RUNNING HEAD: USING STYLES FOR MORE EFFECTIVE LEARNING

Using styles for more effective learning in multicultural and e-learning environments

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Abstract

Purpose – This Special Issue contains selected papers from the thirteenth annual European Learning Styles Information Network (ELSIN) conference held in Ghent, Belgium in June 2008. One of the key aims of ELSIN is to promote understanding of individual learning and cognitive differences through the dissemination of international multidisciplinary research about learning and cognitive styles and strategies of learning and thinking.

Design/methodology/approach – Three papers within this special issue consider how style differences can inform the development of e-learning opportunities to enhance the learning of all (Vigentini; Kyprianidou, Demetriadis, Pombortsis and Karatasios; Zhu, Valcke and Schellens). The influence of culture on learning is also raised in the paper of Zhu and colleagues and those of Sulimma and Eaves which both focus more directly on cultural influences on style, learning and teaching.

Findings – A number of key themes permeate the studies included in this Special Edition such as: the nature of styles; the intrinsic difficulty of isolating style variables from other variables impacting on performance; inherent difficulties in choosing the most appropriate style measures; the potential of e-learning to attend to individual learning differences; the role of culture in informing attitudes and access to learning; the development of constructivist learning environments to support learning through an understanding of individual differences; and most importantly how one can apply such insights about individual differences to inform and enhance instruction.

Originality/value – The papers in this Special Issue contribute to enhanced knowledge about the value of style differences to design constructive learning environments in multicultural and e-learning contexts.

Keywords Cognitive styles, Learning styles, Cross-cultural research, Constructive learning environments, Technology, e-learning

Paper type Guest editorial

Introduction

Whilst styles research continues to offer great promise (Revell, 2005), realising this in practice is proving much more difficult (Coffield *et al.*, 2004; Evans and Graff, 2008; Sharp *et al.*, 2008). Within the field of individual differences, the key question remains as to what contribution styles research can make? This is becoming even more pertinent given the increasingly heterogeneous nature of higher education students. A key dilemma as highlighted in the Vigentini article is: 'how can universities avoid uniformity of instruction and maintain a personalised curriculum'. In addition, can such 'personalisation' enable individuals to be more self-reliant in their learning? The metacognitive potential of styles research in raising awareness of oneself's and others' learning to increase self-regulation in learning in the pursuit of more positive learning environments for both learners and teachers must be a key goal (Waring and Evans, 2005).

Much has been made of the pedagogical value of learning styles (Hayes and Allinson, 1996; 1998; Messick, 1996; Rayner, 2000; Riding and Rayner, 1998; Sadler-Smith *et al.*, 2000; Saracho, 2000). As argued in the articles represented in this Special Issue, learning styles may have particular value in reducing inequalities between learners in multicultural and international education contexts. By using psychometric approaches it is possible to enable both learners and educators to develop insights into learning behaviour patterns, to consider their efficacy and to develop them where appropriate (Curry, 2002; Hargreaves *et al.*, 2005). For this to occur, the choice of instruments and the way in which they are used critically and in an informed manner is crucial to avoid proliferation of 'pseudoscience, psychobabble and neurononsense' as identified by Sharp and colleagues (2008). As highlighted by Kyprianidou and colleagues in this Special Edition, a key issue in instructional design is what might be the most suitable learning style model to select as not all measures are appropriate for all circumstances. The choice of learning styles model depends on the context and the nature of the learning task (Rayner, 2007).

The lack of clarity regarding what learning styles encompass as well as the lack of consistency in how terminology has been used in research have made it difficult for practitioners to apply ideas to specific contexts (Coffield *et al.*, 2004; Curry, 2000).

There are many definitions of learning styles that vary considerably in terms of the behavioural characteristics, their stability over time and context, and the degree of biological or social influences on these constructs as commented on by Eaves. According to Sadler-Smith (2001, p. 292), a general problem in the styles field is that the learning style concept is "used as a portmanteau term for a range of individual differences constructs encompassing, among other things, learning preferences, learning strategies, approaches to studying, and cognitive style". There have been several very useful attempts to clarify relationships between different aspects of style, such as the works of Curry (1983), Riding and Rayner (2000), Zhang and Sternberg (2005), and Kozhevnikov (2007). The reality is that there is still not one overarching model of style and quite possibly there never will be. The fact is that there are a number of styles that interact to impact on how we perform in different learning situations and it is the relationship of such styles to each other and to other variables that is in need of much more exploration. As discussed in the Vigentini article in this Special Edition, the ASSIST measure (Entwistle and Tait, 1995; McCune and Entwistle, 2000) accounted for less than a third of the variance in student performance suggesting the importance of other factors and the difficulties of isolating individual variables affecting performance (Rayner, 2006).

