Diagramming wrongly: bridging theory and practice with 'indisciplined' diagramming

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Abstract

This paper offers an overview of our recent pedagogic action-research that explores Art and Design students' use of diagramming, to develop their contextual and critical understanding. In so doing it considers the often difficult relationship between 'theory' and 'practice' as experienced by students. We argue that student diagramming can provide a productive bridge between theory and practice and between 'read/write' and visually orientated modes of learning. We conclude that our students' frequent misapplication of certain key forms of diagramming often provide a productive 'first gesture' into their developing insights. Hence such notional 'mistakes' should be actively encouraged rather than corrected.

Key words: Diagramming, Indisciplinarity, Art and Design, Theory and Practice, First gestures.

Some context

At the University of Brighton's Pedagogic Research Conference in 2018 we gave a presentation entitled 'Figuring out and thinking through diagrams: Art and Design student and staff uses of diagrammatic forms to explore and explain ideas'. That presentation offered a synopsis of our recent action-research exploring uses of diagramming in higher education Art and Design.

Our action-research was premised on a speculation that diagrammatic practices offer invaluable means for students to question, think through, evaluate and develop their understanding of key concepts and processes, in order to 'figure out' their own and others' ideas and understanding. Thus, our core aim has been to develop students' use of diagrammatic forms to help them organise, explain and explore their ideas, to both themselves and others, creating diagrams *of* and *for* thought.

This paper speculates further on some of the concluding observations in that presentation, though in so doing it inevitably needs to recap aspects of the process that led to those observations. The presentation was structured around a Prezi, viewable here: https://prezi.com/jtth-xbbtl-x/figuring-out-and-thinking-through-diagrams-art-and-design-s/?webgl=0), which includes fuller details of the action-research process, and many examples of student work made in response to the diagramming tasks illustrated in the presentation.

Theory, practice and the space between

At Northbrook Metropolitan College we mostly work with undergraduate Art and Design students on a range of practice-orientated FdA and BA(Hons) programmes. These students dominantly self-identify as visual practitioners, and making images is core to their practices across a range of media forms, including illustration, graphic design, communication design, photography, film and video, painting and drawing. A relatively high percentage of these students are in receipt of the Disabled Students Allowance, most frequently following a diagnosis of dyslexia.

We work with these students across practice and theory, and have a particular interest to develop their capacities to positively integrate and apply theory and practice, though systemic institutional requirements of staffing, timetabling, departmental and course structures can work against this aim.

In so doing we seek to develop 'a thinking of the doing and a doing of the thinking', wherein practice is theorised and theory is practiced. A praxis.

However, there is a well-documented pedagogic issue associated with this aim. Theory is frequently experienced by students in the form of the spoken and written word, in the lecture, the book or journal article, the assessed essay and so on. Some art students express a keen aversion to such text-based 'read/write' learning, and may then come to situate it in contrast or even opposition to their identification as visual makers who 'see/ picture'. In extreme cases their personal educational histories have colluded to reinforce a crude binary that declares 'good at art' = 'bad at reading/writing'. In post-compulsory education, such entrenched conceptions may then lead to the perpetuation of well-learned practices of resistance, acquired through many years of compulsory 'read/write' and exam orientated schooling. The well-meaning but reductive application of 'learning styles' to or by students can readily further embed over-determined self-definitions, effectively giving students 'permission' to not engage with certain forms of learning. Evidence for this is seen in a spectrum of resistance, from marginal doodling (picturing as distraction from the boredom of note-making) to the wholesale refusal to read and engage with 'texts' or articulate arguments and ideas in a theorised context per se. Such resistance is often underpinned by the student's profound sense of previous 'academic failure', and hence is in part a learned defensive strategy to avoid further potential humiliation. This self-reinforcing vicious circle of resistance to, and disengagement from, a crucial 'critical/reflective' realm of higher education, inevitably impacts negatively on the student's learning experience as a whole.

