their preferences.</td>
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<tr>
<td></td>
<td>2. Giving global perspective</td>
<td>2. Providing opportunity for deliberation, reflection, and articulation of</td>
<td>2. Identification and accessing of others who can provide demonstration, discussion and</td>
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<tr>
<td></td>
<td>of the content (analytical style)</td>
<td>knowledge (development of reflector style).</td>
<td>guided practice (collaborative preference).</td>
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<tr>
<td></td>
<td>3. Verbal presentation of</td>
<td>3. Access to additional information for in-depth pursuit of conceptual/</td>
<td>3. Making a wider range of learning methods available for learners to sample and gain</td>
</tr>
<tr>
<td></td>
<td>information (verbaliser style).</td>
<td>theoretical bases of taught content (development of theorist style).</td>
<td>experience and confidence in using.</td>
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<td></td>
<td>4. Visual presentation of</td>
<td>4. Clear articulation of potential application of new learning (development of</td>
<td></td>
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<tr>
<td></td>
<td>information (imager style).</td>
<td>pragmatist style).</td>
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<td></td>
<td>5. Presentation of information</td>
<td>5. Integration of reflection and theory (off-the-job learning) with experience</td>
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<td>dual mode (ie, pictorial and</td>
<td>and application (on-the-job learning).</td>
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<td></td>
<td>textual) (verbaliser and Imager</td>
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<td></td>
<td>style).</td>
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<td>6. Making structure and scope of</td>
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<td></td>
<td>content explicit as well as its</td>
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<td></td>
<td>relationship to other topic areas</td>
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<td></td>
<td>(wholist and analytical styles).</td>
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<tr>
<td></td>
<td>presentation into verbal</td>
<td>2. Acknowledgement of individual strengths and weaknesses in learning style.</td>
<td>2. Acknowledgement of individual preferences and biases.</td>
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<td></td>
<td>2. Translating verbal presentation</td>
<td></td>
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<td></td>
<td>into pictorial/diagrammatic</td>
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<td>presentation (verbaliser style).</td>
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<tr>
<td></td>
<td>1. Translating pictorial</td>
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<td>presentation into verbal</td>
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<td>presentation (verbaliser style).</td>
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<td>1. Identification and understanding</td>
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<td>cognitive style.</td>
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<td>2. Exposition of learning</td>
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<td>strategies to accommodate</td>
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<td>cognitive styles.</td>
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<td>3. Integration of cognitive</td>
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<td>styles awareness into a</td>
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<td>learning contract.</td>
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<td>4. Identification of tasks and</td>
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<td>resources to support learning</td>
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<td></td>
<td>contract.</td>
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<td>Supports' strategies</td>
<td>1. Identification and understanding</td>
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<td>cognitive style.</td>
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References


(2000b) Preparedness for flexible delivery among vocational learners Distance Education 21, 29–48.