Learning styles: a holistic approach

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Introduction

When designing, developing and facilitating learning experiences, it is often suggested that, in addition to a consideration of factors such as the organizational and environmental context, the characteristics of the learner and in particular their “learning styles” should be taken into account. The latter have attracted broad interest from human resource development (HRD) practitioners, psychologists and management development specialists. However, as will be argued, these groups do not appear to share a common underlying framework for the description of individual differences in “learning style”. As a result, theoretical and applied reviews and the research literature may sometimes appear confounded, contradictory and confusing to the majority, at least, of HRD practitioners. The purpose of this article is not to provide a comprehensive review of the literature but is to suggest a simple theoretical framework (viz. the notion of “personal styles”) which may have some value to practitioners and researchers alike.

Background

Several characteristics of the learner are often cited as factors which impact on the efficiency and effectiveness of learning: education, experience, levels of numeracy and literacy, motivation, learner’s self-concept, learning styles and so on[1,2]. Anderson, for example, argues that for learning design “the background, age, prior learning, educational level and the experience of learners are all important in getting the right ‘pitch’ to the design of the programme” [1, p. 98]. Gagne[3, pp. 256-7] identifies motivation and individual differences as two important conditions which affect the outcomes of learning. Buckley and Caple[4], writing in an HRD context, recognize age, levels of interest and ability and learning style as important aspects of individual difference. Interplay of individual differences (in terms of ability, age, learning style, etc.), the organizational context (culture, resources, learning systems and methods, etc.) and the environmental context (business environment, social factors, technological change, etc.) results in a range of learning needs at a variety of levels (e.g. individual, group and organizational). The present article will discuss the importance of individual differences, and specifically learning styles, as an important factor in the learning process at the individual level. The outcomes of the learning process in an organizational context may be considered at four levels:

1. the learner’s reaction to the learning event;
2. the acquisition of new knowledge, skills or attitudes;
3. the ability to apply new learning in a work situation;
4. the measurable effects of learning on organizational performance[5].

Individual differences

The literature suggests that differences between learners in terms of their learning styles are important in the learning process and are therefore of considerable relevance to those with responsibility for education or human resource development[3,6-9].

Newstrom and Lengnick-Hall[10, p. 46] suggest a contingency approach to HRD in which there is a move away from “characterising trainees as homologous adult learners who require a uniform and singular approach” towards an approach in which the heterogeneity of learners requires a variety of approaches depending on individual differences across important characteristics such as resistance to change, expectation levels, needs, self-confidence and attention span. Sims and Sims[11, p. 79] argue that “matching of employees and trainers possessing similar characteristics should improve employee achievement in training programmes and employee attitudes towards training ... and would increase training efficiency”.

Hence, HRD practitioners, managers and learners themselves need to be aware of the importance of individual differences in learning style and its potential impact on the success of planned/unplanned and for mal/informal learning experiences. This raises a fundamental practical question which many authors have considered: how can the issue of
individual differences in “learning style” be addressed when designing, developing, delivering and facilitating learning activities? Perhaps a crucial prerequisite to answering this question is the ability to profile (i.e. describe or “map”), within a common framework, the range of learning styles present in a given group. However, in order to profile learning styles in this way it is necessary to:

• clarify the meaning of the term “learning style”;

• be aware of the links between “learning style” and learning performance.

“Learning styles”: a blanket term
A critical aspect of individual difference, and one which is widely discussed is that of learning styles. However, different people may have differing interpretations of the term: the learner may equate learning style with “how I prefer to learn”; for example, one person may prefer distance learning methods while another may prefer role play exercises. Management development specialists may have a different perspective: they may automatically think of the styles associated with the various stages in the learning cycle as exemplified in the work of Kolb[12] or Honey and Mumford[6]. A psychologist may have a different interpretation again: the term learning style from the psychologist’s point of view may be construed as referring to an individual’s habitual way of representing and processing information in memory, i.e. cognitive style (e.g. [8,13,14]).

A number of writers have attempted to suggest a classification scheme for these various constructs[15-17]. For example, Curry[15] proposed the “onion model”: each of the layers of the onion represented one of a number of constructs with a central personality dimension at the core of the “onion”.