Given these concerns, we are always interested to develop productive and meaningful ways to engage students in critical, theoretical ideas that inform and integrate with

their visual practice. In fact, those ideas are indivisible from a critical, creative practice. But nonetheless, the programmes on which we teach do separate 'studio practice' from 'contextual studies' to greater or lesser extents in their modular design. In so doing, the assessment of critical, theoretical, historical and contextual knowledge and understanding requires students to submit work in written forms such as the blog, the essay, the report and the dissertation. However, we contend that there is much merit in this read/write requirement, providing it is in the context of a balanced 'diet' of assessment forms that do not unfairly disadvantage students with read/write weaknesses. Evidently those weaknesses need to be worked on in order to improve them, rather than merely accommodated.
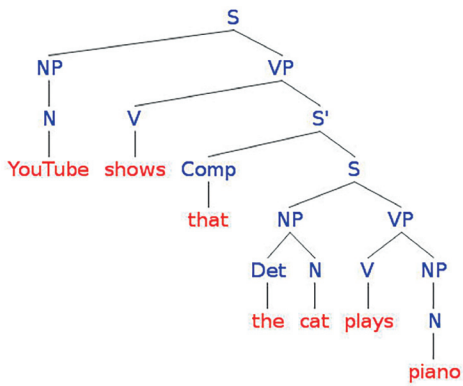
Why diagram?

In this context, we often seek to bridge 'read/write' and 'see/picture' learning modes in our pedagogic practices. We encourage students to graphically note-take, to illustrate their writing and to caption and annotate their imaging. Working with students to develop their diagramming practices was an obvious next step in this bridging. And whilst diagrams are frequently used in teaching to visually explain key concepts, here it is the verb rather than the noun form that is emphasised - student diagramming needs to be an active, creative practice.

   Educationally key processes and concepts are often developed and communicated in the form of diagrams, and many disciplinary areas draw on specific 'standardised' diagrammatic forms, which students of those disciplines are required to learn and apply.
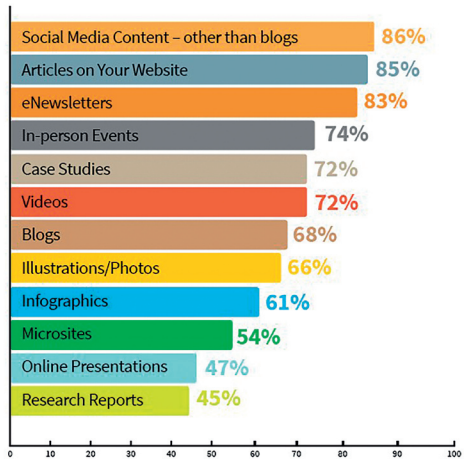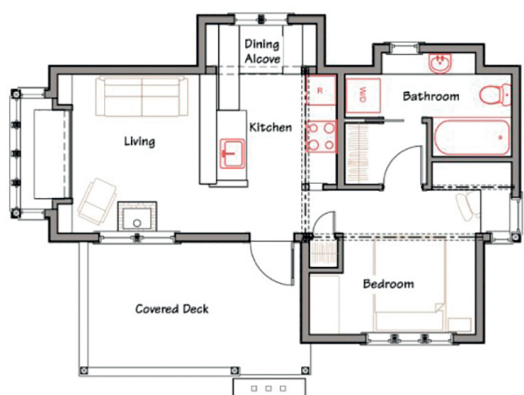
Consider:
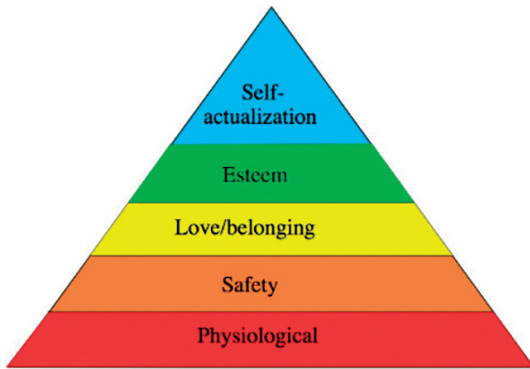

