# Innovative pedagogies series: The personal learning styles pedagogy

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# Contents

# Introduction

The personal learning styles pedagogy (PLSP) (Evans and Waring 2009; 2014; Waring and Evans 2015) is an inclusive participatory pedagogy that supports the development of the self-regulatory practice of learners and teachers. It uses an understanding of cognitive styles (how we process and make sense of information) to inform learning and teaching in school, higher education and workplace contexts. It is distinctive in bringing together understanding of individual differences in learning research through integration of education, neuroscience, and cognitive psychology (Kozhevnikov, Evans and Kosslyn 2014) perspectives. Integrating these different perspectives to support an understanding of cognitive style and how this can be applied in practice has not been done before (Sternberg 2014). Importantly, the PLSP addresses the need for a clear articulation and understanding of what a 'styles' pedagogy comprises (Cools *et al.* 2009; Evans and Cools 2009; Evans and Graff 2008; Evans and Sadler-Smith 2006).

The key aim of this report is to highlight current thinking in cognitive styles and to demonstrate how these ideas can be applied in practice; an area which is currently underrepresented in the literature (Goswami 2006). Therefore, in this report I will outline how the explicit PLSP framework and associated pedagogical tools can enable practitioners to use this learning and teaching approach within and across contexts. I will also outline how the PLSP can be used to support enhancements in assessment practice.

The PLSP represents an integrated approach informed by research and practice within school, higher education, medical, and teacher education contexts. It has particular resonance in supporting learner strategy development and has value in assisting learners to manage the many learning transitions that are integral to their education, personal, and professional lives. The PLSP provides a holistic approach to pedagogy. The PLSP draws on a number of theoretical frameworks: constructivist (Hatzipanagos and Warburton 2009), socio-cultural (Gipps 2002), socio-critical (Butin 2005) and on-going applications of the model within practice (Evans and Waring 2006, 2007, 2008, 2011a; b; c; 2012; Evans 2013b; Evans and Waring 2015).

# The importance of cognitive style

In 21st century learning environments learners need to be able to manage complex, unfamiliar, and constantly changing environments. The phenomenal growth in the availability of information (ECM 2014; King 2011) facilitated by ongoing rapid technological change requires learners to be able to navigate vast amounts of knowledge and information. In order to be able to access, critically synthesise, analyse, selectively store, and retrieve information, an understanding of how we process information is imperative, and yet relatively little attention has been given to how an understanding of cognitive styles can contribute to enhancing pedagogy (Evans, 2015c).

Intuitively we know and can clearly see that there are differences in the way that individuals approach cognitive tasks (Kozhevnikov 2007). Differences in the way that individuals process information can affect learner performance; cognitive styles matter (Zhang, Sternberg, and Rayner 2012). While there is no doubt about the existence of cognitive styles given neuroscientific evidence (Kozhevnikov, Evans, and Kosslyn 2014), effective translation of an understanding of cognitive styles into practice has been hampered by the sheer complexity and the obfuscate nature of the cognitive styles research field. Lack of consensual theory, confusing terminology, difficulties in identifying reliable and valid instruments, and vague practical applications have all limited the potential for integrating styles into practice. This problem of effective translation of ideas into learning and teaching has also been confounded by reviews of the cognitive styles field which themselves often lack rigour and a thorough understanding of the field they are critiquing (see Kozhevnikov, *et al.* 2014 for further analysis of this). There is, however, a considerable body of robust cognitive styles research that has direct relevance to learning and teaching environments (see Evans and Waring 2012 for a review of the literature on styles).

# What is cognitive style?

Cognitive styles are about how individuals process information; they represent individual differences in cognitive functioning (Kozhevnikov et al. 2014; Waring and Evans 2015). Cognitive styles involve the interaction of specific cognitive abilities, and personality traits, with the surrounding environment. Therefore, they constitute environmentally sensitive individual differences in cognition that help learners adapt to their environment(s). For example, individuals can influence their environment through using their own ways of processing, and they too are influenced by the environment which can help to shape their cognitive styles. Because of a preferred way of processing, a learner may choose to specialise in a certain discipline, and in turn the discipline may shape an individual's preferred processing styles. Therefore, cognitive styles can be developed, although it is also evident that some individuals are more capable of style flexibility than others.

