Learning in higher education – how cognitive and learning styles matter

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The cognitive and learning styles research domain is a highly complex one which has recently been the focus of rigour–relevance debates (Coffield et al. 2004; Evans and Sadler-Smith 2006; Rayner 2006). There is considerable support for the existence and value of style as a construct (Sternberg 1996) even though further work is needed to evidence greater impact on practice. This paper shares the work and experiences of one international research community – the European Learning Styles Information Network (EL SIN) and its attempts to advance understanding of the theory and application of cognitive and learning styles in higher education and other contexts. In so doing it highlights the principles around the development, collation and integration of research as exemplified by the ELSIN experience and considered by other research domains in higher education. Future directions for cognitive and learning styles research within the context of higher education are outlined along with the role of ELSIN in highlighting and leading on these.

Keywords: cognitive styles; learning styles; higher education; approaches to learning

Introduction

This paper will outline current trends in research on cognitive and learning styles by reporting particularly on the work of the European Learning Styles Information Network (EL SIN) research community, the only international forum of cognitive and learning style researchers. Key findings arising from the recent 14th ELSIN international research conference (2009) are discussed along with key priorities for development within a higher education context as well as education generally.

From the outset it is essential to clarify the meaning of the key terms used in this paper, specifically cognitive style and learning style. These terms have been subject to indiscriminate use within the literature (Evans and Cools 2009; Evans and Sadler-Smith 2006). Cognitive styles are predominantly viewed by the ELSIN research community as: ‘individual differences in processing that are integrally linked to a person’s cognitive system. . .they are a person’s preferred way of processing. . .they are partly fixed, relatively stable and possibly innate preferences’ (Peterson, Rayner, and Armstrong 2009b, 11). Learning styles are frequently confused with cognitive styles in the literature. The term learning styles is often used inappropriately as an umbrella term to include cognitive and learning styles and approaches to studying.

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The dominant perception of learning styles by the ELSIN community is that they represent: ‘an individual’s preferred way of responding (cognitively and behaviourally) to learning tasks which change depending on the environment or context . . .’ and are thus seen as malleable (Peterson et al. 2009b, 11). By way of contrast, approaches to learning are seen as bottom-up processes focusing on the learner and the task in comparison to cognitive styles which are deemed to work in a top-down (internal to external) fashion (Peterson, Rayner, and Armstrong 2009a). Approaches to learning are now more often referred to as learning patterns (Vermunt 2007) and dispositions to learn (Entwistle and McCune 2004) stressing the malleable and context-related nature of such concept(s). As such they focus on whether an individual takes a deep, surface or strategic approach to learning, as well as considering self-regulation, motivational and affective domains.

Relevance of styles research in higher education

With the commodification of higher education including the increasing diversity of the student population and agendas focused on personalisation, lifelong learning and self-regulation (Evans and Sadler-Smith 2006), an awareness of how students process information (i.e. their cognitive and learning styles) can potentially inform pedagogy to enhance student and tutor understandings. As identified by Zhang and Sternberg (2009, 292), ‘styles do matter [as] they make a difference in behaviour and performance in diverse domains of our life’. However, the potential of styles research to contribute to this agenda has to date not been fully realised (Coffield et al. 2004; Evans and Graff 2008; Evans and Waring 2009) and has often been misguided (Sharp, Bowker, and Byrne 2008), despite belief in the value and relevance of the concept (Evans and Sadler-Smith 2006; Hargreaves et al. 2005; Yates 2000). The role of cognitive and learning styles in mediating access to information has been outlined elsewhere by Riding and Rayner (1998). However, twenty-first century learning needs also require learners to be able to cope with the increasing volume of information available and the changing nature of such knowledge. In this sense, the ability to self-regulate one’s own learning and choose the most appropriate strategies for learning are vital (De Corte, Verschaffel, and Masui 2004). In addition, a key concern for higher education students across nations today is being able to access and act on the feedback they receive on their work (Boud and Falchikov 2007; Evans and Waring, 2010; Fearn 2009; Hattie and Timperley 2007; Rae and Cochrane 2008). An understanding of how cognitive and learning styles mediate access to feedback has much to offer in this area. It is also important for educational as well as other organisations to consider how they can use styles research in an expansive (to analyse learning situations) rather than a restrictive (focus on types) way, taking into account a number of interrelated areas that impact on an individual’s access to learning.

