Vol x, No. x, Month Year, pp. xx-xx

Reflecting Education
http://reflectingeducation.net

Editorial: The Use and Understanding of Style Differences to Enhance Learning

Carol Evans
Institute of Education, University of London
Honorary Research Fellow Durham University

Eva Cools
Vlerick Leuven Gent Management School, Belgium

OVERVIEW

The papers included in this Special Issue are from the thirteenth annual European Learning Styles Information Network (ELSIN) conference held at the Vlerick Leuven Gent Management School in Ghent, Belgium, June 2008. One of the key aims of ELSIN is to internationally promote understanding of individual style differences through dissemination of key research in learning styles. The six papers demonstrate how, in different higher education contexts, practitioners are engaged in learner-centred approaches by using cognitive and learning styles and approaches to studying models to enhance the learning experiences of their students in education and training. Such diverse higher education contexts include: business and management education in Belgium (Cools); teacher education in Belgium (Vanthournout, Donche, Gijbels and Van Petegem); undergraduate Spanish studies in the UK (Fernández-Toro); undergraduate hospitality management in Switzerland (Charlesworth); undergraduate Business Economics and Psychology in Denmark (Nielsen, Hvas and Kjaergaard); and undergraduate and postgraduate study in Health and Social Science in Scotland (Duffy and Rimmer).

INTRODUCTION

As articulated by Cools within this Special Issue: 'understanding why people act the way they do … is essential if we are to enhance capacity for life-long learning and associated independence in learning'. Even though there is a growing body of evidence identifying the benefits to both learners and teachers of instructional interventions aimed at enhancing teacher awareness of their own cognitive styles and the ways in which such styles impact on student learning, application to practice remains limited (Evans & Waring, in press). How an understanding of styles can be integrated effectively into everyday pedagogic practice is highlighted by Hargreaves and colleagues (2005). For cognitive and learning styles models to be able to play a significant role within the personalised, student-centred, life-long and organisational learning agenda, Evans and Sadler-Smith (2006: 78) argue that practitioners need to: "cut through the swathe of terminology; hone in on those constructs and measures that are theoretically sound, reliable and valid; be critically aware of the benefits and limitations of the available models for their practice; use evidence-based practice which is scientifically robust; and work with researchers to be in a position to disseminate 'what works' effectively to a wider audience".

 ISSN 1746-9082

Broadfoot (2008) highlighted this central need for universities to pay more attention to how students learn and how best to teach them. She argues that universities have been backward in recognising the need to understand the learning process itself, and thus how they can best teach and support their students (Attwood, 2008) and that crucially important dispositions such as 'knowing what to do when you do not know what to do', a central feature of a Personal Learning Styles Pedagogy (PLSP; Evans & Waring, in press), are being squeezed out. In addition, the need to abandon 'ineffective pedagogies' (Broadfoot, 2008) in favour of new technologies more suited for the 'digital natives' of Generation Y (Shaw & Fairhurst, 2008) is required. However, the high-tech population is very diverse (Huwe, 2008) and the precise way in which pedagogies are blended to accommodate individual differences is key here.

The increasing heterogeneous nature of the higher education student body coupled with government agendas, such as those of England and Wales, focusing on personalisation (DfES, 2007); life-long learning (DIUS, 2007) and student-centred approaches (Elen et al., 2007) along with the mantras 'No child left behind' (USA) or 'Teach Less Learn More' (Singapore), one might think would lead to increased awareness and understanding of individual ways of learning and to implications for the design of curricula including assessment. Broadfoot (2008) argues that the converse is true in higher education with the personal element being very much ignored given that 'many students do not experience any kind of personal relationship with their tutors'. In England and Wales the term differentiation has largely been replaced with that of personalisation within the government's rhetoric about attending to the needs of learners. However, the actual meaning and translation of this in educational settings remains unclear (Hartley, 2008; Polaine, 2006).

If serious attention to the learning process is to be realised, then cognitive and learning styles and approaches have a place as part of this agenda. Although much attention has been afforded to the creation of effective and powerful learning characteristics (Claxton, 2007; Lucas, 2005) and learning power (Crick, Broadfoot & Claxton, 2008) in the last few years, the role of styles within this area has not been clearly elucidated. Effective learning characteristics as identified by Claxton (2007) include the following: flexibility and openness in learning situations; analysis and intuitive abilities; strategic awareness; collaboration and independence along with the importance of self-regulation and resilience in learning. With this in mind, the personal learning styles (Evans & Waring, in press) of an individual (to include cognitive styles, learning styles, strategies, approaches as well as affective elements in learning) have an important role to play especially in facilitating change through enhanced metacognitive awareness of self and others' learning (Waring & Evans, 2005) in the pursuit of more positive learning environments for both learners and teachers (Oosterheert, Vermunt & Denessen, 2002). Personal learning styles can also, in consideration with other individual differences, have a key role in enabling students to be reflective, self-critical, collaborative and responsive to change; essential requirements of learning in the third millennium, and for practitioners, enable improved practice based on better understanding of the factors affecting students' approaches, conceptions of the learning process and the possible impact of particular pedagogic strategies on learning (Cuthbert, 2005).