There are many influences that have an impact on cognitive style development including family, schooling, professional work context, societal affiliations, local cultures, and also as members of a global society. The relative influence of these many environmental layers may vary according to individuals. What we do know is that if certain ways of processing have been rewarded, we are more likely to fine-tune and rely on these favoured ways of processing information. It is when existing ways of processing do not enable us to be successful that we may be forced to consider other ways of approaching tasks and situations (for example, moving to a different context (culture; employment etc.).

How an individual filters information, and moves between different cultures reinforcing and/or adapting his/her cognitive styles profile is important in understanding and supporting learner development, especially within 21$^{st}$ century learning environments. Signorini, Wiesemes, and Murphy have argued that one's multicultural being is better symbolised as a single knitted coat with different types of thread (Signorini *et al.* 2009, p. 258). These cultural layers serve to support reinforcement and/or the development of cognitive styles.

To make the most of learning environments, style flexibility (the ability to use the most appropriate styles in a given context), and to be able to adapt to the requirements of a specific context, is an important attribute of successful learners in managing their self-regulatory behaviour. Zhang (2013) has argued that style flexibility is related to an individual's repeated and recurrent use of an approach over an extended period of time and being challenged within learning environments. Challenge is also facilitated through exposure to new and different environments, which is referred to as "boundary crossing" (for example, taking on a non-traditional field or roles that are traditionally played by other groups - for example, at gender, cultural, social, functional, and/or professional levels). To be able to support learners to use the most appropriate cognitive styles, and to develop style flexibility where required, it is essential to have an understanding of what cognitive styles are, how they operate, and how they are relevant to the particular aspect of learning and teaching that is the focus for development.

Fundamentally, we *do not have one way of processing,* that is, one cognitive style. Each individual can use a *range of cognitive styles*. However, in practice we may rely on a relatively narrow range. It is, therefore, not possible or advisable to try and match a learner's style *per se*, given that each individual uses a range of styles (some use more than others), and the fact that styles change means individuals can develop their own styles.

Cognitive styles *operate at a number of levels of information processing* from how we see, hear, feel things (perceptual level), to concept formation, decision-making, and metacognitive levels (being able to adapt our styles to suit the requirements of the context). Cognitive styles can also be grouped into four *types* or *families* according to their function, and these families operate at all four levels of information processing. Figure 1 provides a few examples of styles located at different levels of processing and in different cognitive style groups. It is possible to locate styles in most of the cells of the matrix which once again demonstrates that we do not have one style; we have many that we can use.

| Cognitive styles groupings Families | Context-dependency vs. independency | Analysis vs. intuition | Internal vs. external locus of control | Integration vs. compartmentalisation |
|---|---|---|---|---|
| Level of information processing | | | | holist-analytic |
| Perception | field independence-dependence | reflexivity-impulsivity | | holist-serialist levelling-sharpening |
| Concept formation | | | | breadth of categorisation |
| Higher order cognitive processing | abstract-concrete adaptors-innovators | convergent-divergent analysis-intuition sequential random | extrinsic-intrinsic motivation | deep-surface approaches |
| Metacognitive processing | mobility-fixity | high analysis and high intuition | | |

**FIGURE 1 THE STYLES MATRIX (ADAPTED FROM KOZHEVNIKOV, EVANS, AND KOSSLYN 2014).**

One group of cognitive styles is referred to as *context-dependent versus context-independent*. This refers to your ability to perceive things as separate versus inseparable from their context. For example, knowing whether a plane is level without looking out the window; identifying objects that are hidden in other shapes (field-dependent vs. independent). A second group of cognitive styles – *analysis vs. intuition* considers how you scan information; whether you can identify similarities and differences in things and how you come to your conclusions (that is, to what extent do you follow certain rules in an analytic or more intuitive way). Examples of styles within this category include analytic – intuitive; reflexive-impulsive; convergent-divergent. A third group of cognitive styles focuses on whether your *locus of control is internal or external* (an example of this would be intrinsic versus extrinsic motivation). A fourth group of styles considers whether you prefer a *compartmentalised, sequential approach to information processing or an integrative holistic approach* (one example of this style would be holist (an approach that favours looking at the bigger picture in order to make sense of the details), and analytic (a preference to consider the specifics of a context)).