The geographer's map

The linguist's syntax tree

Australian Content Marketing Tactic Usage

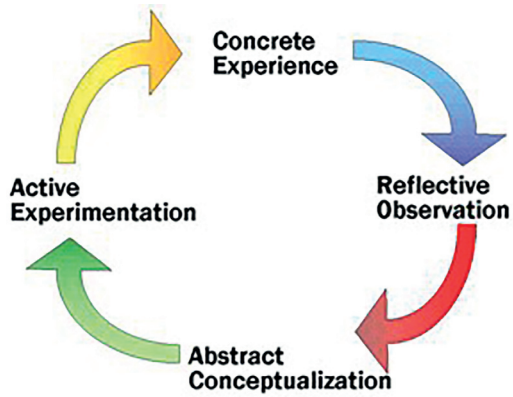|	%
Social Media Content – other than blogs	86%
Articles on Your Website	85%
eNewsletters	83%
In-person Events	74%
Case Studies	72%
Videos	72%
Blogs	68%
Illustrations/Photos	66%
Infographics	61%
Microsites	54%
Online Presentations	47%
Research Reports	45%

The marketeer's bar chart
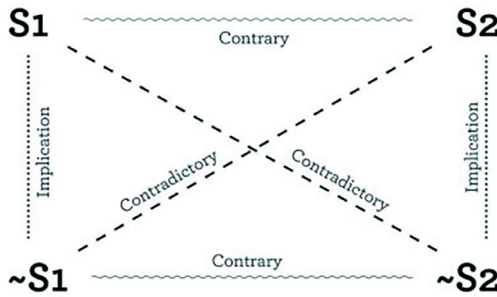

The architect's plan

The psychologist's hierarchy

The educationalist's cycle
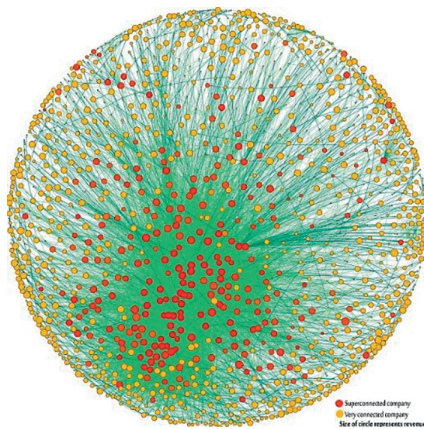
The economist's global network

$$\bar{\psi}(x') \qquad\qquad \psi(x')$$

$$ie\gamma^\nu$$

$$A_\mu(x)A_\nu(x')$$

$$ie\gamma^\mu$$

$$\bar{\psi}(x) \qquad\qquad \psi(x)$$

The physicist's diagram

S1 —— Contrary —— S2

Implication ⋮ ⋮ Implication

Contradictory Contradictory

~S1 —— Contrary —— ~S2
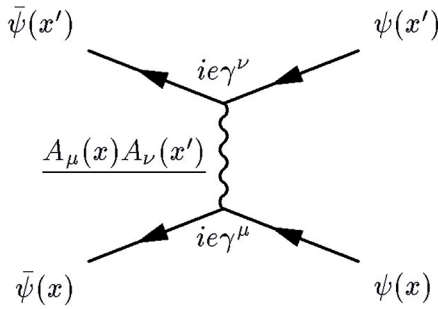
The semiotician's square

You may note in this list the absence of a type of artist's diagram (excepting colour charts perhaps), the predominance of representation as an invariant feature of fine art practice privileges the pictorial above the schematic. Therefore, apart from a few significant exceptions, the use of the diagram in art is relegated to individual artist's oeuvres in art history, for example, Paul Klee, Marcel Duchamp etc. In recent times however, the discourse of the diagram in art has opened up in the field of 'artistic research', with artists such as Michael Whittle (2014), Matthew Ritchie (2017) and Nikolaus Gansterer (2017) exemplifying this practice. What is worth noting in these examples, is that these artists' use of diagrammatic forms do not conform to existing disciplinary standards. They take from a multitude of disciplinary fields, and they creatively mix up forms across these disciplines. In this sense, they are 'indisciplined' (Citton, 2012) in their approaches.