Within this Special Issue it is argued that, by discussing conceptions of learning with students and by considering specific cognitive styles, learning styles and approaches to studying models, such tools can be used diagnostically to enable both instructors and students to learn and communicate more effectively. In the higher education context, knowledge of student characteristics should be taken into account to build or co-construct adaptive instructional methods **with the learner** in an evidence-based manner and also used more centrally in curriculum design including induction planning. In addition, students through reflection on their own personal learning styles can, on the one hand, gain a better understanding of their own and other learners' needs and, on the other hand, learn appropriate strategies to use the most suitable approach in any given situation and to develop weaker aspects of their styles profile where necessary. Fundamentally, a styles approach is not about adapting instruction to every student's needs in all situations; it is about having at the core of curriculum design, an understanding of the importance of individual differences and an awareness of how different ways of teaching can impact differentially on students with specific styles profiles.

THE NEED FOR RIGOUR AND RELEVANCE

Cools highlights in her paper a number of central issues that need addressing in relation to cognitive styles which could equally be applied to the whole styles field. Quoting Curry (2006), she refers to three such essential areas: (a) conceptual clarification in the definitions and conceptualisations of the style concept; (b) clear demonstration and accumulation of the validity and reliability of style measures; and (c) continuous attention for the relevance of styles research for practice by providing answers to the 'so what?' question. She concludes her paper with a call to give attention to both rigour and relevance in styles research.

Intelligent and critical use of any style(s) instrument is essential when attempting to enhance individuals' understanding of their own learning (Evans & Waring, 2006). The misguided application of the concept of learning styles is clearly documented (Coffield et al., 2004; Evans & Graff, 2008; Evans & Sadler-Smith, 2005). In spite of this, many teachers and teacher educators are using learning styles tools effectively in educational settings to encourage students to reflect on learning and to develop a meta-cognitive approach (Hargreaves et al., 2005). How styles are being used effectively to support learning in higher education is another matter; application to practice of relevant and reliable approaches is an issue especially given the massification of higher education leading to increased group sizes and less contact time for students with their tutors? The four fold typology developed by Hodgkinson, Herriot and Anderson (2001) highlights the academic-practitioner divide in industrial, work and organisational psychology research. Such an approach can also be usefully applied to styles research in education. The two dimensions represented include methodological rigour and practical relevance, highlighting four research possibilities: Pragmatic Science (rigour and relevance); Pedantic Science (rigour at the expense of relevance); Popularist Science (models/approaches with little theoretical underpinnings, such as VAK, multiple intelligences, brain-based instruction; see Sharp, Bower & Byrne, 2008) and Puerile Science (approaches with little relevance using research designs and methods lacking in rigour). The need for both rigour and relevance

has to be a key driver within styles research, although as Hargreaves and colleagues (2005) have commented, there is also evidence of the successful use of approaches in schools that actually do not have solid theoretical underpinnings.

STYLES UNPLUGGED: ENHANCING OUR UNDERSTANDING OF STYLES

In terms of rigour, it is essential to clarify the style terms used within this Special Issue and to briefly outline current developments within the styles field.

In search of a clear definition of style(s)

One of the fundamental problems affecting translation and use of styles work in practical settings has been the misuse and confusion with styles terminology (Coffield et al., 2004). Clarification is required regarding key terms such as cognitive style(s); learning styles; learning preferences/orientations and strategies as these are often used incorrectly (Evans & Sadler-Smith, 2006). From the outset, it needs to be stressed that there is no one over-arching model of learning style (Kozhevnikov, 2007). What is known is that (a) any individual has the capacity to use a range of styles as part of their own Personal Learning Style (PLS; Evans & Waring, in press); (b) a style preference does not in itself exclude the use of alternative styles; (c) some styles may be more malleable than others; and (d) some learners may be inherently capable of greater style flexibility than others (Evans, 2001).

Cognitive styles are perceived as higher order constructs/heuristics and are seen as consistent differences in the ways in which individuals organise and process information (Messick, 1984). They are thought to be affected by previous experience, habits, socialisation and are seen as interacting with personality, intelligence, gender and other external variables to impact on learning behaviours (Kozhevnikov, 2007). An individual may use a number of cognitive styles as part of their PLS at a number of different levels, ranging from the simple perceptual level as to how one processes individual preferences to decision making styles and decision making behaviour which will impact differentially on the choice of strategies adopted in particular learning situations. In this way, cognitive styles influence the ability of the individual to adopt flexible learning styles as part of an overall PLS. The ways in which cognitive styles interact with internal variables and are responsive to external controls will impact on the learning approaches contributing to a PLS in any given situation (Evans & Waring, in press).

Learning styles have been seen as much broader constructs than cognitive styles and much more responsive to task and situational demands; viewed as context-specific, socialised and teachable (Nielsen, Kreiner & Styles, 2007; Sternberg, 1997). Learning styles may depend upon the personal context of past experience, gender and context (Cuthbert, 2005). The term learning style as used by Kolb (1984) and Honey and Mumford (1986) describes an individual's preference for understanding his/her experiences and transforming them into knowledge based on Kolb's model of experiential learning that postulates that the learner undergoes four stages in the process of learning (Accomodator (activist); Diverger (reflector); Assimilator (theorist); and Converger (pragmatist)). In such a theory individual

differences are based upon psychological attributes that determine the strategy the learner adopts for processing information and his/her preference for learning situations. Some would argue that the Kolb model reflects a process of learning rather than a learning style (Sadler-Smith, 2001).

The term **learning strategy** refers to the implementation of a set of learning tactics or procedures for learning (Schmeck, 1988). Individuals through their underlying cognitive styles adopt **specific strategies** within learning contexts (Riding, 1997). The complex relationships between styles and strategies is touched upon by Schmeck (1988) who argues that style partially influences approach and approach determines the learning outcome which in time may change style.

