Dyslexia as cognitive style: right-brained strategies for left-brained tasks.

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Abstract

The case studies which this paper presents are the work of on-going research (Davies, 2001) into the learning difficulties of students studying in Art & Design. Our rationale for the project reframes the dyslexic profile as one whose features constitute a cognitive style.

It has been recognised for some time that the art schools attract a high percentage of dyslexic students and this is reflected in the raised awareness amongst tutors of the relationship between cognitive styles and the students' learning experience. Since the 1962 Coldstream Report, which heralded the degree status of the art school courses, there has been a burden of responsibility placed upon them to legitimise their acceptance into the mainstream of academia by demanding a written dissertation (of anything between 5000 and 10000 words). The legacy of this policy has been to divorce theory from practice. For students studying in Art & Design, this is experienced as a split between two modes of learning: between the studio environment, where they are assessed on tasks which require and facilitate visual-spatial ways of working, to the linear format of the theory module, where their knowledge is assessed through tasks which require a high level of verbal fluency. Our basis for the case studies is that this division mirrors a perceived dichotomy between left- and right-brained modes of cognitive processing. This has implications, both for the learning difficulties of the dyslexic students and the teaching strategies of their dissertation supervisors.

In the School of Art & Design, we have focused on developing alternative approaches to the traditional written dissertation required in the area of Historical & Contextual Studies. The hypothesis is that it might be possible to encourage students to structure a dissertation in a way that is more compatible with their preferred learning strategies derived from cognitive styles which favour the wholist/visual, whilst still maintaining the required degree of academic rigour. Our case study students have completed dissertations which illustrate visual structuring strategies and alternative means of presentation of a visually-driven argument.

The first outcome from these studies has implications for the learning and teaching practice of both dissertation supervisors and learning support tutors who work with our dyslexic students. A second outcome of this project, therefore, is to offer, through a pack of supporting materials, strategies for both supervisors and support tutors, which are oriented towards students' individual cognitive styles. In this way, we aim to enable tutors to work with their students' strengths and meet their students learning needs.

Key Words Dyslexia, Cognitive Style, Visual Spatial Learners, Dissertation-object

INTRODUCTION

"The main theme to emerge…is that there appear to be two modes of thinking, verbal and nonverbal, represented rather separately in left and right hemispheres, respectively, and that our educational system, as well as science in general, tends to neglect the nonverbal form of intellect. What it comes down to is that modern society discriminates against the right hemisphere." (Roger W. Sperry, 1973 in Edwards, 1982:209-229)

It has been recognised for some time that the art schools attract a high percentage of dyslexic students and this is reflected in the raised awareness amongst tutors of the relationship between cognitive styles and the students' learning experiences. (1) The rationale for the case studies which this paper presents reframes the dyslexic profile as one whose features constitute a cognitive style. At Swansea Institute, we have been conducting a research project on the possible link between dyslexia and cognitive style.

It is generally acknowledged that the legacy of the 1962 Coldstream Report has been to divorce theory from practice. For students studying in Art & Design, this is experienced as a split between two modes of learning: between the studio environment, where they are assessed on tasks which require and facilitate visual-spatial ways of working and the linear format of the theory module, where their knowledge is assessed through tasks which require a high level of verbal fluency. Our basis for the case studies is that this division mirrors a perceived dichotomy between left- and right-brained modes of processing material. This has implications, for both the learning difficulties of the dyslexic student and for the teaching strategies of dissertation supervisors. Initially, our case study was to rest on the hypothesis that a dyslexic student is likely to have a cognitive style which is visual-spatial and wholist, all functions of the right brain.

Riding & Rayner (2000:8) offer a definition of cognitive style as "an individual's preferred and habitual approach to organising and representing information." They make a clear distinction between 'style' and 'strategy': where the latter refers to the coping mechanisms which reflect the cognitive processes, an individual's cognitive style, they suggest, is fixed and has a physiological basis. The project at Swansea takes the Riding and Rayner construct of two style dimensions: the wholist-analytic and verbal-imagery (Figures 1 & 1a).