European Learning Styles Information Network (ELSIN) as a research community within higher education research

ELSIN came into existence in 1996 as a response to increasing global interests in the area of individual differences within the field of human performance. The organisation was originally formed as an association of academics and practitioners predominantly in the disciplines of education, management, psychology and other
related fields interested in promoting an exchange of knowledge emanating from the
theory, application and research into cognitive and learning styles. To this day, this
remains the key aim of the organisation. In addition, the main vehicle to achieve this
purpose has been the international conference.

ELSN conferences are characteristically small scale, specialised in relation to the
specific focus on cognitive and learning styles and divergent in relation to the variety
of academic disciplines (e.g. education, business, psychology, hospitality, ICT,
medicine, architecture) represented and countries of origin of participants. The
small scale of the conference is perceived as a key strength by participants in the way
it assists the building of a strong unified community of practice (Jawitz 2009; Lave
and Wenger 1991). In such a community it is acknowledged that all members inhabit
a number of significant communities. The adoption of an expansive rather than
restricted workplace model (Fowler 2008) is one that ELSIN is committed to in
relation to: (1) providing interpersonal support to new members from more
experienced members within the community; (2) bringing together researchers
from different disciplinary and methodological backgrounds to discuss and engage
in research activity; and (3) applying multi-dimensional models of expertise and in so
doing valuing the diverse skills of those within the organisation.

Style research: to be or not to be?

The state of styles research: issues and tensions

While styles research has been increasingly building capacity in recent years (Zhang
and Sternberg 2009), ironically the place of cognitive and learning styles within the
international community has down-shifted (Rosenfeld and Rosenfeld 2008). Two of
the most prestigious research communities in the USA and Europe – American
Educational Research Association (AERA) and European Association for Research
in Learning and Instruction (EARLI) do not acknowledge individual learning
differences and specifically styles research within their Special Interest Groups
(SIGs), preferring instead for them to become embedded and potentially lost within
such a structure.

There is a growing body of evidence that identifies the benefits of those
instructional interventions aimed at enhancing teacher awareness of their own
cognitive and learning styles. However, the ways in which such styles impact on
student learning as well as the application and transfer of these insights to practice,
remain limited (Evans and Waring 2009; Gully and Chen 2010). The reasons for this
‘relevance gap’ have been widely debated and revolve around a lack of consensual
theory, confusing terminology, difficulties in identifying valid and reliable measures,
and vague practical implications (Coffield et al. 2004; Cools 2008; Kozhevnikov
2007; Rayner 2006; Zhang and Sternberg 2006, 2009). This has led to several appeals
for style scholars to concentrate their work on certain key issues that will develop the
concept and promote consensus. Riding (2000), for instance, urged the field of style
research to: (1) identify the fundamental cognitive and learning style dimensions
within the wide range of style labels and clearly situate cognitive and learning styles
in the context of other individual characteristics, and (2) develop simple, valid, direct,
widely applicable style measures that can be linked to objectively observable
behaviour. In support of this view Rayner (2006) identifies the need to: (1) generate
a consensual theory of style differences that demonstrates construct validity, and at
the same time, and (2) seek an integration of theoretical and applied research
methodologies to produce functional theory and practically relevant findings. Curry
(2006) develops this in her vision for the establishment of three-related approaches:
(1) conceptual clarification in the bewildering array of conceptualisations of the style
concept; (2) clear demonstration and accumulation of the validity and reliability of
measures; and (3) continuous attention to the relevance of the field for practice.
Kozhevnikov (2007) argues that the style field needs a general theory of cognitive
styles which is developed in relation to current research in psychology and
neuroscience.

Cools (2009), building on previous suggestions for the advancement of the style
field, focuses on six critical issues: (1) the provision of conceptual clarification by
situating cognitive styles in the individual differences field; (2) the development of an
overarching, contextualised individual differences model; (3) the identification of the
origins of cognitive style via longitudinal contextual research designs; (4) the search
for fundamental cognitive style dimensions in the myriad of cognitive style models;
(5) the evolution from self-report questionnaires to multi-source, multi-method
approaches; and (6) the bridging of the relevance gap through the application of
different approaches to knowledge creation and knowledge dissemination.

