



Drawing and Visualisation Research

LEARNING TO PERCEIVE: INFORMING PEDAGOGIC PRACTICE THROUGH THE EMPIRICAL STUDY OF DRAWING

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Drawing in STEAM

INTRODUCTION

This paper is the result of collaboration between psychologists with an interest in the cognitive processes underpinning drawing activity (Chamberlain, McManus and Brunswick), a dyslexia support tutor (Rankin) and an art school lecturer in drawing (Riley). It reports on a small-scale, 'pilot' workshop, designed to test the pedagogical strategies specifically designed for dyslexic students, with a cohort of volunteers from across the Royal College of Art, London. The workshop consisted of drawing activities specifically designed for dyslexic/dyspraxic students, carried out over a period of three days at the RCA, July 2012. The call for volunteers specified participants who felt their drawing skills to be inadequate, and who had been recently identified as dyslexic or dyspraxic. Five respondents who fitted the criteria formed the full sample of workshop participants.

Our literature search revealed no alternative methods for garnering data about the efficacy of teaching drawing to dyslexic/dyspraxic art and design students, and so this experiment offers an original contribution to the field of drawing pedagogy.

Mastery of observational drawing appears to be of importance to both art students and practitioners by enhancing perceptual processing regardless of an artist's specialist medium (Kozbelt, 2001; Seeley & Kozbelt, 2008). In a recent study, 64% of a cohort of 82 art students stated that improving their observational drawing skills whilst they were at art school was very important to them (Chamberlain, 2012). This improvement may be achieved through the use of evidence-based teaching strategies which develop from an increased understanding of the perceptual processes underlying drawing ability. With that in mind, the current study assessed the contribution of figure-ground dependency and perception of simple angular and proportional relationships in relation to drawing accuracy.

It was found that a bias toward enhanced figure-ground independency and toward accurate perception of angles and proportions in a non-drawing context both contributed to drawing ability, and also related to one another (Chamberlain, McManus, Riley, Rankin & Brunswick, 2012). However, some researchers (e.g. Lawton, 2011; Livingstone, Rosen, Drislane, & Galaburda, 1991) have argued that difficulties with figure-ground discrimination and pattern analysis represent a core deficit in dyslexia resulting from faulty timing of cells within the visual system. The spatial and temporal sequencing problems caused by this faulty timing impact on both the individual's reading and drawing ability.

In order to elucidate the causal relationship between perceptual abilities and drawing ability in dyslexic students, it was necessary to explore whether the implementation of a structured teaching programme focused upon these faculties would improve drawing ability. It is argued that greater figure-ground independency can be established by teaching techniques that encourage the awareness of concepts such as negative spaces and contrast boundaries, and that the judgement of simple angular and proportional relations can be improved by relating salient points of the primary geometry (the relationships between edges, corners and surfaces in the perceived world) of the subject-matter to the secondary geometry (the relationships between points, lines and tones on a drawing's surface) of the drawing itself. A qualitative pilot study was conducted within a series of drawing workshops at the RCA, utilising teaching strategies pertaining to these perceptual faculties, to assess the potential impact on perceptual processing and drawing ability. Results from both the quantitative and qualitative studies were presented in the form of a video at the *Thinking Through Drawing* conference, Wimbledon, 2012 with a view to marrying up practical teaching strategies with the growing body of psychological evidence for perceptual enhancement in drawing.

AN EIGHT-STEP STRATEGY FOR TEACHING DRAWING

The body of this paper is a transcript of the video made over the three days of drawing workshops.

The video begins with a proposal for a strategy for teaching drawing:

1. To focus attention upon the subject matter and the relationship with the surroundings (figure/field relations). This entails making decisions about format: portrait or landscape.
2. To construct a general structure, or scaffolding, in terms of relating the main axes of the drawing paper to the main axes of the subject-matter, using, for example in life-drawing, the 'invisible N-grid' of lines running across the figure that connect salient points such as Nose, Nipples, Navel, kNees, and kNuckles. These axes might be the means by which students hone their skills of accuracy in drawing angles and lengths in proportion so that the repetitive, low-level exercise is perceived to have contextual meaning for the student.

3. To introduce visual concepts such as ‘contrast boundary’ in place of the common term ‘outline’. This immediately engages the student with the variety to tonal values across the whole subject matter and, in particular, allows the student to notice how the contrast boundary fluctuates at the edges between figure and field. The concept of ‘negative space’ (spaces between those items in the visual field normally labelled with language), can also aid students to look without language, to apply specifically non-verbal methods in the process of drawing.
4. To repeat these first three steps at the beginning of every new drawing.
5. To discuss with the tutor the process under way on the drawing board.
6. To repeat the instructor’s strategy with support from the tutor.
7. To draw independently at unsupervised open-access sessions.
8. To re-demonstrate the practices and strategies offered by the tutor in order to reinforce them.