Krupska and Klein (1995) illustrate the dyslexic learning style (Figure 2)

Significantly, given the learning context for our case study students, Riding and Rayner (2000:7) cite Hamblin's (1981) comment that study skills should not be taught "with the aim of raising the level of achievement [and] should not be regarded as a search for a single correct 'way to do it'." Hamblin (1981:21), it is noted, advises teachers that their work is about:

> "encouraging pupils to engage in a long-term process of building a style of learning which is meaningful and productive. Pastoral care embodies the ethic of a profound respect for individuality. To try to impose a learning style is the pedagogic equivalent of imposing a false self upon someone – an act which is inevitably as destructive in the long run."

The traditional dissertation requires the writer to take a critical stance as the objective, third person. (Wood, 1998) From this standpoint, it is difficult for the student of art and design to find a place for the self, the 'I' in their writing. In their art practice, students find a unique voice through the visual language of their chosen medium.

In the School of Art & Design, we have focused on developing alternative approaches to the traditional written dissertation required in the area of Historical & Contextual Studies. The hypothesis is that it might be possible to encourage students to structure a dissertation in a way that is more compatible with their preferred learning strategies derived from cognitive styles which favour the wholist/visual, whilst still maintaining the required degree of academic rigour. Our case study students have piloted a format which illustrates visual structuring strategies and alternative ways of presenting a visually-driven argument. The results are dissertations which explore the material qualities of the dissertation as object.

CASE STUDIES

The two students chosen for our case studies were both studying Surface Pattern Design. They each completed paper-based questionnaires (see Appendix). The 'Learning Style Inventory', (2) adapted from Holloway (2000) assessed the students' learning styles under the categories of 'Visual', 'Auditory' and 'Physical/Motor', while a second questionnaire identified whether the student had a left-brained or right-brained preference. Alongside these assessments, we also administered the 'Cognitive Style Analysis', devised by Richard Riding (1991).

Given that we were working with art and design students, we expected that their cognitive style profiles would be visual-spatial and wholist. Surprisingly, this turned out not to be the case with our two students, Sabra and Louise:

Profiles:	**Sabra**	**Louise**
Cognitive Style:	**Analytic Bimodal**	**Wholist Bimodal**
Learning Strategies:	**Multisensory**	**Multisensory**
Hemispheric preference:	**Right brain**	**Right brain**

The striking clue to Sabra's orientation was the pen tucked behind her ear, which she was rarely without. Early interviews with her revealed that, in the studio, she worked with both image and text; she liked working with words and collecting new words. Words were integral to her creative process and this was reflected in the way Sabra talked about her difficulties with written text in visual terms, as though the words themselves were objects to be manipulated. However, when she returned to her notes, written on scraps of paper, she found it frustrating, because, she said, "I don't know what they are" and, in talking about her problems with spelling, Sabra described how she 'made up words': "I think I draw words". Similarly, she talked about the shapes of words, for example, cut out from a handkerchief – it was not always enough to write words down: "I want them to become something". There is some sense of this, also, in comments such as, "I couldn't remember the name of the word".

In one of our study support sessions, Sabra described how she memorised an event by attaching meanings to objects with which it was associated. Her ideas were generated through a similar technique of verbal association and, for this reason, she very early

on found that semantic maps (Figure 3) were a useful tool in her planning. Louise, whose cognitive style, like Sabra's, included the biomodal (visual/verbal) element (as per her profile), found concept maps (Fig. 4)

a more effective form of planning. As spatial tools, both types of mapping are appropriate for visual and for verbal learners. Mortimore (2003) notes that the semantic map is useful in building vocabulary and in helping students use words to predict and organise. They are, however, particularly valuable for analytic verbalisers in helping them see the links between topic areas.

This highlights one of the problem areas for analytic thinkers. While they are good at breaking material down into its essential parts, they often get lost in the detail. In contrast, the wholistic thinker, as Riding and Rayner (2000) note, tend to organise information into loosely clustered wholes. While wholists, then, can quickly grasp the overview of a topic, they are not so able to trace out the sequential thread of an argument. This was certainly the case for Louise; she was not able to lay out the steps which led her from one idea to another and this may be why she found it so difficult to develop her thinking from the initial idea. Mortimore (2003:118) points out that, while many dyslexics are natural wholists, they may have gravitated towards this approach out of perceived, or existing limitations in memory for detail. "An extreme wholistic thinker will have trouble finding the facts or details to support overall assumptions and may well struggle to remember lists of facts."