Fundamentally, cognitive style research should evolve towards ‘pragmatic
science’, combining high theoretical rigour with high practical relevance
(Hodgkinson, Herriot, and Anderson 2001). Sadler-Smith’s (2009) duplex model
and Zhang and Sternberg’s (2005) model of intellectual styles represent efforts to do
this through the development of integrated cognitive style models. These and other
related models require further empirical testing as well as more work to show how
such models can be used in different contexts to enhance learning opportunities.

**Turning points and trends within styles: towards a paradigm shift**

Armstrong and Rayner (2002) were the first to call for a paradigm shift in the style
field by implying that a shift in methodology and conceptual development was
important in order to fill the relevance gap. From their perspective, valence is as
equally an important element for the continuation of style research in addition to
validity and reliability. Valence here means authenticity, credibility and impact,
referring to the extent to which the findings of a study are relevant to a particular
context. Validity, reliability and valence are three important elements (called ‘verities’
in their model) that should be considered in the research design and in the process of
inquiry. Currently, four key areas categorise those various attempts to facilitate a
paradigmatical shift within the styles field:

(1) strategic integration and application of theories;
(2) an integrative overview of the field of cognitive and learning styles;
(3) consensus over terminology; and
(4) comprehensive collation of research for an interdisciplinary audience of
theorists and practitioners.

The first of these is exemplified in those attempts in the last two years within ELSIN
to encourage the establishment of Research Interest Groups (RIGs; Rayner 2008a,
A RIG consists of a small group, team or partnership working towards a shared goal. The purpose being to energise research activity targeted at realising greater integration and application of theories of knowledge management, educational and organisational psychology, as well as a pragmatic research methodology for use in style research. A RIG offers a deliberate strategic option to take forward the ideas of social cognition and knowledge management as a community of practice (Wenger, McDermott, and Snyder 2002). The notion and implementation of the RIG is gaining momentum but has not been as successful to date as those joint and more informal research collaborations within the cognitive and learning styles field. The ELSIN 2009 participants identified the main barriers to be primarily a lack of time, followed by: lack of funding, other research commitments, lack of support including financial assistance from their own institutions, teaching commitments and the current issues associated with perceptions of styles research.

An integrative overview of the field of cognitive and learning styles has been presented at the latest Academy of Management conference (Chicago), entitled ‘Thinking styles in managerial learning, cognition and behaviour: an integrative overview’ (Sadler-Smith and Armstrong 2009). This symposium brought together style scholars from diverse disciplines and included theoretical, methodological, practical, empirical and critical perspectives. Activities such as these provide positive exposure, evidence-based enquiry and justification for the styles field, encouraging links between diverse disciplines and research domains.

A three-stage Delphi study has been conducted to assess how people within the style field define the concept of cognitive style and learning styles and how they perceive the future of their field (Armstrong, Peterson, and Rayner, forthcoming; Peterson et al. 2009a). There was considerable agreement amongst respondents over the value and future development of the field enabling broad commonalities around key style definitions to be distilled. This research will certainly contribute to the reconceptualisation of the style field within the broader domain of individual differences psychology.

With regards to the comprehensive collation of research for an interdisciplinary audience of theorists and practitioners there are two particular edited books that build further on the increasing maturation of the styles field with an aim to stimulate a paradigm shift:


Both of these works purport to be comprehensive, with appeal to a broad and interdisciplinary audience of academics as well as practitioners. Presented in such texts, the findings and ideas of style scholars within diverse contexts (such as higher education, business and psychology) can help to facilitate the advancement of the cognitive and learning styles field as part of the fostering of consensus over terminology and the collation and integration of research that incorporates an interdisciplinary set of theorists and practitioners and subsequent closure of the ‘relevance gap’.
Table 1 summarises the analysis of the distribution of individual paper presentations at the ELSIN 2009 conference: ‘Learning in higher education, how style matters’. Reflective of broader changes in educational research design (Brown 2009), developments in research design are evident in this data. Research within the cognitive and learning styles domain, however, remains heavily skewed towards correlational, quantitative methodology and short-term studies, although there has been a notable increase in second-person studies (from 7 to 25% over the last two years). Second-person research considers learners to be active participants in research and focuses on the choices that learners make as a consequence of styles interventions. This is in contrast to third-person research where the learner is merely seen as a research object (Rosenfeld and Rosenfeld 2008). An increase in mixed and qualitative approaches is also evident, although longitudinal and intervention studies are not well represented, a lament of Vanthournout et al. (2008).