With such 'indisciplined' approaches in mind, diagramming became central to our action-research with students, as it is a to-hand form that bridges image and text, allowing multi-modal processes of thinking to develop in ways that writing alone does not. Through experimental and creative application, it may enable the bringing into understanding of new insight. In its bridging of verb and noun, from process to outcome, diagramming also enables 'reflection in action' (Schön, 1983). And here the bridge metaphor also shifts from noun to verb, indicating a movement between, rather than a structure of connection. In this sense 'process' itself does the work of bridging conception and outcome. And importantly, diagramming functions as both the process by which we might explore and work out ideas, and as the explicatory outcome that communicates those worked out ideas to others, a mode that lets us figure out things for ourselves (and with others), and then enables us to explain those ideas to others (and ourselves).

Digressing slightly, it is worth recalling that Schön was an accomplished jazz and chamber musician adept at improvisation. His keen practical awareness of this skill informed his academic writing, most notably in his exploration of how professionals are able to 'think on their feet'. He coined the phrase 'artful doing' to explain his notion of reflection in action, comparing it to the ways an artist might make a sequence of moves, whilst regularly pausing to reflect on and assess those steps, thereby adding to, correcting and developing their practice in action.

> 'In each instance, the practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behavior. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation'. (Schön, 1983, p. 68).

Schön's description of an artist's creative process identifies 'surprise, puzzlement or confusion in a situation which he (sic) finds uncertain or unique', as key requirements in the move to generate understanding and change. In Art and Design practice these experiences are well understood as foundational to the creative process, and there is an extensive artists' literature which advocates for them in the studio/creative context (for example, Fisher and Fortnum, 2013; Iversen, 2010). Even in the institutionally constrained realm of art pedagogy, where the metrics of assessment, achievement and award seek to dictate the measurement of 'learning outcomes', there is a recognition that students need to be offered opportunities to embrace uncertainty in and through their practice, to take risks, to fail, to make mistakes and to learn by them. Running against the grain of the prevalent 'managerialist' quantification of higher education 'outcomes', arguably exemplified in the University of Brighton's recent Curriculum Design Initiative and its imposition of an over-arching regulatory framework. There is a well-established, teacher/practitioner-based approach to art and design pedagogy which resists adherence to prescribed 'learning outcomes' in favour of this playful, purposeful exploration of the unknown.

However, these approaches tend to be more at home in the studio than the study. Thus, in the visual see/picture realm of creative art practice, a student's unknowing/uncertainty may be understood by both themselves and their teacher as an opportunity, an opening onto creativity. But in the realm of the text read/write such student unknowing is often understood and experienced as ignorance, a knowledge deficit in need of remedy. And so, we come full-circle to some students' resistance to that read/write realm and the significance of diagramming to bridge that gap.
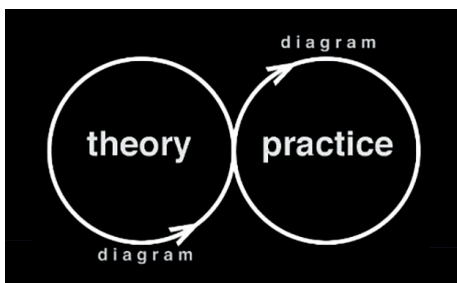
Action research with students in Art and Design: diagramming workshops

So, bearing in mind Schön's sense of 'artful doing', we were interested to develop an 'indisciplined' and open approach to diagramming with students, premised on the introduction and application of a key set of ubiquitous diagrammatic forms. Importantly the generic forms chosen already operate across disciplines in different and sometimes productively unexpected ways.

The Venn diagram is a good case in point. Its origins are in Set Theory where it has been used to clearly group well defined mathematical objects. But it is now ubiquitously used in many subjects to indicate 'vague' (i.e. non-mathematical, non-logic based) similarities and differences premised on loose 'semantic' groupings. Whilst this vagueness may be anathema to Set theorists, it may still enable genuine insight (and humour) in visually establishing previously un-pictured and un-thought relationships.