Sabra's problem came from the opposite end of the spectrum. Very early on in her dissertation writing she found it difficult to make sense of the wealth of detail she accumulated and to put it into any kind of logical order. Study support was often a process of what Sabra called 'mending' her writing. In part, this reflected the type of difficulty, experienced by dyslexics, with syntax and sequential order (Davis, 2002; Silverman, 2002), in part, it related to her feeling that everything was in 'bits'. This meant that Sabra had great trouble keeping hold of an overview and, for this reason, she was always reluctant to wipe anything out. Decisions to delete material were almost wrenched out of her: "Do it!"; "Get rid of it!"

Riding and Rayner (2000) cite research which shows that analytics do not work easily from computers as the "restricted 'viewing window'" exacerbates their tendency to see things in parts. During our sessions, Sabra kept a sense of the overall structure by making written notes on her hard copies and scanning the pages, which she then checked against the computer version. (In fact, this study support tutor, who happens to have an analytic component in her cognitive style, often found herself clinging on to these hard copies in those moments when the dissertation seemed to be running away with itself!)

Louise's experience was typical of the wholist who, as Riding and Rayner (2000) note, is less able to impose a structure on material. They cite research (Douglas and Riding, 1993) which shows that wholists benefit from advanced organisers, such as section headings and Mortimore (2003) recommends schema, or overviews and writing frames (of which she gives a number of examples), to provide scaffolding for ideas, all methods designed to aid prediction. Louise was very aware of her limitations and we used a variety of strategies to help her structure her material. She insisted, from the start, on working to clear goals with each step planned out under section headings. We took five, or ten minutes at the beginning of our sessions to put the new topic, or conceptual area, in the context of the current work. This was supported by concept maps and flow charts, the latter an invaluable tool in helping her to see a line of development between her ideas.

Sabra's problem is typical of the analytical thinker who cannot readily build the whole picture from its parts. It was a struggle for her to find a structure for her work and to keep track of the threads of her argument. This manifested itself in her habit of keeping her laptop and all her notes with her at all times, which she carried around in

a huge bag. Her answers to the questions on hemispheric preference anticipate this trait, in particular, Question 12, (see Appendix Study Skills Sheet) where an additional comment notes that she 'likes to have everything around her' and her own response to this was to remark that she had not yet unpacked all her boxes from the last house move.

Unlike Louise, the problem was exacerbated by Sabra's reluctance to impose an order on her material. In our discussion of her studio work, she revealed that she did not follow the sequential format for the visual diary (kept by all art and design students) where each step of the design process was clearly set out. She was not happy with the idea of giving the diary a hierarchical order, as this would mean "choosing which came first". This left her with a "pile of photographs" and a "pile of papers". A visual system of colour coding solved the problem and she went on to use this in her written work.

The print-outs of Sabra's writings are a rainbow of colour. (Figure 5)

We quickly exploited the technique as a means of organising her material: key words and ideas, and, later, as her writing built up, extended paragraphs, were highlighted in the colour which corresponded to her section headings. These last were, as she said herself, the key to Sabra's organisation and they formed the basis of the final structure for the written element of her dissertation.

How do we reconcile Sabra's cognitive style analysis with the 'typical' dyslexic profile. Silverman (2002) notes that visual-spatial people may also be very articulate verbalisers. Sabra commented that she 'heard' quotes in her head. In the field of Neuropshychology, it is becoming clear that the right hemisphere has a role in the reading process and there is evidence for the role of the right hemisphere in processing semantic information. (Robinson, 2001) This is supported by Gardner (1993:83), where he draws on studies of brain damage in children to explain the localised functions of language processing and recognition:

> "Specifically, individuals dependent on the analytical mechanisms of the right hemisphere proceed almost entirely from semantic information; they decode sentences in the light of meanings of the principal lexical items, while proving unable to utilize cues of syntax. Only those whose language exploits left hemisphere structures prove able to pay attention to syntactic cues such as word order."

Whilst as a wholist, Louise's profile fits more closely with the features of the dyslexic student's cognitive style, like Sabra, she worked with both image and text. In contrast to Sabra, however, for Louise, the written word acted as a 'back-up', rather than as an integral part of her creative process. Louise benefited most from the verbal mode in

discussion, which she found very helpful in generating ideas. She commented that, when she worked at home, where she had no opportunity to talk about her ideas, she frequently had 'blocks' and was unable to move forward in her thinking.