For clarification, Evans and Waring (in press), building on previous styles work, argue that a personal learning style (PLS) includes a range of cognitive and learning styles, as also identified in Riding and Rayner's (2000) 'learning profile.' Thus, a personal learning style involves "cognitive (thinking, knowing), motivational and affective (moods, feelings), and physiological behaviours, and is associated with preferred working environments, approaches to studying and learning processes". Cognitive style(s) as part of the personal learning styles profile refer specifically to an individual's habitual or typical way of perceiving, remembering, thinking and problem solving (Messick, 1994).

The measures chosen by the selected studies in this Special Issue to investigate specific style constructs and epistemologies are robust ones. An issue in designing any learning intervention is the choice of what might be the most appropriate learning style model to select given the specific learning context and the nature of the task. There is not one model that should be used in all contexts (Rayner, 2007). Three of the studies

within this Special Edition (Vigentini; Zhu and colleagues; Eaves) are specifically focusing on 'approaches to learning', otherwise identified by Entwistle (1991) as 'learning orientations' and by Vermunt (2007) as 'learning patterns' which are seen as more modifiable and more context dependent than cognitive styles. Approaches to learning are defined as individual differences in intentions and motives when facing a learning situation, and refer to the utilisation of specific learning strategies (Diseth and Martinsen, 2003). In contrast, Kyprianidou and colleagues in this Special Issue are using a variant of the Hermann Brain Dominance Instrument (HBDI; Herrmann, 1994) model that looks at both cognitive and learning styles dimensions; thisis a more overarching model that tries to take account of a range of dimensions comprising a personal learning styles pedagogy with some dimensions of the model more amenable to change than others. Sulimma in her study, which focuses on the impact of culture on views of knowledge, considers a multidimensional model of epistemological beliefs, using the Epistemic Beliefs Inventory of Schraw, Bendixen, and Dunkle (2002).

The disposition of certain styles for change suggests that educational interventions do have the capacity to effect change (Cuthbert, 2005; Nielsen *et al.*, 2007; Zhang and Sternberg, 2005). What is clear within the muddy waters of style is that some styles are more modifiable than others, and even those considered to be more habitual (i.e., cognitive styles) may be more flexible than first thought as suggested in the recent style field review of Kozhevnikov (2007). In addition, it is equally true that some individuals may have greater capacity for style mobility than others. Whether style flexibility is a necessary and essential requirement for all individuals is still open to debate (Evans and Waring, in press).

A styles pedagogy

Riding and Rayner (1998) identified the need for further research on individual differences, styles of learning, and pedagogy to stimulate a more fully developed understanding of individual differences in learning, teaching and training. Moreover, Sadler-Smith (1999, p. 171) called for future research "to investigate how individuals shape their habitual behaviours in order to cope with tasks which may not match their

preferred ways of organising and processing information and the effects that social and contextual factors have upon individual differences in [student] learning". Permeating many of the articles represented here is the need for supportive pedagogies to encourage attention to individual learning differences and to sensitise individuals to their own and others preferred learning styles. Terms such as 'personalisation' and 'individualisation' have been used more recently to describe individual approaches to learning but whether there is a shared understanding of what such terms mean is debateable (Hartley, 2008).

One approach that explicitly considers how to use styles to inform learning is that of Evans and Waring (in press), whose Personal Learning Styles Pedagogy (PLSP) addresses five key interrelated areas that need to be addressed to enable learners and educators to be able to understand and apply styles ideas in learning environments, including: (a) exploration of teacher beliefs/modelling and support; (b) careful selection and application of models to suit needs of specific learners; (c) creating optimal conditions for learning; (d) attending to the student voice by having full involvement of learners in the process of learning; and (e) careful design of learning environments.