There is a debate as to whether visual and verbal styles can be located within these existing style groupings, or whether a fifth grouping of cognitive styles is needed (Kozhevnikov *et al.* 2014). What we do know is that it is not possible to be visual or verbal as these areas do not compete with each other in cognitive processing. The concept of grouping individuals as visual, verbal or kinaesthetic cannot be supported. Instead, it is possible for you to be highly visual and verbal as this dimension is not bipolar, meaning that you are not one thing or the other (that is, visual or verbal) (Kozhevnikov, Kosslyn and Shephard 2005). For a detailed analysis of specific cognitive styles look at Kozhevnikov *et al.* (2014) and Waring and Evans (2015).

In synthesising what we currently know about cognitive styles informed by cognitive psychology, neuroscience, and education perspectives, Table 1 provides a summary of what this means for our practice. Fundamentally, using a styles approach involves focusing on the best way to teach a specific task rather than trying to tailor teaching to the styles of the learner; what styles do the requirements of the task need, and how can we best demonstrate these? While being mindful of individual differences in processing, we also need to ensure that learning environments are adaptive rather than adapted, meaning that learners have

choices as to how they navigate and use learning environments, ensuring a degree of autonomy and choice to support learners in self-regulating their own learning.

<table>
<tr><td style="background-color:orange"><strong>1 A styles pedagogy (Evans 2015d)</strong></td></tr>
</table>

**A styles pedagogy involves…**

1.  placing the ***student at the centre*** of the learning process;
2.  understanding that cognitive styles are about how an ***individual processes information***;
3.  acknowledging that all learners have a ***styles profile***, and that they can develop their styles. Learning environments should, therefore, be ***adaptive*** rather than adapted. Challenge and modelling of different styles facilitate flexibility in learning although some learners are more flexible than others;
4.  ensuring the most ***appropriate representation of material*** in relation to the requirements of a task rather than attempting to match learners' styles;
5.  emphasising the development of ***styles that are most appropriate for the context***, modelling these styles, and providing opportunities to develop them;
6.  considering ***discipline-specific core threshold concepts*** and potential stumbling blocks for learners;
7.  clarifying what a ***deep approach*** *looks like* within your discipline; what constitutes good?
8.  promoting ***access to information*** by ensuring ***explicit*** guidance in how to navigate opportunities within the learning environment (for example, clarifying the role of the learner in the process; how a programme fits together; what are the principles underpinning it; ensuring access to resources; networks of support);
9.  supporting students ***to build connections between existing and new knowledge***. Preparation prior to class is important;
10. engaging students with ***doing*** (for example, manipulating information; presenting and processing in different ways);
11. supporting learners to ***self-regulate*** their learning through a focus on how they learn; identifying ***effective strategies*** to support ***learner autonomy***;
12. exploring ***learner beliefs, values, and expectations about learning*** including ***motivational*** **and** ***emotional*** dimensions of learning as part of self-regulation;
13. ensuring a ***range of assessment opportunities***;
14. supporting students to manage assessment including ***self-assessment*** and feedback;
15. ensuring ***meaningful assessment***: students as producers of ***meaningful*** products;
16. seeing learning as a ***collaborative venture*** with learners and teachers working together to support independence and ***co-construction*** in learning.

# The personal learning styles pedagogy framework

The PLSP comprises five interrelated components of practice and provides a holistic framework in which to examine different aspects of teaching. Key components of the personal learning styles pedagogy include:

1.  exploration of student and teacher beliefs/modelling and support;
2.  careful selection and application of styles to suit the requirements of the learning context;
3.  optimising conditions for learning;
4.  design of learning environments – to promote an integrated approach to the application of cognitive styles to learning and teaching;
5.  supporting learner autonomy: offering choices in learning and listening to the student voice (See Table 2 for a full outline of each subcomponent see pages 187-214 in Waring and Evans 2015).

The PLSP framework can be used to support the design of learning environments and curricula. It can also be used to support the development of specific aspects of practice (for example, critical reflection; assessment and feedback; development of resilience). The framework can be used as a diagnostic tool to identify gaps in the nature of learning and teaching provision. Sharing the framework with learners can support co-regulation of learning and better understanding of the learning context and requirements.