In 32% of the empirical studies presented, the Cognitive Style Index (CSI) in both its original (Allinson and Hayes 1996) and revised form (Hodgkinson and Sadler-Smith 2003) was the preferred choice of instrument. This cognitive style measure

<table>
<thead>
<tr>
<th>Research components</th>
<th>Major categories</th>
<th>Percentage (%)</th>
<th>Minor categories</th>
<th>Percentage (%)</th>
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<tr>
<td>Study focus</td>
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<td>Intervention studies (e.g. ‘what are the effects of X intervention on a learner’s learning performance?’)</td>
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<td>Qualitative</td>
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<tr>
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<td>Time-frame Research perspective</td>
<td>Short-term ( &lt; 1 year)</td>
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<td></td>
<td>‘Third’ person (learner metacognition is not a part of the study)</td>
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<td></td>
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<td>7</td>
</tr>
<tr>
<td></td>
<td>‘Second’ person (learner metacognition is an integral part of the study)</td>
<td>25</td>
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Note: Adapted from Rosenfeld and Rosenfeld framework: analysis and distribution of ELSIN research studies (Rosenfeld and Rosenfeld 2008, 117).
assesses an individual’s position on the generic analysis–intuition dimension of cognitive style and is seen as a robust and reliable measure of styles (Coffield et al. 2004). However, recent work by Hodgkinson et al. (2009) suggests that the Rational–Experiential Inventory (REI; Pacini and Epstein 1999) may be a more appropriate measure, as it considers rationality (analysis) and experientiality (intuition) as two independent modes of processing (Sadler-Smith 2009). Furthermore, a further third of the empirical studies used approaches to learning models: Vermunt’s (1998) Inventory of Learning Styles (ILS) and the Approaches to Study Skills Inventory for Students (ASSIST; Entwistle 1997); a similar finding to that of Peterson et al. (2009a, 2009b) in their survey of the international styles research community. This is an interesting observation, as both models are technically not learning styles models; they are considering approaches to learning. Haggis (2009) has also concluded that ‘student learning research’ in the context of higher education is commonly associated with approaches to learning research. She goes on to say that: ‘although an increasingly varied range of models and theoretical approaches to understanding student learning are becoming more prevalent in the literature, discussion about research into student learning in higher education is still frequently either based on these ideas [deep, surface strategic approaches] or takes them for granted’ (Haggis 2009, 377). ELSIN plays a key role in raising awareness of the utility of cognitive and learning styles models that demonstrate rigour and relevance.

With this in mind, a key area of research growth has been in the number of studies focusing on the self-regulation strategies of learners. In such studies cognitive and learning styles have been identified as playing an important role in encouraging learners to adopt a metacognitive approach to their study. By empowering learners to use the most effective strategies in given situations, styles research possibly has its most important contribution to make (Yates 2000). With a growing focus on multiple pathways of study, including distance and e-learning within higher education, students are increasingly being called upon to take charge of their own learning. An understanding of individual learning differences which includes awareness of cognitive and learning styles can be beneficial in this respect (Evans and Waring 2009).

The multi-disciplinary nature of ELSIN needs further nurturing and expansion as identified by Zhang and Sternberg (2009, 297): ‘The enhancement of cross-disciplinary work as well as international collaboration are important in stimulating styles research to become more widely accepted’. In addition, there needs to be a greater focus on cross-cultural studies. There have been significant strides towards this with a 14% growth in the number of papers focusing on cross-cultural themes between 2007 and 2009. In terms of national representation, whilst 28 countries involving all continents of the world were represented in submissions, there were noticeable gaps. Certain European countries are under-represented (i.e. Spain, Italy and Germany) as well as particular disciplines such as health and medicine.