The eight-step structure is based upon research by Nist and Mealey (1991) into strategies for teaching dyslexic students, strategies which have not been applied in the teaching of drawing before, but which make use of insights well known to teachers of drawing; for example, those applied by Betty Edwards in her well-known book *Drawing on the Right Side of the Brain* (1979), updated in 2012.

What follows is an edited transcript of the interviews conducted before and after the drawing exercises. Five students were interviewed, each from a different department of the RCA. All participating students were studying at post-graduate level, all have spent a minimum of four years at art school prior to enrolling at the RCA, and all are either dyslexic or dyspraxic. In order to protect the students’ identities their names are not included; however each student is described by their studio practice.

TRANSCRIPT OF INTERVIEWS

Fashion student interviewed before workshops:

My drawing is a bit insecure it’s not as beautiful as it is in my head I struggle with knowing how to get the proportions right on the sheet of paper.

Fashion student interviewed after the workshops:

I think what we have been talking about contrasts and spaces and just paying attention to other things rather than stressing about how to get the object on the paper has really helped. So you start approaching it from a different position you start approaching it from behind in a way. You focus on different things and by focusing on different things the object appears more effortlessly on the paper and if you just follow the guidelines then it appears to look right. This approach adds some more playfulness and relaxes the hand as well. So the hand is not so cramped you get some movement and playfulness and that's what brings the drawings alive.

Ceramics student before:

I think drawing for me is a lot to do with fear. I tend to go over lines to make sure they are right then I rub out and re-draw. It's not as free flowing as I wish it to be. Just to get ideas on paper and then move forward is an issue for me.

Ceramics student after:

The issue of space and primary and secondary geometry and all of the different things that Howard has been mentioning I naturally wouldn't be inclined to think about. Before I'd just get lucky with proportion and if not, I just kind of try and compensate somehow but now I'm adjusting myself and planning out before hand. Having a bit of structure helps me focus and gives me a system to use. In terms of proportion I should have made the first picture as a portrait and I can see that now instead of squishing it all in. I also went straight into surface detail rather than getting all the basic shapes into the scene and I feel like now I'm aware of the negative spaces that you mentioned and also of how things relate to each other. Another thing I would never have considered before is trying to create a horizon and relating the objects to that. I always used to leave things isolated, floating in space.

Product design student before:

I can't control the shape of the object and also I don't know how to control the connections of how the shapes relate to each other, and also I'm not good on construction.

Product design student after:

First of all I got more confidence. I learnt a lot to think about the relationships between objects; also I'm thinking more about the marks I'm making in space which I never thought about before.

Design Engineering student before:

I generally try to avoid it. I imagine my idea and then work quite a lot in 3D so I go straight from my head into making and really skip the whole drawing bit. My sketchbook doesn't have any sketches in it, it's full of schematic drawings it's nice to see how things evolve through drawing because I don't really get that. I think sometimes that doesn't come across very well to my tutors the fact that I have been designing and refining my idea quite a lot, because there isn't really anything for them to see. Also it's tricky if you're working for clients they can't see how stuff is moving on and changing because it doesn't come out very well when I try and draw it. I tend to draw things in a more technical drawing style.

Design Engineering student after:

I'm just far more confident now and I seem to have better co-ordination between looking and drawing, from moving from what I see onto the page. It feels more fluid.