Approaches to learning refer to individual differences in intentions and motives when facing a learning situation, and the utilisation of specific strategies (Diseth & Martinsen, 2003). The approaches to studying framework built on the work of Marton and Säljö (1976) in considering deep, surface and strategic approaches to learning. Most notable work within this field include that of Biggs (1987; 2001), Entwistle (1991) and Vermunt (2007); the latter of which has recently adopted the term **pattern** in preference to approach or style to suggest the modifiability of the construct. Vermunt (2007) argues that patterns have the potential to develop over time and to vary across contexts. As such they can be socialised and modified as a 'function of the interaction of person, task and situation' (Zhang and Sternberg, 2005).

To summarise, a **personal learning style** (PLS) includes a range of cognitive and learning styles and strategies. This involves cognitive (thinking and knowing), motivational and affective (mood, feelings) and physiological behaviours and is associated with preferred working environments, approaches to studying and learning processes (Evans & Waring, in pres**s)**.

Styles as part of individual differences

As already highlighted, the relationship of different aspects of a styles profile to one another is in need of further investigation as is the nature of the relationship of style variables to contextual variables within a learning environment. Early attempts to clarify the differences between styles and strategies include Curry's onion model (1983) which has at its centre cognitive elements of personality. Within her second layer she locates information processing aspects of styles – essentially cognitive styles. The outermost layer represents learning preferences or strategies, defined by Sadler-Smith (2001) as including learning activity, learning and educational environments, and individual intention and motivation to study. Alternative attempts to classify and clarify style constructs include the work of Riding and Rayner (2000) who employ the term 'learning profile' to represent an umbrella concept to include cognitive style, learning style, learning strategies, preferences, motivation and self-perception. Zhang and Sternberg's (2005: 2) own interpretation of learning profile has led to the development of 'intellectual styles' which they define as: "One's preferred way of processing information and dealing with tasks … [it is] … to varying degrees… cognitive, affective, physiological, psychological, and sociological". Entwistle and McCune's (2004) thinking dispositions are also considered to be an

intellectual style as defined by Zhang and Sternberg (2005). Such dispositions are seen as "relatively stable traits that help to explain intellectual performance over and above measures of intellectual aptitude" (Perkins & Tishman, 2000: 269). Three necessary conditions are involved: (a) the learner's ability-capability to think effectively; (b) his/her inclination – willingness to invest effort in thinking; (c) his/her sensitivity to context-noticing occasions that call for thinking requiring open-mindedness (including having the basic capacity to see situations from more than one perspective).

Another key issue lies in the relative importance of different aspects of style on performance and in common with the individual differences literature, the difficulty of unpacking individual variables to explain effects is like looking for a needle in a haystack. How variables combine and impact on one another, is however a very important area for further study. Scholars agree that various individual characteristics affect how people behave and perform, but how these characteristics interact is less obvious (Cools, 2008; Kozhevnikov, 2007; Riding, 2000; Yates, 2000). With this in mind, more recently, the importance of affect in learning and the relationship of affect to cognitive and learning styles has been acknowledged by prominent researchers in the field (Riding & Rayner, 1998; Vermunt, 2007; Zhang & Sternberg, 2006). According to Tullett and Davies (1997), the interrelationship between cognition and affect is central to our understanding of human behaviour. Messick (1994) saw cognitive styles as bridging cognitive, affective, and social domains of functioning. Within this Special Issue, Fernández-Toro considers how strategy use is also related to affect.

Other important developments in the style field

Although cognitive styles have traditionally been seen as fixed and not readily changeable (Messick, 1984; 1996) recent work suggests that certain styles (cognitive and learning) may be more malleable than others (Kozhevnikov, 2007). To add to the confusion, approaches to studying which by definition should be more flexible in learners have had their malleability questioned (Cuthbert, 2005). The lack of longitudinal studies does little to substantiate or refute such beliefs (Vanthournout et al., 2008). When examining the nature of any change in cognitive styles, Donche and Van Petegem (2008) question whether this is dependent on the learning patterns ~~students~~students' exhibit on entering higher education. In the context of initial teacher education this is especially pertinent given the relatively intransigent conceptions of learning identified amongst pre-service teachers (Konings, Brand-Gruwel & van Merrienboer, 2006). Given that the origins of cognitive style often described as a mixture of innate and developed capacities are increasingly seen as the result of "a range of variables, [*including*]…intellectual abilities, previous experience, habits and personality traits…" (Kozhevnikov, 2007: 477); the degree of conscious choice over the development of certain cognitive styles is an area requiring further investigation.

In addition, other attributes of cognitive styles dimensions – such as context free, non-pejorative and bi-polar assumptions – have recently been questioned (Williams & Cervone; 1998; Zhang & Sternberg, 2005). Evans and Graff (2008) have pointed to the changing currency of specific cognitive styles both temporally and spatially. The non-pejorative nature of style is highly dependent on context. For example, it may well be better to be of a certain style to perform in a specific context, rather than having a balance of styles. Organisations may also promote certain styles over others and reinforce this in their patterns of recruitment and selection (Kirton & DeCiantis, 1994).

There are currently over 30 cognitive style dimensions and over a 100 learning styles models to choose from. Attempts to conflate the different models of cognitive styles into two overarching styles – wholist-analytic and verbaliser-imager – by Riding and Cheema (1991) have been useful but this is also oversimplistic as not all cognitive styles claiming to measure the same dimensions actually do (Evans & Graff, 2008). In the last five years the traditional view that many cognitive styles are bi-polar in nature has also been challenged with significant implications for training. Hodgkinson and Sadler-Smith (2003) see cognitive styles as multidimensional rather than unidimensional. A preference for one type of processing may not automatically exclude an individual from processing in another style (Evans & Sadler-Smith, 2006). Complex rather than unitary conceptualisations of style allow for an individual to be both analytic and intuitive rather than analytic OR intuitive.