Fundamentally the PLSP supports the learner to self-regulate their own learning. The PLSP is underpinned by a number of core principles (Evans and Waring 2009; Waring and Evans 2015):

> the importance of guided and informed choice for learners (Jones and McLean 2012; Sadler 2010);
> the centrality of the learner in the process (Butin 2005; Chen and Liu 2012; Newcombe and Stieff 2012);
> recognition of the unique starting points of learners (Bloomfield 2010; Wong and Nunan 2011);
> the importance of explicit guidance (Scott *et al.* 2014);
> the need for concrete and appropriate exemplars to contextualise learning events (Grossman, Hammerness, and McDonald 2009);
> the need for reinforcement and transference of ideas to new contexts (Ure 2009); opportunities to observe different ways of seeing and doing (Ellis, Goodyear, Prosser, and O'Hara 2006).

| 2 The personal learning styles pedagogy framework (adapted from Evans and Waring 2015) | | |
|---|---|---|
| **Components of a personal learning styles pedagogy** | | **Subcomponents** |
| **A. Exploration of student and teacher beliefs/modelling and support** | | |
| | (i) | Focus on the learning histories of the learner (student and teacher). (Balasooriya *et al.* 2011; Evans and Waring 2009; 2014; Suphi and Yaratan 2012) |
| | (ii) | Consideration of the whole (holistic) experience of the learner. (Evans and Waring 2009; Rychly and Graves 2012) |
| | (iii) | Exploration of learner beliefs about learning. (Evans 2014, 2015a, b; Wang, and Byram 2011) |
| | (iv) | Enhancing learner awareness and application of styles. Understanding of individual differences central to the design of learning environments. (Wilson and Kittleson 2012) |
| **B. Careful selection and application of styles** | | |
| | (i) | Judicious and informed use of styles models. (Coffield *et al.* 2004; Evans and Waring 2012; Yates 2000) |
| | (ii) | Critical analysis of styles. Styles models used as metacognitive tools to support understanding of learning. (Evans and Waring 2009; Kek and Huijser 2011) |
| | (iii) | Awareness of the interdependence of cognitive style and other individual learning differences. (Blazhenkova, Becker and Kozhevnikov 2011; Furnham 2012) |
| | (iv) | Cognitive styles as an integral element of culturally responsive pedagogies. (Evans and Waring 2011b; Hardaker, Jeffery and Sabki 2010) |
| **C. Optimising conditions for learning/ sensitivity to learner context** | | |
| | (i) | Recognition of learners' unique starting points. Addressing the emotional dimension of learning. (Evans and Sadler-Smith 2006; Landrum and McDuffie 2010) |
| | (ii) | Supporting students during important learning transitions. (Scott *et al.* 2014) |
| | (iii) | Care afforded to how the level of cognitive complexity is managed to support learner flexibility. (Chang and Yang 2010) |
| | (iv) | Supporting learners' integration into communities of practice. (Evans and Vermunt 2013) |
| | (v) | Consideration of learners' networks of support and identity development. (Bliuc *et al.* 2011a,b) |