Three studies in this Special Issue (Eaves; Zhu and colleagues; Kyprianidou and colleagues) highlight the importance of the social dimension of learning and learner-centred approaches which they argue are more likely to be afforded in constructivist learning environments. Their attention to student perceptions of the learning environment in affecting motivational strategies to succeed in learning is also highlighted as an important element of a PLSP along with attention to the specific context in which learners find themselves. Zhu and colleagues also emphasise the cumulative causation effect, arguing that as students become more experienced in online learning then their attitudes towards such forms of learning may change. The key pedagogical issue is how to familiarise and facilitate understanding from the outset building on student prior knowledge and experience. In this regard, person-centred education can be conceived as a humanistic approach that values the knowledge, beliefs, attitudes and skills that each individual learner brings to the classroom (Hargreaves *et al.*, 2005).

The promise of e-learning

Vigentini highlights the promise of e-learning in potentially being able to provide more individually tailored instruction for students and to improve both delivery and effectiveness of instruction. What is interesting from his study is that commonly held assumptions about the so called 'e-generation' were not always evident: 63 percent of the students in his study did not use or never accessed the online support material (e-package). There is evidence elsewhere that younger students (twenties) are more blasé about e-learning environments than more mature students (say, fifties), while they have higher quality expectations for the medium. Younger students may generally have been more computer-literate for longer than more mature students. Additionally, a minority of computer-literate students may prefer face-to-face instruction (Jennings *et al.*, 2007). Vigentini's paper illustrates that whatever the level of technology, human behaviour will dominate. It is interesting that, with regard to cramming for examinations using e-learning, the long, non-technological, historical tradition of cramming in the two weeks before exams continues. In addition, it does raise the question as to why this peak of cramming did not continue in the subsequent two weeks (as highlighted in Figure 1 of his paper).

Vigentini's study points out clearly the difficulties of doing a split-halves study which is desirable from a measurement perspective but not necessarily acceptable by students who will be examined in the subject. His paper also illustrates the twin poles of the electronic measurement dilemma: on the one hand aggregated data of usage which give broad, but relatively bland insights versus relatively voluminous, fine-grained data on individual usage which are more difficult to analyse in a meaningful fashion.

Kyprianidou and colleagues comment on the potential of technology to reduce time overload; but does it? Surely effectiveness of e-learning pedagogies depends on the nature and amount of on-going monitoring and support from tutors, along with the tutor's personal knowledge of individual students to ensure appropriate scaffolding. How e-learning is integrated into a blended learning environment, and how relationships are developed between learner, technology and the group including their views towards the value of the medium, are paramount. Can technology provide the tools and capacity to transform notions of learning in ways that produce healthy and

productive lifelong learners as commented on by McCombs and Vakili (2005)? Can educational systems be designed where technology can attend to diverse learners' needs? And to what extent does such accommodation result in better performance? How easy is this to measure? When examining the relationship between computer use and performance, Vigentini found correlations were small suggesting the impact of other factors and inherent difficulties associated with trying to isolate the importance of certain variables. As identified by Vigentini, more in-depth research is necessary to find out which are the most suitable measures to inform both educational psychologists and learning technologists.

The role of culture

In their forthcoming book, Daniels and colleagues (in press) focus on the influence of culture on educational theories, learning and pedagogy. Cultural differences shape our understanding of education, teaching and learning and the assumptions we make about learners. Culture has a significant impact on the adoption of learning beliefs, critical thinking and peer learning. Hence, the extent to which cultural variables interact with style ones in impacting on learning performance and behaviour is an important one (Hill *et al.*, 2000). Many educators are faced with the problem of how to handle the different ways in which students from different cultures approach learning. This increased interest in the potential external factors (such as culture, education, socialisation, social environments) that might affect style differences fits into the debate about whether styles are biologically based, the result of early learning, lifelong learning, all of these, or none of these (Furnham, 1995). More cross-cultural research is particularly needed to gain insights into these relationships and provide answers to these still unsolved questions.

Both Eaves and Sulimma highlight the fact that much of the research into learning styles reflects the Western cultural context given that the major learning styles models and measures have originated from Europe and North America (Coffield *et al.*, 2004) raising an important question concerning the validity of using learning styles models with students from other cultures (Avdeyeva and Church, 2005; Cowley, 2002; Tullett,

1997). Sulimma, in her paper, outlines how differing epistemological beliefs may influence an individual's learning behaviour, and thus guide self-regulatory cognition and engagement including the use of cognitive learning strategies. Zhu and colleagues, on the other hand, explore whether there is a cultural gap in student perceptions of online collaborative learning, and consider whether student perceptions, motivation and learning strategies change over time as a result of active involvement in collaborative e-learning environments.