Further developments within the styles field include the identification of hierarchies of styles (Nosal, 1990; Kozhevnikov, 2007). This is important because certain higher level styles may determine the flexibility with which an individual is able to choose the most appropriate lower-level style for certain situations. Such findings testify to the fact that there is neither a single unifying dimension of style, nor the operation of certain styles in isolation of one another, but rather there is a "structural relation among them"

(Kozhevnikov, 2007: 477). This relationship between distinct cognitive styles to each other is also an area that needs further exploration.

And whilst there currently is not one overarching model of styles, as identified by Zhang and Sternberg (2005: 2), their highlighting of key concepts *which* any style might have as part of its underpinnings: preference for "high degrees of structure versus low degrees of structure, for cognitive simplicity versus cognitive complexity, for conformity versus non-conformity, for authority versus autonomy and for group versus individual work", has utility in educational settings.

Another variable touched upon within this Special Issue is that of culture and how this is also related to styles. Whilst links between certain cognitive style variables and culture have been highlighted (Allinson & Hayes, 1996), Charlesworth argues that work exploring the link between culture and learning styles has been disappointingly limited. Again, the challenge of isolating individual variables presents difficulties here. In comparing the perspectives of Chinese learners for example, compared to other cultures, the role of a number of interrelated personal, cultural, social and psychological variables are also found to be of utmost importance. This was also identified by Qing and Schweisfurth (2006) who highlight how factors other than culture alone also impact on the adaptations that take place in learning and teaching where the context of teaching and learning has been found to be significant in the strategic adaptations made by Chinese learners.

Locating the selected studies within a Personal Learning Styles Pedagogy

Locating the selected studies for this Special Issue within a Personal Learning Styles Pedagogy (PLSP), it is clear that Nielsen and colleagues consider the application of the Sternberg and Zhang (2005) integrated PLS model of intellectual styles, which incorporates a number of style dimensions. Fernández-Toro, whilst not looking at any one particular model of style, considers the interaction of cognition and affect on student learning. Cools deals exclusively with issues surrounding cognitive styles constructs. Charlesworth considers students' conceptions of learning and the process of learning as identified in the model of Kolb (1984), which has been argued to represent a process of learning rather than a learning style (Sadler-Smith, 2001). Vanthournout and colleagues and Duffy and Rimmer consider approaches to studying. Both the model of Kolb and the approaches to study/learning models would figure in the outer layer of Curry's (1983) onion model, suggesting the greater influence of context and enhanced possibilities for change.

Traditionally much styles research has been of a predominantly positivist nature relying heavily on quantitative analyses. However, contemporary moves within the field are towards more mixed methodologies involving students more directly as co-researchers. The studies included here use a range of research designs: from quantitative to qualitative; self-report versus observable behaviours; third person to second person designs; imposed research design versus student involvement in research design; participant self-analyses versus researcher analysis of participant profiles. In all research projects included here there are also noticeable attempts, along a continuum, to "reconnect the theory of psychology to the actual world of education" (Sternberg, 2008: 50) through the active participation and involvement of students in the research process.

IMPLICATIONS FOR PRACTICE

The papers included in this Special Issue highlight a number of implications for practice and in so doing raise a number of pertinent issues. A central and fundamental question is the extent to which changes in styles are possible, to which styles and how? The extent to which style change is possible, transferable and sustained is still a matter of considerable debate. Learning approaches can be quite intransigent amongst some learners and even for those individuals who appear more flexible, to what extent are such changes in style sustained? As McCune (2008) comments, it is hard to be sure of lasting change in dispositions. To assist in our understanding of the potential modifiability of styles there is a strong need for more longitudinal studies as identified in this Special Issue. Researchers have found that it is possible for individuals to process information and behave in ways that are not consistent with their habitual approach (Hayes & Allinson, 1994). The concept of cognitive strategy has been used to refer to these specific behaviours people use to cope with particular situations and tasks outside their natural preferences. To what extent do strategies become encompassed into an individual's day-to-day way of working?

In developing strategies, such as training in thinking processes (De Corte, Verschaffel & Masui, 2004), to what extent are these transferable to other contexts and in order to achieve this, what are the best approaches (Masui & DeCorte, 2005)? Within the styles field, a key challenge is to be able to identify and to replicate key findings in relation to 'domain-general' thinking (theory of cognition and skills applicable to any subject/context) as well as domain specific thinking (application of knowledge and evidence to specific subjects and contexts) (Sternberg, 2008).

How one uses knowledge of styles is of paramount importance (Evans & Waring, in press). There are a number of studies that testify to the positive effect of learning about styles to impact on practice of both students and teachers (Evans & Waring, 2006; Nielsen, 2008; Rosenfeld & Rosenfeld, 2008). What all these studies have in common is the central involvement of the learner. Vanthournout and colleagues in this Special Issue highlight the utility of learning approaches in assisting the diagnosis of student learning approaches/pathologies to assist learning and the development of appropriate strategies for given contexts, which Duffy and Rimmer argue are amenable to change; this is particularly pertinent from the teacher perspective. From the student perspective, Cuthbert (2005: 246) questions whether knowledge of styles is enough to effect change: [firstly], "for any individual student, knowledge of his/her own learning style is unlikely to make a difference. It is only when this knowledge is used by the teacher to encourage the learner to consider the nature of learning ... that any impact may appear". However, he does acknowledge that student "exposure to their style or approach ... may improve their learning effectiveness **if** they go on to reflect upon the process of learning. Without such reflection, the results ... are probably of little use".