In synopsis we designed an adaptable, PowerPoint-led workshop input for use with various groups of students across visual art/design disciplines, introducing them to the use of Mind Maps, Concept Maps, Venn Diagrams and Timelines. These key forms were contextualised and their application explained, and students were then asked to apply those forms in specific contexts. With several of the groups the context was the pursuit of essay writing or dissertation development, where our students often struggle to organise, structure and articulate their ideas. In these workshop sessions, each student was given an A3 'pack' of the PowerPoint slides, with embedded diagramming tasks and blank pages on which to respond (opposite).
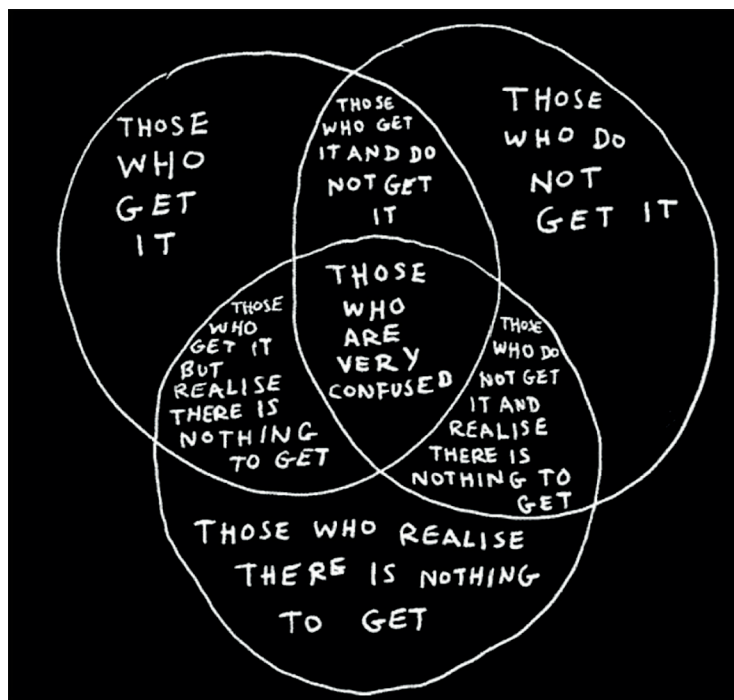
'Those who are very confused' by David Shrigley
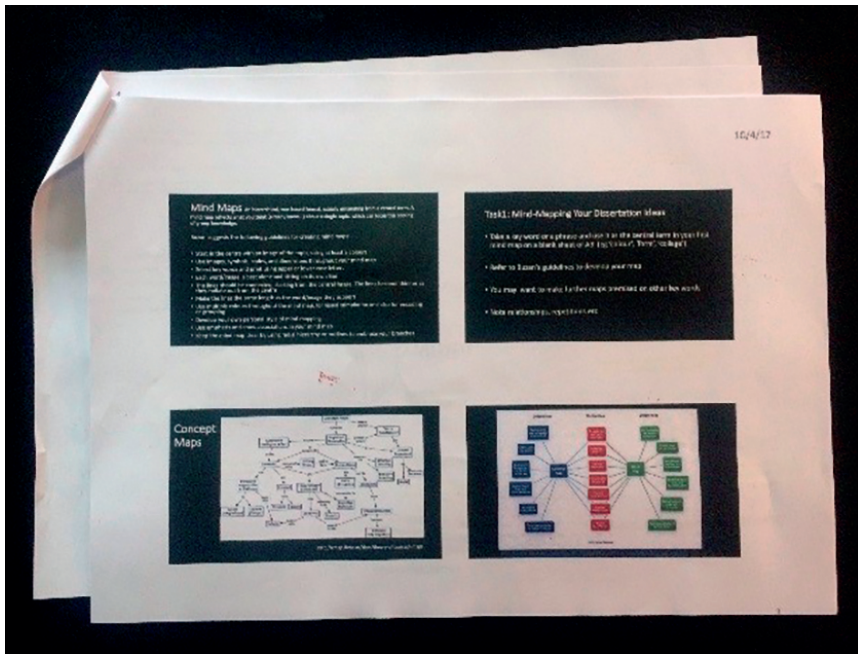
Page 2 of A3 workshop diagramming pack