The complexities of isolating individual factors are highlighted in different articles. In the paper of Zhu and colleagues it is the interaction of prior experiences of different types of learning in addition to culture that impacted on individual students having access to the e-learning environment. However, in the Eaves paper the Thai students as a group adopted less productive learning orientations than the indigenous samples suggesting transition issues and the need for appropriate scaffolding in learning to give students access. Importantly, Sulimma found it difficult to generalise across cultures given the range of cultural groups within any one country. Eaves also discusses the degree of generalisation that can be done from her study, given the small and unequal sample sizes of the different student groups.

Educational implications of the studies

The studies included in this Special Issue highlight a number of key areas to consider in the design of effective learning environments. Concerning the predictive potential and value of certain measures, Vigentini found that approaches to studying, as measured with Entwistle's (Entwistle and Tait, 1995; McCune and Entwistle, 2000) ASSIST, did have some impact on student attainment. Being aware of different approaches to learning from the outset of a course may enable the instructor to tailor learning more appropriately and help individuals to learn more effectively due to enhanced sensitivity to how they learn. As identified in previous studies (Evans and Waring, 2006; Rayner, 2000), Kyprianidou and colleagues highlight the importance of sensitising individuals to how they learn through careful discussion of style profiles. They argue that: 'Encouraging metacognition (being aware of one's own thought and learning processes)

seems to be the most important advantage that can be claimed for applying learning styles theory to learning and teaching'. There are strong arguments in favour of increasing self-awareness of students and tutors about the range of approaches that are possible in learning tasks and about their own assumptions, and to encourage them to reflect. Eaves also highlights the need for strategies to encourage critical processing.

A number of useful pedagogical questions are raised in the Vigentini paper about the value of online support systems in encouraging positive learning outcomes. Vigentini found that students who used the online system obtained better results than those who used it less or not at all. The question then has to be: how can individual students be encouraged to make greater use of online support systems provided for them? How can they be involved in the design of virtual learning environments (VLE) and how can assessment be an integral element of VLE design? Whilst it may be very difficult to isolate specific variables, the more we can learn about individual pathways in learning the more it can help us to consider VLE design. In this context, web logs might provide more detailed information about features and patterns of activity. Studies of VLE use may assist us in our understanding of learning patterns and of how the different ways in which learners navigate e-learning packages impact on their learning.

The paper of Kyprianidou and colleagues highlights the complexities of forming student workgroups according to specific variables such as styles and raises a number of important questions, such as: to what extent can group members freely choose their co-workers; which variables need to be considered in the composition of groups; or how important is the nature of the learning task. An important point raised here is that one needs to employ considerable caution when using styles to design homogeneous or heterogeneous groups given the mixed evidence in this area. As Kyprianidou and colleagues conclude: 'the issue of whether grouping based on learning styles results in better group interactions and learning is debateable'. While Kyprianidou and colleagues have addressed many of the issues concerning groups with regard to self-selection versus imposed, they did not integrate a discussion of Belbin's (1993) work which focuses on many other issues, such as group size and group roles.

The value of reinforcement in impacting positively on learning outcomes is highlighted in the Vigentini article supporting previous meta-analytic empirical studies discussed by Hattie (2003; 2004; 2005; Hattie *et al.*, 1996). In accounting for the

relative success of certain students, Vigintini comments that: 'It is entirely possible that the top performing students are simply doing many tests in quick succession to verify their knowledge, whilst poor performing students are spending much more time in a few tests attempting to 'learn the answers' in specific sections'.

Given the increasingly heterogeneous nature of higher education institutions (HEI) classrooms, especially in relation to the cultural diversity dimension, it is important for educators to be aware of specific cultural learning needs in order to provide appropriate induction and subsequent scaffolding of learning to enable all learners to have access to the curriculum as outlined in the studies represented here. Sulimma has also shown that epistemological beliefs have implications for teaching. Thus, being aware of one's own beliefs about knowledge and knowing as well as those of others might enable better teaching and learning situations and outcomes. Zhu and colleagues also emphasise the need for thorough attention to be given to individual cultural needs through the adoption of appropriate and timely scaffolding, specifically via careful structuring of learning activities and explicit guidance to students through mechanisms such as: peer tutoring, clarifying roles, or specifying sequences in learning. There is an additional question here in relation to the extent to which to add scaffolding and remove it to assist self-regulated learning (Vermunt, 2007).