From a metacognitive perspective, perhaps, the most important question is: to what extent are learners able to use the **most appropriate** styles in any given situation as highlighted in the study of Vanthournout and colleagues where they argue that 'students not only broaden

their strategies, but also advance in their capacity to judge what strategies are most suited for a specific learning environment'. A key issue therefore lies in the ability of individuals to self-regulate and therefore be able to accurately adapt their approach to the demands of the situation and/or to delegate effectively in situations where certain cognitive styles may be less favourable to the successful completion of a task (Evans & Waring, in press). Understanding the specific requirements of the educational context is an essential skill for all learners and specific groups of students entering higher education who may be very vulnerable in being able to self-regulate their learning as identified in the Charlesworth paper.

To enhance metacognitive capacity, of which style flexibility is just one but an important component, a number of questions are raised regarding what the most effective strategies are to develop this in learners and to enable them to transfer strategies from one context to another. In enhancing 'learning how to learn' developing metacognitive capacity and self-regulation within learners is essential (Claxton, 2007). A first step towards this is increased knowledge of one's own learning.

Within this Special Issue, the papers included highlight components of a Personal Learning Styles Pedagogy (PLSP; Evans & Waring, in press), which emphasises the need to understand the nature of individual differences in the design of and delivery in learning environments where the centrality of the learner and the importance of how to involve the learner beyond a research object (Rosenfeld & Rosenfeld, 2008) is of paramount importance. Within such an approach the learner should be challenged to experiment with a variety of approaches to learning rather than perpetuating learning behaviours which may not always be most appropriate to address the demands of the task.

A key component of a PLSP is for students to learn about their own styles in a critically informed and rigorous manner using appropriate measures, leading to increased self-understanding and sensitivity to others' personal learning styles, as suggested in the paper of Nielsen and colleagues. Learning about styles in itself, as Cuthbert (2005) and Evans and Waring (in press) argue is not enough; it is how individuals utilise such knowledge and apply it to their everyday practice that is important here. Pedagogically, a critical issue is how practitioners scaffold learning in order for individuals to attend to their relative areas of weakness where and when necessary. In the study of Nielsen and colleagues, half of the students had felt better equipped by being involved in the styles research work but half had not; why? As identified by Vermunt and Verloop (1999), it might well be that a similar activity causes 'constructive friction' for one group of students, while generating a 'destructive friction' for others. By establishing the specific learning needs of specific individuals and groups, appropriate support mechanisms can be put in place.

The importance of induction and transition activities to support student learning and the early identification of style pathologies is emphasised in a number of the studies. Vanthournout and colleagues identified that learning patterns of students developed differently according to the pattern adopted in the first year of study; this highlights the importance of appropriate and timely induction. With respect to programme development at the entry level it is suggested that the development of introductory programmes that also address the difference in expectations that one might encounter between secondary and

higher education might be beneficial to the student (Charlesworth). This can allow the students to reflect on their learning and can help to develop the kind of learning culture that can move students from a "performance orientation" to a "learning or mastery orientation" (Masui & De Corte, 2005: 366). The nature of and development of assessment is also of fundamental importance in affecting students dispositions towards their study (Entwistle, 1991).

In relation to supporting student learning appropriately, Duffy and Rimmer and Fernández-Toro both refer to techniques to scaffold learning (self-error analysis; motivational support strategies). One important feature of support to note here is that of 'over-scaffolding' (Vermunt, 2007). If learners are to take responsibility for their own learning, support needs to be gradually withdrawn and amended to ensure independence in learning. Any scaffolding from the teacher should be kept to a minimum to ensure that learners take responsibility for their own learning (Fernández-Toro).

In terms of a synthesis of research findings within the styles field, frameworks have been developed which identify a number of key features that are needed to develop aspects of a Personal Learning Styles Pedagogy. Such key features include the centrality of the learner in the research process; explicit discussion and sharing of ideas about styles; listening to the student voice and encouraging learners to explore and develop their own understandings of styles in a reflectively critical and constructivist way; specific training to develop dispositions involving explicit modelling, trialling and practising across different contexts. Baxter-Magolda and King (2004) highlight the importance of contextual variables in enabling learners to develop more sophisticated conceptions of knowledge which include:

(i) respecting and connecting with students' current conceptions,
(ii) sharing authority and expertise in the learning process,
(iii) showing explicitly how knowledge is constructed,
(iv) helping students to accept provisionality and uncertainty, and
(v) cultivating thinking dispositions.

In the pursuit of (v), McCune (2008) argues that instruction needs to: avoid performance on demand; teach alertness to subtle signs; involve students in knowledge construction in authentic active learning contexts; train students in thinking processes; make ways of thinking and practising (WTPs) explicit and investigate overlap with cognition. In a similar vein, Evans and Waring (in press) outline the need to attend to five key interrelated issues to enable trainee teachers to better understand and apply styles ideas in the classroom to facilitate differentiated instruction, including: (a) exploration of teacher beliefs/modelling and support to enhance sensitivity to individual needs; (b) careful selection and application of models so as to suit the needs of specific learners; (c) creating optimal conditions for learning; (d) attending to the student voice by encouraging full involvement of learners in the process of learning; and (e) design of learning environments to challenge thinking.