*Detail of page 2, mind mapping task slide*

At the end of each session this material was gathered in, photocopied and returned to the students for them to take away and develop further. The copied packs then provided a 'data' archive for us to reflect upon. In some instances, students were asked to write short evaluations, commenting on their experience and the value of diagramming ideas in these ways. In other instances, follow up tasks required students to post their diagramming responses on blogs, along with additional reflection and commentary.
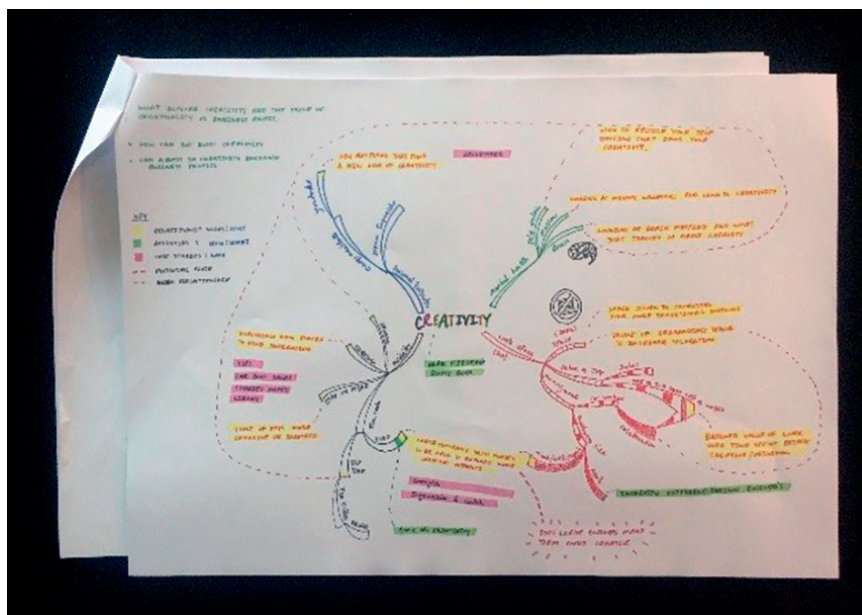
(Initially blank) page 3 of diagramming pack, with student's diagrammatic response to mind mapping task

## Overview of student responses to, and feedback on, workshop tasks

Overall, students were predominantly positive and enthusiastic about the merit of using these diagrammatic practices to think through their initial ideas, especially the mind mapping. Many commented on how the process enabled them to gather their thoughts, sift through and make connections between ideas whilst consolidating their knowledge of a given field of enquiry. Developmentally mind-mapping their ideas and knowledge, with an increasing focus on key words, was often commented upon as particularly productive and useful. Subsequently looking over examples of these mind maps also gave us, as future supervisors of the projects being initiated in this context, a very useful insight into students' levels of understanding and knowledge of their specialist field. When produced alone, mind maps tend to enable the 'getting down on paper' of the already known (or assumed), and whilst they also enable the making of connections and relationships between 'facts', they importantly serve as useful markers of existing knowledge. Students were subsequently asked to bring these maps to early stage supervision tutorials, which enabled us to helpfully comment on 'knowledge gaps' and to point students to relevant sources to plug those gaps.

The PGCE student's commentary on his mind map (bottom right of image opposite), astutely notes that the form is helpful in 'identifying what I know, and more importantly, what I don't know'.

Whilst mind maps were nearly always positively endorsed in student feedback, Venn diagrams received a much more mixed response. In part, this may well have been a consequence of us asking students to take comparative elements from their mind maps in order to develop Venns, and in so doing relegating Venns to a sub-set of those mind-maps. However, where students were already clearly working with comparative elements