| D. Design of learning environments | | |
|---|---|---|
| | (i) | Housekeeping attended to (resource organisation, availability and information). (Evans 2013b; Scott *et al.* 2014) |
| | (ii) | Teaching methods attuned to the requirements of the content and context. (Kolloffel 2012; Riggs Mayfield 2012) |
| | (iii) | Learners supported to think within a specific discipline. (Evans and Waring 2011a,b,c,d, 2012; Kek and Huijser 2011; Nelson Laird and Garver 2010). |
| | (iv) | Judicious use of accommodation of cognitive styles and the concept of matching. (Allcock and Hulme 2010) |
| | (v) | Promotion of the most appropriate cognitive styles for specific contexts. (Matthew, Taylor and Ellis 2012; Riggs Mayfield 2012) |
| | (vi) | Teaching strategies aimed at stretching the learner through careful addition and removal of scaffolding. (Cegielski, Hazen and Rainer 2011) |
| | (vii) | Designs focused on encouraging learners to adopt deeper and more self-regulated approaches to learning. (Zacharis 2011; Zhang, Sternberg and Rayner 2012) |
| | (viii) | Emphasis on enhancing awareness of different learning strategies through explicit guidance and exposure to diverse learning experiences. (Mohr, Holtbrugge and Berg 2012: Pham 2012) |
| | (ix) | Authentic and appropriate assessment designs. (Evans 2013a; Van Bragt *et al.* 2011; Watters and Watters 2007) |
| | (x) | Appropriate use of technology to support learning. (Akbulut and Cardak 2012; Yilmaz Soylu and Akkoyunlu 2009) |
| E. Supporting learner autonomy: choices in learning/student voice | | |
| | (i) | Focus on the centrality of the learner as a co-constructor of knowledge. (Chen and Liu 2012) |
| | (ii) | Focus on the role of the learner in managing the learning process. (Betoret and Artiga 2011) |
| | (iii) | Learner control afforded through design of curriculum. (Jones and McLean. 2012; Phan 2011) |
| | (iv) | Flexible programme and assessment designs.(Costa and Sandars 2012) |
| | (v) | The importance of guided choice for learners. (Evans 2013; Evans and Waring 2009; Leithner 2011) |
| | (vi) | Informed and responsible use of groupings. (Akyol and Garrison 2011; Betoret and Artiga 2011) |

One of the key aims of the PLSP is to promote an informed use of cognitive styles by acknowledging overarching principles in the application of styles to learning and teaching. This involves focusing on the development of styles that best meet the requirements of a specific learning task and context rather than trying to match the styles of the learner.

It is, therefore, about supporting the specialist development of knowledge and skills to meet the requirements of a specific discipline. Through an understanding of how they learn, individuals are supported in the development of self-regulatory skills in order to be able to adapt and transfer new learning to other contexts. To promote learner self-regulation, styles approaches and strategies are explicitly modelled with learners. Learners themselves are given significant opportunities to critique the relevance of such approaches, practice and apply them to different learning contexts. Styles instruments, if used at all with learners, are used judiciously to support understanding of the learning process. The PLSP approach is firmly rooted in an inclusive view of differentiation, where differentiation is perceived as proactive in ensuring curriculum design is applicable and accessible to all learners (O'Brien 2000; Waring and Evans 2015, p. 110). Understanding how you learn through a cognitive styles lens is an essential aspect of this.

Supporting learners to become more meta-cognitively aware of their own learning processes through knowledge and understanding of cognitive styles is central to the PLSP framework (Evans and Waring 2009; 2011d). Learners need to know that:

1. cognitive styles are complex and are predominantly multidimensional.
2. different style constructs measure different dimensions as style as explained previously in relation to the matrix (different levels of information processing and different cognitive style processes as represented by different style groupings or families).
3. the development of specific styles may be more or less relevant to certain contexts.
4. preference for one type of processing does not preclude development of alternative processing options.
5. cognitive styles can be developed, however style specialisation may be more appropriate in certain contexts.
6. the range of cultural contexts that an individual inhabits impacts on individual use and development of styles.
7. cognitive styles interact with other variables.
8. greater awareness of cognitive styles can enable individuals to make more informed decisions about their learning and support the development of learner autonomy.

(Evans and Waring 2009; Waring and Evans 2015)

In summary, I have outlined that all learners have the potential to use a range of cognitive styles and at different levels of information processing. In the completion of certain tasks the choice of cognitive styles used may be critical hence the need to be meta-cognitively aware of what styles are best to use in specific circumstances. While style flexibility is to be encouraged as part of life-long learning agendas, it is possible that in certain situations (requirements of job role; degree of specialisation required) that flexibility may not desirable or required. Style specialisation and even inflexibility may be more appropriate depending on one's role and level of expertise required. Understanding how cognitive styles work enhances an individual's ability to self-regulate their own learning and is a central concern of the PLSP.