CONCLUSIONS

This Special Issue highlights how researchers are using styles instruments to inform their teaching within higher education contexts. As identified previously, within styles research, the terrain is notoriously difficult to navigate for practitioners trying to use styles work effectively with their students. Whilst the terrain is constantly changing what is apparent is that there are a number of very reliable personal learning styles tools and there is evidence of effective use of these, as identified by Boyle, Duffy and Dunleavy (2003) who comment on how Vermunt's learning patterns can be generalised across different learning environments and contexts both within and across countries. But far more work is needed in relation to the value and utility of using certain tools and their impact on learning outcomes or changes in approaches to learning (Cuthbert, 2005).There is also a need for more longitudinal studies to ascertain whether such changes are maintained both within and across different learning contexts. The role of context and the relative importance of specific styles on learning and their relationship to other individual differences variables are also areas where more research is definitely required (Riding, 2000).

In relation to thinking dispositions, one of the key factors affecting student success identified by Perkins and Tishman (2000) is the ability to be sensitive to the contextual requirements of a learning situation. One way of raising cognitive sensitivity is by using a PLSP approach whereby learners are able to confront their own biases in learning and open themselves up to alternative ways of doing and/or adapt strategies to cope in situations where they are unable to be cognitively flexible in their use of styles. A key strength of robust measures of style lies in their diagnostic ability to highlight, at an early stage, learners less productive/inappropriate styles (Boyle et al., 2003). From a metacognitive perspective, styles work highlights the importance of self-regulation in affecting learning outcomes. Returning full circle to the learning needs of Generation Y, development of such self-regulatory mechanisms within learners is essential if they are to be truly independent learners.

Finally, in search of pragmatic science, meeting the imperatives of theoretical and methodological rigour on the one hand and applied relevance on the other hand (Hodgkinson et al., 2001) is essential. Far more practitioner-based research in a wide variety of settings is needed to consider the interaction of specific variables in affecting learning outcomes. In making the styles literature accessible to teachers there needs to be explicit guidance supported by research showing how one can effectively use such approaches in real settings.

REFERENCES

Allinson, C.W. and Hayes, J. (1996) The Cognitive Styles Index: a measure of intuition-analysis for organisational research. *Journal of Management Studies*, *33*, 119-135.

Attwood, R. (2008) Teaching 'unsuited' to the third millennium, *Times Higher Education*, 6 – 2 November, No. 1, 870, 6.

Baxter-Magolda, M. and King, P. (Eds.) (2004) *Learning partnerships: Theory and Models of Practice to Educate for Self-authorship*. Sterling, VA: Stylus.

Biggs, J. (1987) *Student Approaches to Learning and Studying*. Melbourne, Australia: Australian Council for Educational Research.

Biggs, J. (2001) Enhancing learning: a matter of style or approach. In R.J. Sternberg & L.F. Zhang (Eds.), *Perspectives on Thinking, Learning, and Cognitive Styles*. London, UK: Lawrence Erlbaum Associates.

Boyle, E.A., Duffy, T. and Dunleavy, K. (2003) Learning styles and academic outcome: the validity and utility of Vermunt's Inventory of Learning Styles in a British higher education setting. *British Journal of Educational Psychology, 73*, 267-290.

Broadfoot, P. (2008) *Learning for Life: an educational agenda for the third millenium*, Inaugural Lecture, University of Gloucestershire, 29 October 2008.

Claxton, G. (2007) Expanding young people's capacity to learn. *British Journal of Educational Studies, 55,* 115-133.

Coffield, F., Moseley, D., Hall, E. and Ecclestone, K. (2004) *Learning Styles and Pedagogy in post-16 Learning: A Systematic and Critical Review*. London, UK: Learning and Skills Research Centre, LSDA.

Cools, E. (2008) *Cognitive Styles and Management Behaviour: Theory, Measurement, and Application*. Saarbrücken, Germany: VDM Verlag Dr. Müller.

Crick, D.R., Broadfoot, P. and Claxton, G. (2008) *Developing an Effective Lifelong Learning Inventory: The ELLI Project*, Graduate School of Education, University of Bristol, England. Accessed 21/12/2008
http://www.bristol.ac.uk/education/enterprise/elli/research

Curry, L. (1983) An organisation of learning styles theory and constructs. In L. Curry (Ed.), *Learning Style in Continuing Education*. Halifax, Canada: Dalhousie University. (ERIC Document Reproduction Service Number ED 235 185).

Curry, L. (2006) *Enabling life long learning at work and at school: what should we do if we meant it?* Keynote address, Enabling Lifelong Learning in Education, Training and Development, Eleventh Annual European Learning Styles Information Network Conference, 12-14 June, Oslo, Norway.

Cuthbert, P.F. (2005) The student learning process: learning styles or learning approaches. *Teaching in Higher Education, 10*, 235-249.

De Corte, E., Verschaffel, L. and Masui, C. (2004) The CLIA-model: a framework for designing powerful learning environments for thinking and problem solving. *European Journal of Psychology of Education, 19*, 365-385.

DfES (2007) *2020 Vision- Report of the Teaching and Learning in 2020 Review Group*. London, UK: Department for Education and Skills.

Diseth, A. and Martinsen, O. (2003) Approaches to learning, cognitive style, and motives as predictors of academic achievement. *Educational Psychology, 23*, 195-207.