Personal styles
Confusion may arise when the term learning style is used on the one hand to refer to a specific construct (e.g. [6]) but also as a blanket term to subsume a variety of constructs. For example, Anderson[1, p. 99] discusses, tautologically, “preferences for different styles” and Honey[18, p. 102] of “learning style preferences”.

A more appropriate and all-inclusive term is “personal style”. An individual’s personal style may be thought of as consisting of a number of distinct but complementary attributes (the various layers of the “onion” in Curry’s model), namely:

• learning preferences (“instructional preferences”[16]);

• learning style (“information processing style”[16]);

• cognitive style (“cognitive personality elements”[16]).

It is argued here that attending to personal style in the holistic way suggested will result in more efficient and effective learning. Each of the various aspects of personal style will now be considered in turn.

Learning preferences
Learning preferences may be defined as the favouring of one particular mode of learning over another and as such are readily expressed and observed: “I just don’t like lectures – I much prefer practical classes and project work”. This is in contrast to some of the other aspects of personal styles (i.e. the deeper layer of the “onion”) which may be identified only by more formalized methods (e.g. questionnaires and psychometric tests).

Reichmann and Grasha[19] identified three learning preference styles or types:

1 dependent learners: prefer teacher-directed, highly structured programmes with explicit assignments set and assessed by the teacher;

2 collaborative learners: are discussion-oriented and favour group projects, collaborative assignments and social interaction;

3 independent learners: prefer to exercise an influence on the content and structure of learning programmes within which the teacher or instructor is a resource.

Riding and Sadler-Smith[20] investigated the learning preferences of business studies undergraduates by means of a simple learning preferences inventory. Analysis of student responses (principal components analysis) suggested a threefold categorization of learning preferences, broadly equivalent to those of Reichmann and Grasha. They suggested the following groupings of learning methods:

• dependent methods (lectures, tutorials, “surgeries”);

• collaborative methods (group working, role plays, business “games” and simulations);

• autonomous methods (distance learning, computer-based learning)[20].

This would suggest three independent scales which may be represented as in Figure 1.

Learning preferences and performance
A consideration of learning preferences raises two important questions:

1 Should learners be exposed solely to the methods they express preferences for, as opposed to the methods which they feel they learn most effectively from, but may not necessarily prefer? For example,
learners on management or professional development programmes may often express an aversion to making formal presentations to their peers but recognize that the skills to be gained from such an exercise outweigh their personal distaste for the exercise itself.

2 Should learners’ preferences be matched with the teaching and learning methods used in anticipation of positive effects on motivation (or are there gains to be made through the tension of a mismatch of learner preferences and methods?)

Mumford[22, p.16] argues that a knowledge of the learning preferences of managers can be used to provide a more appropriate experience and considers it “irresponsible simply to throw a rag-bag of activities at a group on the assumption that their learning styles will be different”. He goes on to acknowledge the difficulties that this may create for the designers and deliverers of learning. The issue raised here is whether or not HRD practitioners:

• Match the learning preferences of individuals by means of customized programmes, i.e. largely individualized methods of learning congruent with individual preferences. Gagne and Briggs[23] suggest “alternate materials and media for each [learning] objective thus letting the selection vary according to the learner’s preferences” – something which may be accommodated through the use of “self-instructional” materials.

• Attempt to match all the preferences in a given group of learners to a limited extent by means of a balanced approach to the design of learning, i.e. a variety (or “rag-bag” to use Mumford’s terminology) of methods. While the former approach may be the most desirable (and one which is becoming increasingly feasible through the use of computer-based learning technologies), the latter appears to be the most pragmatic approach. Both courses of action are preferable to failing to acknowledge the different learning preferences which are inevitably present in any group.

Learning styles
A learning style may be defined as a “distinctive and habitual manner of acquiring knowledge, skills or attitudes through study or experience”. This may be contrasted with a learning strategy which may be defined as a “plan of action adopted in the acquisition of knowledge, skills or attitudes through study or experience”. Hence style is a habitual manner (i.e. an in-built and automatic way of learning) whereas strategy is a conscious attempt to deal with a particular situation and may be derived in part from the drawbacks of the style[24].