# How this practice evolved

A key element of effective functioning in 21st century super-complex learning environments is knowing and managing what you do not know (Barnett 2011). Ideas for the PLSP initially emerged from research undertaken within the school context in investigating students', trainee teachers' and colleagues' learning. It

was evident within the school context that learners did not only perceive the same information differently to one another, they were also using different strategies to address learning tasks. Furthermore, certain forms of assessment disadvantaged some students more than others within the classroom. Trainee teachers also varied significantly in their ability to navigate new learning contexts and there were significant variations in the relative ease with which teachers integrated new ideas into their practice. Investigation of this phenomenon led to new understandings of the role of cognitive styles in learning and especially at important learning transition points (for example, learning new concepts; working in different contexts). The concept of cognitive styles has particular relevance to professional training environments. The PLSP has been used in higher education, medical and education contexts to support learners in managing important learning transitions.

# How the PLSP has been used

The PLSP has been used in a number of ways to facilitate understanding of the learning process. It has been used to develop innovative curricula across disciplines (Evans and Waring 2006; 2015); to design effective assessment practice within higher education (Evans 2013a; 2015a, b; Evans and Waring 2011e, 2015); to examine the relationships between cognitive styles and teachers' attitudes and approaches to differentiation (Evans and Waring 2011d); to explore the impact of cognitive styles, gender and culture on students' feedback behaviour and preferences (Evans and Waring 2011a, 2011b); to examine the relationships between teachers' cognitive styles and teaching styles (Evans 2004); used meta-cognitively to support learners understanding of their own learning profiles in order to promote enhanced self-regulatory practice (Evans and Waring 2006; 2007; 2015; Evans, Zhang and Waring 2015); within initial teacher education to examine conceptions of good teaching and to explore understandings of differentiation (Evans and Waring 2008); to examine the (re)design of initial teacher education (Evans and Waring 2009); and finally, to support the professional development of learners in higher education and professional learning contexts (Waring and Evans 2015).

## Applying the PLSP to assessment and feedback practice

In this section I will demonstrate how the PLSP has been used to inform assessment and feedback practice.

### Assessment

In using the PLSP to support holistic assessment practice (Evans 2013a; 2014; Evans 2015a; b; Evans and Waring 2011e, 2015; Evans, Zhang and Waring 2015) the relevance of the feedback landscape conceptual framework (Evans 2013a) has been used to consider how individuals manage feedback. Design elements that have been included in programmes to address assessment needs include the following elements:

> ensuring an appropriate range and choice of assessment opportunities throughout a programme of study;
> ensuring guidance about assessment is integrated into all teaching sessions;
> ensuring all resources are available to students via virtual learning environments and other sources from the start of a programme to enable students to take responsibility for organising their own learning;
> clarifying with students how all elements of assessment fit together and why they are relevant and valuable;
> providing explicit guidance to students on the requirements of assessment;
> clarifying with students the different forms and sources of feedback available including e-learning opportunities;
> ensuring early opportunities for students to undertake assessment and obtain feedback;
> clarifying the role of the student in the feedback process as an active participant and not as purely receiver of feedback and with sufficient knowledge to engage in feedback;
> providing opportunities for students to work with assessment criteria and to work with examples of good work;

> giving clear and focused feedback on how students can improve their work including signposting the most important areas to address;
> ensuring support is in place to help students develop self-assessment skills including training in peer feedback possibilities including peer support groups;
> ensuring training opportunities for staff to enhance shared understanding of assessment requirements.

(Evans 2013a; Evans, Zhang and Waring 2015).

### Feedback

Clarifying the nature of a deep approach to learning to teach within 21st century learning environments (Evans 2014; 2015) is important in supporting professional development within the workplace. Identifying the relevance of cognitive style in supporting feedback seeking and using skills (Evans 2013a) has enabled principles of good feedback (Evans 2013a) to be applied across disciplines to inform programme design within higher education. Supporting early career teachers, as part of professional development, to enhance their relational skills to successfully navigate new and complex learning environments (Evans and Waring 2015) has impacted on teachers' perceptions of resilience within the workplace and crucially their ability to translate this practice and support their students to become more self-regulatory. The importance of working with learners to support the development of critically reflective practice and resilience building including emotional regulation of learning has been emphasised in current work (Evans 2015a; b; c).