DIUS (2007) *Prosperity for the Global Economy*: *World Class Skills*. London, UK: Department for Innovation, Universities & Skills.

Donche, V. and Van Petegem, P. (2008) Variability and consistency of learning patterns in teacher education. In E. Cools, H. Van den Broeck, C. Evans, & T. Redmond (Eds.), *Proceedings of the 13th Annual Conference of the European Learning Styles Information Network*, 23-25 June, Vlerick Leuven Gent Management School, Gent, Belgium, 65-74.

Elen, J., Clarebout, G., Leonard, R. and Lowyck, J. (2007) Student-centred and teacher-centred learning environments: what students think. *Teaching in Higher Education, 12*, 105-117.

Entwistle, N. (1991) Approaches to learning and perceptions of the learning environment. Introduction tot the special issue. *Higher Education, 22*, 205-227.

Entwistle, N. and McCune, V. (2004) The conceptual bases of study strategy inventories. *Educational Psychology Review, 16*, 325-345.

Evans, C.A. (2001) The impact of teaching in a particular cognitive style on student performance. In A. Francis., S. Armstrong., M. Graff., J. Hill., S. Rayner & E. Sadler-Smith, (Eds.), *Proceedings of the 6th Annual Conference of the European Learning Styles Information Network*, 26-27 June, University of Glamorgan, UK, 206-222.

Evans, C. and Graff, M. (2008) (Eds.), Exploring style: enhancing the capacity to learn? *Education and Training*, *50*, 93-102.

Evans, C. and Sadler-Smith, E. (2006) Learning styles. *Education and Training* (Special Issue), *48 (2 & 3),* 77-83.

Evans, C. and Waring, M. (2006) Towards inclusive teacher education: sensitising individuals to how they learn. *Educational Psychology, 6*, 499-518.

Evans, C. and Waring, M. (in press) The place of cognitive style in pedagogy: realising potential in practice In L.F. Zhang & R.J. Sternberg (Eds.), *Perspectives on Intellectual Styles.*

Hargreaves, D., Beere, J., Swindells, M., Wise, D., Desforges, C., Goswami, U., Wood, D., Horne, M. and Lownsbrough, H. (2005) *About Learning: Report of the Learning Working Group.* London, UK: DEMOS.

Hartley, D. (2008) Education, markets and the pedagogy of personalisation. *British Journal of Educational Studies, 56*, 365-381.

Hayes, J. and Allinson, C.W. (1994) Cognitive style and its relevance for management practice. *British Journal of Management, 5*, 53 – 71.

Hodgkinson, G.P., Herriot, P. and Anderson, N. (2001) Re-aligning the stakeholders in management research: lessons from industrial, work and organizational psychology. *British Journal of Management, 12*, Special Issue, S41-S48.

Hodgkinson, G.P. and Sadler-Smith, E. (2003) Complex or unitary: a critique and empirical reassessment of the Cognitive Style Index. *Journal of Occupational and Organisational Psychology, 76*, 243-268.

Honey, P. and Mumford, A. (1986) *The Manual of Learning Styles: Revised Version*. Maidenhead: Peter Honey.

Huwe, T.K. (2008) International patrons embrace technology at their own pace. *Computers in Libraries, 28*, 23-25.

Kirton, M.J. and DeCiantis, S.M. (1994) Cognitive style in organisational climate. In M.J. Kirton (Ed.), *Adaptors and Innovators: Styles of Creativity and Problem Solving*. London, UK: Routledge.

Kolb, D. (1984) *Experiential Learning. Experience as a Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall Inc.

Konings, K.D., Brand-Gruwel, S. and van Merrienboer (2006) Teachers' perceptions on innovations: implications for educational design. *Teacher and Teacher Education, 23*, 985-997.

Kozhevnikov, M. (2007) Cognitive styles in the context of modern psychology: toward an integrated framework of cognitive style. *Psychological Bulletin, 133*, 464-481.

Lucas, B. (2005) *What are the learning styles of an effective lifelong learner? Should we do more to profile these?* Keynote address, 10th Annual European Learning Styles Information Network Conference, 13-15 June, School of Management, University of Surrey, UK.

Marton, F. and Säljö, R. (1976) On qualitative differences in learning: I- outcome and process. *British Journal of Educational Psychology, 46*, 4-11.

Masiu, C. and De Corte, E. (2005) Learning to reflect and to attribute constructively as basic components of self-regulated learning. *British Journal of Educational Psychology, 75*, 351-372.

Messick, S. (1984) The nature of cognitive styles: problems and promise in educational practice. *Educational Psychologist*, *19,* 59-74.

Messick, S. (1994) The matter of style: manifestations of personality in cognition, learning, and teaching. *Educational Psychologist, 29*, 121-136.

Messick, S. (1996) Cognitive styles and learning. In E. De Corte and F. Weinert (Eds.), *International Encyclopaedia of Developmental and Instructional Psychology*. Oxford, UK: Elsevier Science Ltd, 638-641.

McCune, V. (2008) *Cultivating the disposition to understand in Higher Education*. Keynote address, Style and Cultural Differences: How Can Organisations, Regions and Countries Take Advantage of Style Differences, 13th Annual European Learning Styles Information Network Conference, 23-25 June, Vlerick Leuven Gent Management School, Gent, Belgium.

Nielsen, T. (2008) Implementation of learning styles at the teacher level. *Education and Training, 50*, 155-166.

Nielsen, T., Kreiner, S. and Styles, I. (2007) Mental self-government: development of the additional democratic learning styles using Rasch measurement models. *Journal of Applied Measurement, 2*, 124-148.