The most widely used descriptions of styles are drawn from models of the learning process, e.g. Kolb’s model of experiential learning[12] and Honey and Mumford’s “learning cycle”[6]. Both take as their basis the Lewinian model of learning (see [12, p. 21]) and may be summarized thus:

• Stage 1: concrete experience;
• Stage 2: observations and reflections on the experience;
• Stage 3: formation of abstract concepts and generalizations based upon the experience and the subsequent reflections;
• Stage 4: testing the implications of the concepts and generalizations in new situations.

Kolb identified individuals’ learning styles by means of the Learning Styles Inventory (LSI). Honey and Mumford[6] used the Learning Styles Questionnaire (LSQ) to identify individuals’ strengths and weaknesses for each stage of the cycle and suggested four “learning styles”:

1 Activists. People who involve themselves in new experiences, tackling problems by brainstorming, and moving from one task to the next as the excitement fades[6].

2 Reflectors. Cautious and thoughtful people who like to consider all the possible angles before making any decisions and whose actions are based on observation and reflection[6].

3 Theorists. People who integrate their observations into logical models based on analysis and objectivity[6].

4 Pragmatists. Practical people who like to apply new ideas immediately, and get impatient with an over emphasis on reflection[6].
A wholly effective learner has the abilities characteristic of all four stages. Such ideal learners are rare: one style, e.g. reflective observation, may predominate with the others being used to varying but lesser degrees. Here style is non-pejorative in the sense that no one particular style is “better” than the others; however, high levels of proficiency for all four styles are desirable. The structure of the questionnaire implies four independent scales which are represented, confusingly, quasi-orthogonally (Figure 2): the scales themselves are not bipolar activist/theorist and reflector/pragmatist dimensions of learning style[25].

Learning styles and performance
Anderson[1, p. 98] suggests that any learning event can usefully start with an “inventory and discussion on learner style”, but cautions against emphasizing styles at the expense of ignoring the training system (i.e. the environment external to the individual, i.e. organizational context). By contrast, Mumford[22, p. 16] argues that learning should be placed in the forefront as an explicit activity and not just confined to “an interesting session at the beginning of a programme”. In this sense “learning to learn” is, as Argyris says, a “timeless wisdom”[26].

When compared to cognitive styles, learning styles are pejorative in the sense that most learners have a need to develop one or more of these styles to an acceptably high level: “all-round learners, or ‘integrated learners’ … are clearly best equipped to manage all four stages … most people develop learning style preferences that assist with some of these stages [of the learning cycle], and hinder others”[18, p. 104]). Honey goes on to suggest:

- a “dovetailing” of learning styles and activities (i.e. a matching of style and method) leading inevitably to individuals specializing in certain parts of the learning cycle;
- a knowledge of styles as a starting point for the self-development of a broader range of learning skills.

The latter may necessitate undertaking activities and exposure to experiences that are not congruent with one’s style but which, under appropriate guidance, lead to one’s development as a more “integrated” learner[18, p. 106]).

There is some evidence, albeit from the field of student learning (see Entwistle[21, p. 207]), to suggest that learners may benefit from having a teacher of an opposing style but may prefer a teacher of the same style. This is consistent with the approaches taken by Honey and Mumford with regard to the development of individual learning styles (see above) and raises the question of what are the effects on learning performance of matching/mis-matching learning styles and learning methods.

Cognitive styles
Cognitive style may be defined as “a distinctive and habitual manner of organizing and processing information”. A cognitive strategy on the other hand may be defined as “a plan of action adopted in the process of organizing and processing information”. The grounds for the distinction are the same as those for learning styles and strategies (the latter evolves from the former).

Riding and Cheema[17], in a survey of a number of different types of cognitive style suggested that each may be assigned to one of two principal cognitive styles’ “families”. Their approach suggests that learners differ in terms of two fundamental styles:

1. The wholist - analytical dimension of cognitive style: this describes the habitual way in which an individual processes information and is derived from the work of Witkin et al.[13]. Analytics tend to process information into its component parts; wholists tend to retain a global view of a topic.

2. The theorist - pragmatic dimension of cognitive style: this describes the habitual way in which an individual processes information into its component parts; wholists tend to retain a global view of a topic.