In using a cognitive styles approach to develop feedback practice it has been possible to identify the characteristics of effective feedback seekers (Evans 2012; 2014). Effective feedback seekers focused on what was good, refused to give up, visualised a better place of where they needed to get to when they felt disempowered to make changes in their current context, sought comparisons, asked for help, managed control/ownership issues and made the most of what their environments had to offer. Savvy feedback seekers shared a number attributes; they:

> focused on *Meaning making* (understanding principles vs. 'going through the motions' making appropriate use of learning strategies)
> *self managed* (prioritised workload / targets)
> demonstrated *Perspective* (were able to make sense of feedback through effective filtering)
> were good at *Noticing* (making the most of opportunities)
> demonstrated *Resilience* (self-awareness – self monitoring)
> managed their *Personal response to feedback* (fit within organisations/personal adjustment – self-concept/identity)
> demonstrated *Personal responsibility* in FB/ FF process.
> *adaptable* (ability to transfer and adapt feedback to different contexts.

(Adapted from Evans 2012; 2014)

Examining these constructs with learners has been useful in supporting the development of self-regulation of feedback and especially the emotional dimension of feedback practice.

# How this practice is situated theoretically

The personal learning styles pedagogy (PLSP) (Evans and Waring 2009; 2014, Waring and Evans 2015) combines cognitivist and socio-cultural theoretical perspectives (Cobb 1994; Packer and Goicoechea 2000; Saxe 1991; Tynjälä 1999) and social critical theory (Butin 2005). The framework is the outcome of evidence-based research and practice in naturalistic settings over the last 15 years, including the systematic analysis of 707 full peer-reviewed journal articles from a total of 9073 articles (Evans 2013b; Evans and Waring 2012). Emerging from the use of the PLSP framework, specific learner outcomes have highlighted the importance of

the development of resilience which incorporates emotional regulation and effective boundary crossing skills in later permutations of the model (Evans and Waring 2014).

# How others might adapt or adopt this practice

The PLSP can be used as an overarching tool to examine support for learners and to explore specific elements of practice (for example, assessment, critical reflection and self-regulation). The components and subcomponents of the PLSP have been mapped to the Teachers' Standards (DfE 2011) and the UK Professional Standards (UK PSF) (HEA, Guild HE, Universities UK 2011) to enable practitioners in any discipline within higher education to be able to focus on developing a specific aspect of learning and teaching as well as being able to apply the underpinning principles of the whole approach within their specific learning and teaching contexts. The PLSP framework encourages learners (students and lecturers/teachers) to explore what a deep approach to learning and teaching is within disciplinary contexts and how an informed understanding of cognitive styles can facilitate this. Detailed elaboration on each of the components and subcomponents can be found in Waring and Evans (2015, pp. 187-214).

The following considerations are important in using a styles approach as an integral part of pedagogy.

**Ensuring access to information; the perceptual level is the gateway to accessing information.** We know that individuals perceive the same information in different ways and therefore ensuring information is accessible to all is essential in providing learners with access to learning. At the perception level it is important to consider potential barriers to learners' access to information. Important strategies may include: slowing down the speed of slide transitions; reducing complexity of information; reducing the number of channels of information (for example, images, music, graphics etc.) so as to not overload the learner; limiting potential distractions; ensuring clarity of visuals and text; ensuring the viewing window size and layout of information is accessible; accommodating learners' different speeds of processing – providing learners with access to materials preceding the learning context; and providing learners with a route map to explain how the programme is organised and what their role is in this. Key theories that have relevance here are those of working memory capacity and dual coding (Paivio 2006). There is a limit to how much information we can process; information exceeding working memory capacity will not be processed or transferred to long term memory. To support effective processing of information and transfer into long term memory we need to make sure that the initial information is not too complex; that new information connects to the existing knowledge that the learner has so they can attach new learning to it. We should aim to focus on essential concepts so as to not overload the learner in order for the information to be processed effectively and transferred to long-term memory where it can be effectively stored and accessed. Encouraging learners to adapt received information into alternative formats (for example, concept maps; diagrams; poems; graphs; equations etc.) enables information to be stored in both visual and textual forms, which can enhance memory.