For all research organisations, a fundamental question is how they link effectively with other research communities and ELSIN is no exception. ELSIN members highlighted the importance of wider engagement with the research community at large as part of enhancing its impact. The nature of such wider engagement has been identified by McWilliam (2009) when she highlights the need to identify diverse and significant partners as part of ‘flocking patterns’. Key issues for all twenty-first century educational researchers have to be: what does it mean to work in an agile and
aligned way with colleagues? What should the nature of such linkages be? ELSIN needs to consider how it flocks and with whom particularly given the lack of specific/explicit pathways for styles work at most international conferences. The organisation of symposia as well as development of SIGs and RIGs within other conferences is vitally important in this respect.

The provision of sustained support for new researchers, particularly in writing for publication also has to be a key priority for ELSIN. The need for more focus within the educational research community on academic writing as a crucial part of building research capacity is also highlighted by Boyd (2008).

From a broader perspective, in identifying key areas for development, the key metathemes identified by ELSIN demonstrate congruence with the four key initiatives highlighted earlier and include: coherent theory building, methodological development and enhancing links with pedagogy. In relation to coherent theory building, the importance of rigour and rationalisation of the styles field along with efforts to consider how models can be integrated, including consideration of the relationships between different models in pursuit of a multi-dimensional framework are key priorities. However, opinions regarding the achievability of such a model are mixed (Evans and Waring 2009). Whilst it may not be possible or desirable to identify a single way forward for cognitive and learning styles research, developing a more cohesive, meaningful and workable framework is achievable and ELSIN needs to take the lead on this.

From a methodological perspective, the focus has to be on multi-method approaches. This will encourage greater use of qualitative methodologies and longitudinal studies, along with the consideration of those transitions that learners face in their learning from school to higher education and on into workplace learning.

Work considering how research on styles can be integrated within pedagogical frameworks in order to specifically consider the interaction of styles with other individual learning difference variables, including motivational, self-awareness and personality constructs is required. Enhancing links with pedagogy in this way requires greater publication of evidence-based studies demonstrating the effective use of cognitive and learning styles within education and in workplace learning. Importantly, this has to be considered along with associated challenges, tensions and implications within the context of the intense competition for copy space in top journals (Harland 2009), the increasing commodification of higher education and the demands of national funding frameworks such as the research excellence framework in England (HEFCE 2009).

Conclusion
The past 14 international conferences and increasingly diverse array of research publications that advance theory and practice are testimony of ELSIN’s extremely successful development in recent years. One of ELSIN’s key strengths is in its focus on strategies and styles of thinking and learning. However, even greater investment in international collaborative, cross-disciplinary and cross-cultural research is required to ensure integration and appreciation by researchers and practitioners in psychology and education.
Concerns about having sufficient committed individuals to lead the delivery of quality research in education have been raised by Mills et al. (2006), and capacity building within any research community is essential and of paramount importance to their future development, and ELSIN is no different in this respect. The adoption of an expansive rather than a restricted ‘workplace model’ is one that is important and something which applies to how the ELSIN community functions (Fuller et al. 2007).

Ensuring practitioner access to reliable and rigorous cognitive and learning styles research remains a key challenge particularly for ELSIN especially given the very different perceptions and the equally divergent relative perspectives on the value and quality of styles research that different organisational cultures within higher education have. Therefore, notions of academic identity and agency in choosing to research styles remain important and interesting avenues to explore (Jawitz 2009). ELSIN has a pivotal and gate keeping role in engaging researchers in rigour–relevance debates to enhance the quality of research within cognitive and learning styles.

The challenges facing ELSIN are commensurate with those facing higher education today. The educational research community needs to reconsider how it thinks about research methodologies as well as looking at patterns and ways of working across disciplines; this involves being more discriminatory in being able to identify ‘high flying flockmate capacities’ (McWilliam 2009). Particularly important are those groups and individuals who can broker relationships between seemingly disparate groups. ELSIN has a key broker role to play in this endeavour to promote high quality robust, theory-driven multi-method research in learning and cognitive styles, as well as promoting research that is applicable to educational and workplace settings and is ‘other regarding’ (McWilliam 2009) in that it is sensitive and relevant to the needs of specific contexts within and across cultures.

References