Schmeck[9, p. 328] concluded that “people with an extreme analytical style … have focused attention, noticing and remembering details. They have an interest in operations and procedures and proper ways of doing things and prefer step-by-step, sequential organizational schemes … They are gifted at critical and logical thinking”. Similarly people with a “global [i.e. wholist] style … [have] an attention toward scanning, leading to the formation of global impressions rather than more precisely
articulated codes ... Their thinking is more intuitive than that of an analytic person ... [they] are likely to be more impulsive ... and are more gifted at seeing similarities than differences"[9, p. 328].

2 The verbalizer – imager dimension of cognitive style: verbalizers tend to represent information in memory in “words”; imagers tend to represent information in memory in “pictorial” form[27].

These two bipolar dimensions may be considered to be orthogonal. Norms for data gathered by Riding and his co-workers from over 1,400 subjects suggest nine cognitive style types (Figure 3).

Kirton[14] describes a number of assumptions regarding cognitive style that help to distinguish it from other constructs:

• it is related to numerous traits of personality that appear early in life and are temporarily stable;
• it is bipolar, non-pejorative and non-evaluative;
• it is conceptually independent of cognitive capacity, success, cognitive techniques [strategies] and coping behaviour (functioning temporarily outside one’s habitual style).

Cognitive styles and learning
The two dimensions of cognitive style affect learning in two separate ways:

1 The verbal – imagery dimension has been shown to interact with the mode of presentation of information to affect learning performance. Verbalizers may be expected to benefit from the presentation of information in a textual form; imagers on the other hand may be expected to benefit from the presentation of information in a pictorial or diagrammatic form[28-31]. Hence, the verbal – imagery dimension of cognitive style may be used to determine the most appropriate mode of presentation of information for a given individual, i.e. the mode of presentation may be matched to the

verbal – imagery dimension of cognitive style.

2 The wholist – analytical dimension has been shown to interact with the structure of presentation of information in affecting learning performance[32].

Each aspect of this dimension has its strengths and weaknesses (analytics have difficulty “seeing the wood for the trees”; wholists have difficulty “seeing the trees for the wood”). In order to compensate for the weaknesses of each, Riding[24] has suggested that:

• Wholists may benefit from information in advance of learning which shows the structure of a topic to be learned in terms of its component parts. The advance information provides a structural, analytical map for the wholist.
• Analytics, on the other hand, may benefit from information in advance of learning that gives an overview of the whole topic. In this case the advance information serves as a map of the terrain in which the whole can be seen, and provides the holistic approach that the analytical finds difficult.

Hence, Riding suggests that learning performance may be enhanced by accommodating the two dimensions of cognitive style, and specifically by:

1 matching the mode of presentation of information to the verbal – imagery dimension;
2 providing a compensatory strategy for the wholist – analytical dimension by using differing forms of advance and/or summary information[24].

Personal styles profiling
An important first step in enhancing learning performance is the identification of personal styles. A composite personal styles profile for an individual would consist of descriptions at three levels (see below).

Learning preference profiling
It has been suggested that learning methods can be grouped into at least three categories: autonomous, collaborative and dependent[20]. Burgoyne and Stuart[33] described a study of management development programmes in which they identified nine management development methods in common use. These may be classified within the above scheme as follows:

1 autonomous: guided reading; programmed instruction (distance learning, computer based learning);
2 collaborative: games/simulations; projects; case studies; experiential; role playing;
3 dependent: lecture; seminar.

Figure 3
The nine cognitive style types

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<th>Wholist verbalizer</th>
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<td>Wholist imager</td>
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Source: [24]
Methods commonly in use within a particular organization could form the basis of a crude inventory of learning methods which may be used to assess:

- learner preferences (to give a method preference index);
- the extent to which methods are currently used within an organization (to give a method frequency index).

The respective indices for each of the three scales (autonomous, collaborative and dependent) may then be compared to gauge the degree of match/mis-match of preferences and methods used (a Preference Match Index).

Alternatively, the development of a generic learning preferences inventory (validated by means of large scale studies) would facilitate benchmarking and intra- and inter-organizational comparisons. Is it the case, as Sims[34, p. 17] suggests, that trainees with "different styles will react variously to different methods"?