**Supporting learning transitions.** New learning environments/situations are challenging for all learners and may lead students to fall back on established ways of learning- which may not necessarily be the most appropriate to maximise learning opportunities. The emphasis needs to be on supporting learners to improvise and to be creative without resorting to habitual modes of functioning when under pressure (Weick, 1993). Strategies that may be useful include: explicit consideration of students' beliefs,  values and expectations about learning from the outset; supporting students to build connections between existing knowledge and new information and ideas; ensuring environments are not too cognitively complex from the outset; incrementally building complexity throughout a programme of study; clarifying with learners the principles underpinning the course design; working with students to develop programmes, and explicitly demonstrating to students how all elements of the programme fit together.

**Individuals can use a range of styles, and styles can be developed.** Cognitive styles operate at different levels of information processing from perceptual to metacognitive processing levels. To develop style

flexibility it is important to ensure that learners are exposed to a range of styles and that there are opportunities for learners to apply these different styles within and across contexts. Modelling of new approaches and sufficient opportunities to practice these in authentic learning environments is important. Development of style flexibility is linked to ensuring sufficient challenge in learning environments. Some learners will have more capacity to flex their styles than others; it is important to look at strategies to enable learners to manage contexts, especially where they are unable to sufficiently manipulate their styles.

**All learners have a styles profile and can develop their styles.** Therefore, style matching (matching instruction to the style of the learner) may be of limited utility. It is important to develop the styles that are most appropriate for the completion of a specific task to meet immediate and long term goals. It is important to establish what the core threshold concepts are within the specific discipline, what cognitive styles these require; and where the potential stumbling blocks might be for learners in developing their understanding.

**Learning environments should be adaptive rather than adapted** in order to afford opportunities for all to thrive. By ensuring environments are adaptive it is important that all resources are available from the outset to enable learners to have agency and autonomy in managing and interacting within their learning environments to suit their needs.

**It is not essential to use styles instruments with learners.** If using styles instruments with learners it is important to consider the reliability and validity of tools and to use these in a critically informed way to support understanding of the learning process, rather than using instruments to label learners. For example, students may choose to use both surface and deep approaches to learning; these are characteristics of the learning process and not characteristics of the learners; this distinction is important.

**Supporting student self-regulation** is important in the promotion of sustainable learning within and beyond the limits of the programme. Explicitly modelling critical reflection tools and valuing self-assessment as part of summative assessment are important in supporting self-regulatory practice. Exploring with students their academic networks of support is important in opening up learner access to new and relevant information, new networks of support, and awareness of potential partnerships within and beyond the limits of the programme.

**Holistic integrated assessment designs.** Early assessment opportunities are needed to support the development of student self-assessment practice and to check learner understanding, to clarify what is good, model different ways of achieving required outcomes, and to support the learner in the process to manage their own learning. Supporting students in learning to maximise feedback giving and using opportunities is important (Evans 2014); peer engagement (formative use of assessment) rather than peer assessment (summative use of assessment) is an important element of this (Evans 2015a). Ensuring a range of assessment opportunities and integrating formative assessment throughout a programme is helpful. Summative assessment should be formative in 'feeding up' into further study and/or professional practice.

# Conclusion

The PLSP is a research-integrated comprehensive framework that explicitly addresses how to incorporate an understanding of styles into practice within higher education and professional learning contexts. The PLSP makes a significant contribution in making cognitive styles concepts accessible for those seeking to enhance pedagogy. Cognitive styles play an essential part in learning. Understanding how to incorporate an understanding of styles into pedagogical practice is essential within 21st century learning environments in order to support learners to become effective self-regulators. To enable metacognitive processing, we all need an informed understanding of how we learn, if we are to effectively develop our own and others' learning potential throughout the life-course (Sadler-Smith 2012). The PLSP can be used to inform the design of entire programmes as well as specific elements of practice such as self-regulation; assessment and resilience. Importantly, the PLSP is an example of a culturally inclusive pedagogy (Rychly and Graves 2012) in

that it uses the cultural characteristics, experiences and perspectives of diverse learners, and builds a pedagogy incorporating this understanding of individual differences, with the intention of ensuring that all learners have access to the learning and teaching environment.

**Note:** For colleagues interested in using this approach a detailed exposition of the framework and concrete examples of how it can be applied can be found in Waring and Evans (2015). Please contact Carol Evans directly at c.a.evans@soton.ac.uk if you are interested in collaborative research and practice within the area of cognitive styles and assessment practice.

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