In her writing, as in her art practice, Louise began with an image and our discussion sessions were most useful when they were combined with concrete visual images. Abstract concepts were hard for Louise to work with and, similarly, she found it difficult to get at the meanings of words she could not visualise. Davis (2002) posits two kinds of thought: 'verbal conceptualisation' and 'non-verbal conceptualisation'. He points out that, "It is impossible for a non-verbal thinker to think with words whose meanings can't be pictured." Gardner (1993) suggests that, when the mind is conjuring metaphoric images, it is engaged in a right-brained activity. Ornstein (1997) carried out studies, using EEG scanning of brain patterns, which showed that the left hemisphere was activated both when the subject (an intern at his San Francisco laboratory) read technical material and when he read folktale narratives, but only the right hemisphere was active when 'Ace' read the folktales. Ornstein notes that, while the technical material was almost exclusively imageless, the story engaged right-brained attention through its images and feelings. In Louise's case, it was striking to see how she lit up when we worked from her visual images; she was able to pick out the links between them and see the shape of her argument.

For Sabra, too, the starting point for her thinking was always the visual image. When it came to organising her visual material, she could immediately 'see' how they should be laid out and so felt confident to experiment. Louise was less sure of herself and this was, in part, due to the fact that the onus was on her to create a structure for her dissertation and she had moments of anxiety that there was no set format for her to follow. In Sabra's case, her photographs, which formed the body of her work, framed the structure and the format for her dissertation.

It appears that the visual organising strategies, identified and described in the case studies, are of immense help to dyslexic students, especially if they are introduced by the dissertation supervisors from the initial research phase of the dissertation project. Weeks of abortive attempts to structure essentially visual information in a verbal way might be avoided. It was certainly the case with another of our students, Becky, who, after many attempts struggling to formulate her argument and lay out her chapter headings in a linear, logical manner, experienced a significant breakthrough the moment we spread her collected visual data (a bundle of photographs) around the floor. She immediately took control, arranging both the latent main thread of her argument, as well as several 'sub-plots', with clarity and precision in a matter of minutes. She *saw* the structure!

Another clear insight which will have a positive effect upon teaching strategies is the recognition that the formal properties of the 'dissertation-object' – those qualities of size, shape, proportion, colour, texture, even weight, with which art and design students are constantly engaged in their studio practice – can themselves be marshalled to clarify, and even enhance, the dissertation's argument. Not so much a case of form following function, as form *mirroring* function.

In Sabra's case, the dissertation began with a cross-cultural review of attitudes towards death and memorial. The dissertation-object itself, an exquisitely-printed set

of annotated photographs in the typographic style of the most tasteful of funeral directors, was designed with utmost sensibility towards the size, weight and texture of papers - opaque prints, interleaved with translucent text through which the images became a visual metaphor for fading memories of precious loved ones. Her hypothesis – can photographs function as memorial? – is sustained before a word is read.

Louise addressed the familiar argument concerning the disputed differential in social status between 'Craft' and 'Art' in a most refreshing way, by directing the reader's attention to the similarities and differences of the very material basis for those activities: cloth and canvas. Of course, canvas *is* cloth, which allowed her to neatly put the argument to bed! The dissertation-object, needless to say, was designed to be constructed out of various cloths and canvasses of differing social values.

The result of these case studies has been manifold: firstly, a raised awareness and understanding, by students, of the relationship between their learning styles and modes of working, secondly, by supervisors, of the value of teaching strategies which match the diverse learning needs of their students and thirdly, the introduction of staff development seminars to disseminate best practice in this important area.

Given the limited number of pilot studies undertaken, no authoritative conclusion can be made, but the long-held general assumption that dyslexic art and design students have a strong visual bias to their cognitive style profiles has effectively been challenged – both pilot case studies reported here were of students with Bimodal (Visual/Verbal) tendencies. However, it is clear that both benefited by employing visually-oriented structuring strategies. It may well be that whatever learning strategies are good for dyslexics are good for everyone. Becky, by the way, is not dyslexic.

END NOTES

1 The current debate on the value of the written dissertation for dyslexic students in art and design attests to this recognition.
2 The inventory was administered in the light of Riding and Raynor's (2000) distinction between cognitive style and learning strategy

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APPENDIX