Cognitive styles profiling
An individual's position on each dimension of cognitive style may be assessed using a variety of techniques (e.g. the Embedded Figures Test[38], measures field independence (an analytic style) and infers field dependence (a wholistic style) from this). Riding's computer-based Cognitive Styles Analysis (CSA)[8,39] allows the two dimensions of cognitive style to be assessed quickly and easily (including, unlike the Witkin test, a direct measurement of both aspects of the wholistic-analytical dimension). There does not appear to be any relationship between cognitive style and intelligence as very low correlations have been observed between both dimensions of cognitive style and intelligence as measured by the British Abilities Scale (see [40, p. 419]).

Personal styles and learning
Kirkpatrick[5] in his well-established framework for evaluation suggested that the worth, value and effectiveness of training should be measured at four levels:

1 reaction: the trainees' reaction to the training (i.e. whether or not they reacted favourably);
2 learning: did the training result in changes in knowledge, skills or attitudes on the part of the trainee?
3 behaviour (i.e. job performance): did the training result in improved job performance?
4 results: did the training result in any tangible result at the organizational level, e.g. reduced costs, increased quality, etc.?

Reaction
A favourable reaction, which may be anticipated as a result of matching a learner's preferences with the learning methods used, could lead to:

- greater motivation (if we consider matching as a “motivator”[41] or less dissatisfaction (if we consider matching as a “hygiene” factor[41]);
- greater willingness to participate in learning;
- over-reliance on limited range of methods and a stifling of development in “learning how to learn”.

Further research is required to investigate the validity of the “learning preference” construct and any relationship that this may have with: other aspects of personal style (i.e. learning style and cognitive style); and learning performance.
Learning
Research into the relationship between cognitive styles and learning performance suggest that the acquisition of knowledge and understanding may be enhanced through: matching mode of presentation to the verbal-imagery dimension; and providing a compensatory learning strategy for the deficiencies of each aspect of the wholist-analytical dimension.

Evidence of the effects of acknowledging differences in learning style when designing and delivering learning is extensive but largely anecdotal[6,18,22,35] as is evidence of the effects of acknowledging and accommodating learning styles on “learning how to learn”. Further work is required to investigate the link between learning styles and learning performance.

Behaviour and results level
“Learning to learn” skills and the conscious development of learning and cognitive strategies derived from a knowledge of the styles may enhance the ability of an individual to:
- recognize learning opportunities and take advantage of those opportunities;
- deal more effectively with those learning situations which conflict with her/his personal styles.

One may anticipate that the additive effect of enhanced motivation, learning gain and improved job performance would have a beneficial effect at a broader level, e.g. reduced costs, greater efficiency and effectiveness, etc. The technical difficulty of evaluation of the outcomes of learning at the behaviour and results levels is well documented[42]. To measure the effect of acknowledging and attending to individual differences in personal styles in an organizational setting would be complex.

Implications for training styles and team roles
Any consideration of learners’ styles should reciprocally acknowledge that individual HRD practitioners will themselves have their own personal styles which will impact on their own learning; and the training and learning methods which they adopt.

Whether or not learners will benefit from a trainer of similar personal style to their own is not clear. Perfect match or perfect mismatch of trainer style and learner style across a group is, in any case, unlikely given the probable spread of styles with a group. However, personal styles profiling is of value to HRD practitioners in that it may enable them to:
- identify their own styles;
- become aware of any bias or imbalance in the training and learning methods which they employ;
- design and develop learning events which accommodate, or at least acknowledge, the personal styles of the learners.

Knowledge of personal styles within the suggested framework may also be used to facilitate more effective group working through a greater awareness of team roles and management styles and adapting these on the basis of the context and the composition of the group.

Conclusion
Newstrom and Lengnick-Hall[10] argued that a congruence of learner and learning is important in realizing “payoff” from investment in HRD and such a fit can occur only through systematic assessment of trainees’ styles.

This article began by suggesting that the lack of a conceptual framework relating to the broadly interpreted notion of “learning style” is potentially confusing. It is of concern that practitioners and researchers may work outside of a unifying framework and hence may engage in cross-purposeful discussion. The personal styles framework suggested here may facilitate comparison of related aspects of HRD research and practice and provide a mechanism for the assessment of individual differences and hence put personal styles to work.

References
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