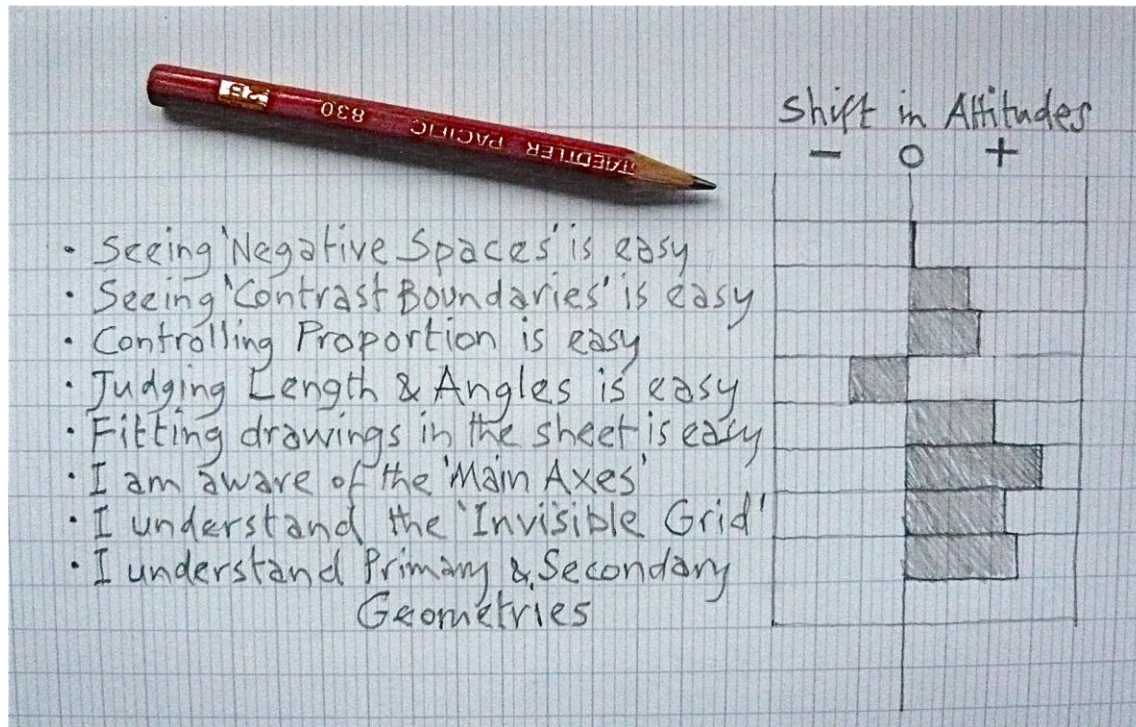
Vehicle design student before:

It's drawing my ideas that I really struggle with. If I'm drawing an object I can generally get a reasonable accuracy with the shape but it's when I'm trying to draw an idea I'm too focused on the design of it instead of sketching the whole thing, so the proportion and scale are wrong because I can't replicate what I'm thinking.

Vehicle design student after:

It's helped me to quantify a process whereas before because I didn't understand what I was doing and my drawing could be very erratic. Often I feel I rush my drawings and don't really consider proportion, which is a big issue that I have.

SUMMING UP BY HOWARD RILEY, DRAWING TUTOR:



Questionnaires probing students' attitudes towards technical aspects of drawing ability were completed before and after the workshops. Although the group was small some useful indications emerged which will inform future research plans. For example all students recognised the high value of perceiving negative spaces even before the workshops, hence little change in their attitude towards that aspect of tuition. Shifts in attitudes towards other technical aspects introduced, such as the concept of contrast boundaries, the awareness of the main axes, their relation to format choices and, the relationship between primary geometry (relations between edges and surfaces in 3-D space) and secondary geometry (relations between points, lines and shapes on the 2-D drawing surface), were all strongly positive.

One intriguing outcome was the apparent contradiction between the group's positive shift in attitude towards the ease of controlling proportion as opposed to the negative attitudinal shift concerning their ability to judge lengths and angles. Heightened awareness of the

crucial importance of judging length and angle may well have increased their cautiousness in responding positively to this aspect of the tuition.

Finally we're pleased to report that every student involved considered their drawing ability had been improved by participation in the workshops.

DISCUSSION

The main themes emerging from these interviews reflect the importance of providing a framework to focus the students' drawing, and to help them to see how the edges and surfaces of objects fit together in space. Having this clear structure then gives students confidence in the drawing process, essentially the transformation of primary geometry into points, lines, shapes, tones and textures of the drawing itself, which helps them to relax so that their drawing becomes more fluid and effortless. (The complexities of colour were omitted from these exercises.) On the basis of the majority of categories of drawing abilities, students saw an improvement. Although students appeared to perceive the judging of angles and lengths to be harder after the drawing course, we can suggest that this is a result of their enhanced appreciation of the task of breaking down the visual scene and to accurately depict the subcomponents. The course has provided them with the tools to achieve this, although undoubtedly their improvement in the future will be very much dependent on their willingness to engage with these tools during their drawing practice. The group dynamic throughout the workshops was a very positive and mutually-supportive one, which encouraged each participant to experiment with the visual strategies introduced.

Future work by our research group will explore in greater depth the relationship between specific skills that are key to mastery of observational drawing ability in dyslexic and dyspraxic art students. Additionally, we will further refine our evidence-based teaching strategy to help such students learn these skills in small, tailor-made workshops with the intention of improving their drawing ability whilst at art school.

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