Specifically in relation to international students, identifying at an early stage those who may require additional support and the areas most likely to be problematic to specific learners is key. Eaves suggests that areas that should be targeted for support are skills in relating and structuring information and critical processing of information, which are areas of cultural and educational differences between Thailand and Western cultures. She argues the need for a structured programme of additional support to develop learning strategies such as critical processing that may differ between different national education systems. Fundamentally, many of the papers with a cultural dimension call for greater clarity in the giving of information and clearer structuring of information about the concepts and overall topic coherence being studied due to studying in a second language which is applicable for all learners. Finally, educators of international students need to be aware of potential culture-related differences and challenges in order to be able to provide an appropriately supportive environment.

Conclusions

The articles in this Special Issue contribute to enhanced knowledge about the value of style differences to design constructive learning environments in multicultural and e-learning contexts. We conclude with a brief summary of the aims and findings of each of the forthcoming papers in this issue.

The difficulties to draw unequivocal conclusions from research on the use of technology to tailor students' learning experiences led Vigentini to explore the relations between individual styles (approaches to learning, thinking styles, cognitive styles) and the use of learning technology to improve learning and teaching in a Psychology course at undergraduate level. He found that the academic performance of students who used the online resources was significantly higher than those who chose to use the online materials not at all or to a lesser extent, but he could not draw straightforward conclusions about the relation between styles or approaches to learning and technology usage.

In the context of the increased attention for social-constructivist learning environments, Zhu and colleagues address the issue as to whether there is a cultural gap in student perceptions of online collaborative learning, and investigated the changes over time of student perceptions, motivation and learning strategies due to the actual involvement in a collaborative e-learning environment. As they found different perceptions towards online collaborative learning environments in the Flemish and the Chinese student group as well as changes in motivation and learning strategies after experience with the online collaborative learning experience, Zhu and colleagues stress the importance of cultural adaptations in e-learning designs before implementing them cross-culturally.

Kyprianidou and colleagues present the development of a web-based system for personalised learning (called the PErson-centred Group-Activity SUpport System or PEGASUS) and reflect on how such a system can be effectively integrated in everyday teaching and student workgroup formation. The authors are convinced of the value of systems like PEGASUS to initiate fruitful discussions among students and teachers on the role of learning styles in collaborative learning activities and group work, but also

warn against simplistic or purely mathematical applications of style theories, as group activity is a complex socio-cognitive phenomenon that can not be approached simply on the basis of students' learning styles.

To illustrate the utility of learning styles as a tool to learn more about students' learning patterns and to inform educational practices, Eaves studies the learning styles profiles of Thai and British students as well as their perceptions about studying in both countries. She found considerable differences between the learning profiles of British students and Thai students in Thailand and in England as well as varying perceptions about teaching, learner autonomy, and forms of assessment, which illustrates that educators of international students need to be aware of cultural differences and challenges to be able to provide a supportive and encouraging learning environment in the current globalised educational context.

Finally, in her cross-cultural study, Sulimma makes an interesting comparison of the epistemological beliefs, defined as individuals' beliefs about the nature of knowledge and the process of knowing, of a German and an Australian sample. Although the same factors were found in both countries, the development of epistemological beliefs differed, which might give educators a better understanding of the intercultural differences in cognitive and learning styles of their students.

The papers in this Issue identified important challenges for the effective use of styles to inform pedagogy, such as: the difficulty to differentiate the impact of styles and other individual differences on learning performance; the generalisability of findings from one culture to another and across cultures; the in-depth interpretation of the link between style differences and the usage data and feedback from VLE; or the choice of the most suitable style instrument to develop constructive, collaborative learning environments. To conclude with an optimistic note, awareness of these challenges and taking into account the evidence about the importance of individual differences for effective learning from the five highlighted studies, we believe that the papers in this Special Issue will stimulate further initiatives to design effective cross-cultural, collaborative and e-learning environments.

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