Nosal, C.S. (1990) *Psychologiczne modele umyslu* [Psychological models of mind]. Warsaw, Poland.

Oosterheert, I.E., Vermunt, J.D. and Denessen, E. (2002) Assessing orientations to learning to teach. *British Journal of Educational Psychology, 72,* 41-64.

Perkins, D. and Tishman, S. (2000) *Patterns of Thinking. Project Zero's Patterns of Thinking Project.* Cambridge, UK: Harvard Graduate School of Education. http://wwwpz.harvard.edu/research?PatTHk.htm accessed 20/12/2008.

Polaine, A. (2006) *Re-imagining Higher Education*. London, UK: DEMOS. Available at http:// www.demos.co.uk/themes/~education/view//ph/4

Qing, G. and Schweisfurth, M. (2006) Who adapts? Beyond cultural models of "the" Chinese learner. *Language, Culture and Curriculum, 19*, 74-89.

Riding, R.J. (1997) On the nature of cognitive style. *Educational Psychology, 17*, 29-49.

Riding, R.J. (2000) Cognitive style: a strategic approach for advancement. In R.J. Riding & S.G. Rayner (Eds.), *International Perspectives on Individual Differences. Volume 1: Cognitive Styles*. Stamford, CT: Ablex, 365-377.

Riding, R.J. and Cheema, I. (1991) Cognitive styles – an overview and integration. *Educational Psychology, 11* (3 & 4), 193-214.

Riding, R. and Rayner, S. (1998) *Cognitive Styles and Learning Strategies: Understanding Style Differences in Learning and Behaviour*. London, UK: David Fulton.

Riding, R.J. and Rayner, S. (Eds.) (2000) *International Perspectives on Individual Differences. Volume 1: Cognitive Styles*. Stamford, CT: Ablex.

Rosenfeld, M. and Rosenfeld, S. (2008) Developing effective teacher beliefs about students: Do teachers' own individual learning differences (ILDs) make a difference? *Educational Psychology, 28*, 245-272.

Sadler-Smith, E. (2001) A reply to Reynold's critique of learning styles. *Management Learning, 32*, 291-304.Schmeck, R.R. (Ed.) (1988) *Learning Strategies and Learning Styles*. New York, NY: Plenum Press.

Sharp, J. G., Bowker, R., & Byrne, J. (2008) VAK or VAK-ous? Towards the trivialization of learning and the death of scholarship. *Research Papers in Education,* 23(3), 293-314.

Shaw, S. and Fairhurst, D. (2008) Engaging a new generation of graduates. *Education and Training, 50*, 366-378.

Sternberg, R. (2008) Applying psychological theories to educational practice. *American Educational Research Journal, 45*, 150-165.

Tullett, A.D. and Davies, G.B. (1997) Cognitive style and affect: a comparison of the Kirton Adaption-Innovation and Schutz's Fundamental Interpersonal Relations Orientation-Behaviour Inventories (KAI and FIRO-B). *Personality and Individual Differences, 23*, 479-485.

Vanthournout, G., Coertjens, L. Gijbels, D. and van Petegem, P. (2008) The development of approaches to learning of student teachers with different 'study approach-profiles'. In E. Cools, H. Van den Broeck, C. Evans, & T. Redmond (Eds.), *Proceedings of the 13th Annual Conference of the European Learning Styles Information Network*, 23-25 June, Vlerick Leuven Gent Management School, Gent, Belgium, 75-91.

Vermunt, J.D. (2007) *Student learning and teacher learning*. Keynote address, Exploring Style: Enhancing the Capacity to Learn, 12th Annual European Learning Styles Information Network Conference, 12-14 June, Trinity College, Dublin, Ireland.

Vermunt, J. and Verloop, N. (1999) Congruence and friction between learning and teaching. *Learning & Instruction, 9*, 257-280.

Vigentini, L. (2008). A matter of style? A preliminary report on the relationship between styles & the use of learning technologies. In E. Cools, H. Van den Broeck, C. Evans, & T. Redmond (Eds.), *Proceedings of the 13th Annual Conference of the European Learning Styles Information Network*, 23-25 June, Vlerick Leuven Gent Management School, Gent, Belgium, 577-598.

Waring, M. and Evans, C. (2005) *Things have to change: the necessary evolution of initial teacher training*. British Educational Association, Annual International Conference, 14-17 September, University of Glamorgan, UK.

Williams, S.L. and Cervone, D. (1998) Social cognitive theories of personality. In D.F. Barone, M. Hersen & V.B.Van Hasselt (Eds.), *Advanced Personality*. New York, NY: Plenum.

Yates, G.C.R. (2000) Applying learning style research in the classroom: some cautions and the way ahead. In R.J. Riding & S.G. Rayner (Eds.), *International Perspectives on Individual Differences*, *Volume 1 Cognitive Styles*. Stamford, CT: Ablex, 347-364.

Zhang, L.F. and Sternberg, R.J. (2005) A threefold model of intellectual styles. *Educational Psychology Review, 17*, 1-53.

Zhang, L.F. and Sternberg, R.J. (2006) *The Nature of Intellectual Styles*. Mahwah, NJ: Lawrence Erlbaum.

Correspondence

Carol Evans

Assistant Director for Learning and Teaching
Department of Learning, Curriculum and Communication
Faculty of Culture and Pedagogy
Institute of Education
University of London
20 Bedford Way
London
WC1H 0AL
020 7911 5472

c.evans@ioe.ac.uk