*Design student's mind map of initial
ideas for dissertation*
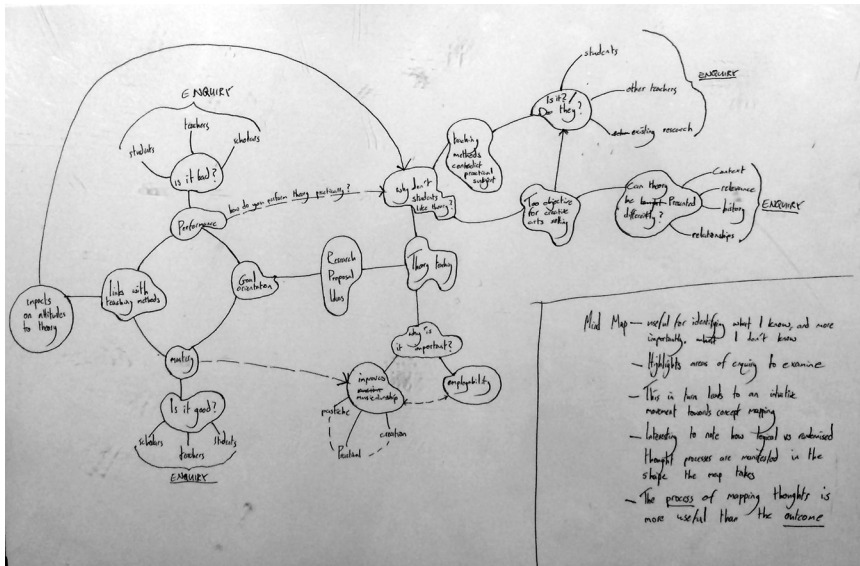
*PGCE student's mind map of initial
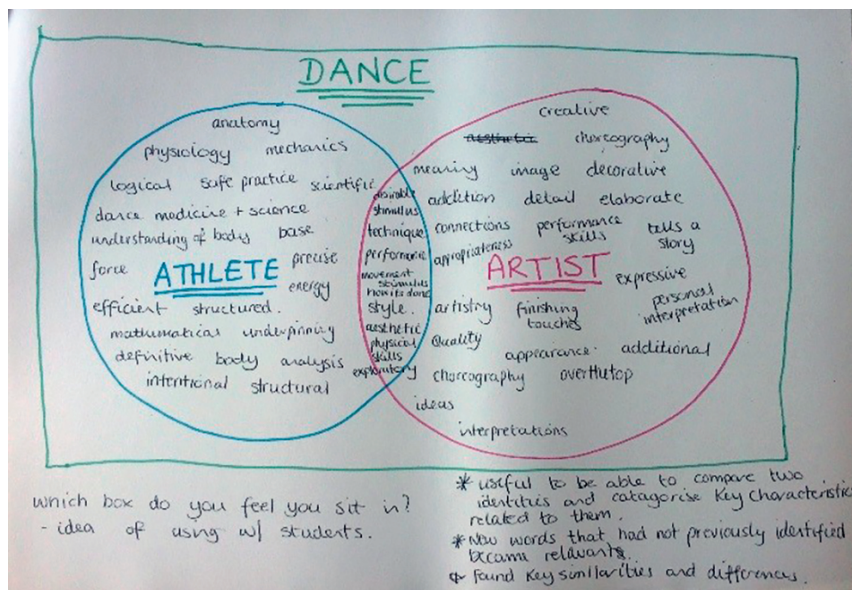ideas for action-research project*

in their mind maps, they were readily able to productively design Venn diagrams to
further explore relational similarities and differences between these elements. In one
instance the group were focused on diagramming ideas for a comparative essay, and
here they very successfully drew Venn diagrams to explore similarities and differences
as seen over.
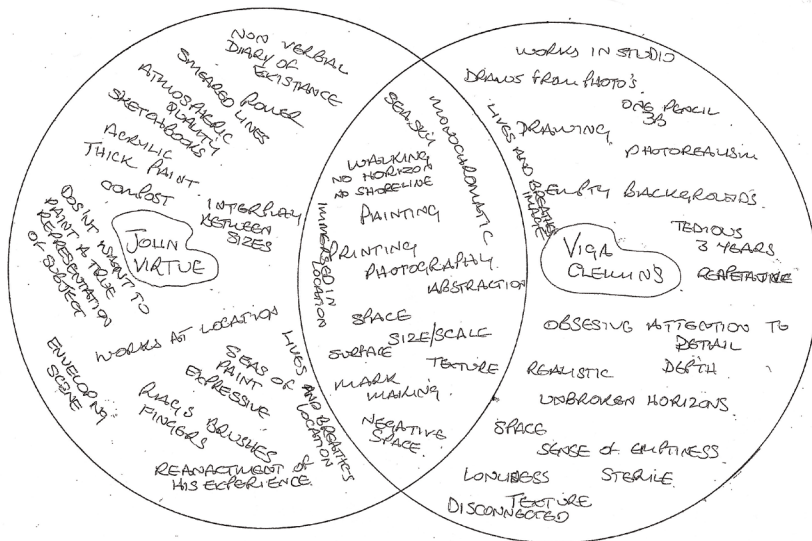
BA Fine Art student's Venn diagram ideas for comparative essay

PGCE student's Venn diagram exploring elements
of her proposed action-research project

Likewise, in the above example, a PGCE student specialising in dance comments on her Venn (bottom right of image) that it has helped her categorise characteristics and identify key similarities and differences. Interestingly she has also noted that she could use this diagrammatic form as a research tool with her own student research subjects, asking them where they might position themselves in the binary structure.
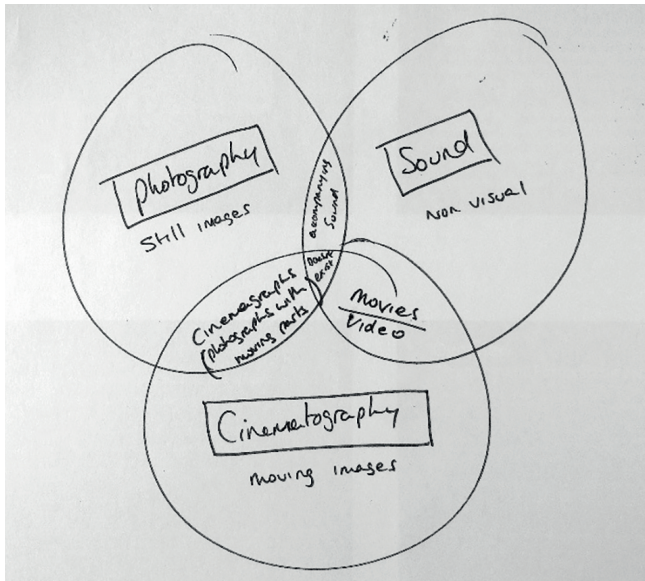
***Design student's 'dissertation ideas' Venn diagram,
exploring overlaps of sound, still and moving images***

As with mind maps, some Venn diagrams also helped students (and future supervisors) to identify knowledge gaps.

In the above example the student's assumption that the central zone of overlap between photography, cinema and sound 'doesn't exist' might be productively challenged, Chris Marker's 'La Jetée' immediately comes to mind, along with Ken Burns.

And, so what?

However, whilst students generally expressed enthusiasm about these diagramming tasks, and frequently commented on the positive value of these forms in relation to the development of their research projects, this should perhaps come as no surprise. Diagramming as a means to gather, organise and structure content ahead of essay and dissertation writing is a well-established, if all too often neglected, practice.

There exists a multitude of educational resources promoting the use of diagramming to school, further education and higher education students, some of which advocate similar approaches to those we have drawn upon. In fact, our PowerPoint-led student workshop sessions made explicit reference to the self-annointed Mind Map™ guru Tony Buzan, who has written dozens and sold millions of books on the subject. So, nothing new?

Well perhaps. Firstly, it is worth pointing out that very many of the readily available digital resources for diagramming offer highly prescriptive, rigid formats that narrowly structure the ways in which students can use graphical/diagrammatic forms. To generalise, they tend to provide pre-determined frameworks into which students are required to enter (descriptive) content in the form of words. See for instance Education Place (https://www.eduplace.com/graphicorganizer/) or Inspiration®Inc, 'The Leader in Visual Thinking and Learning (http://www.inspiration.com/visual-learning). These models are premised on a very reductive understanding of education as 'information retention',

undoubtedly highly appropriate to the requirements of many areas of the National Curriculum and their examination at GCSE and A-level. Often these materials are explicitly designed to enable student 'mastery' of subject matter, with graphic organisers epitomising this approach:

> 'By using graphic organisers across all subject areas, you will be empowering your students to master subject-matter faster and more efficiently'. TeacherVision® website. Available at: https://www.teachervision.com/lesson-planning/graphic-organizer.

Interestingly both Buzan's many books, most of which pre-date digital forms of diagramming, and his website advocate an analogue approach to mind mapping, citing its material simplicity and to-hand-ness as positive features. Nonetheless, his trade-marked format is relatively prescribed, and is monetarised in a digital iMindMap app which rigidly adheres to the Buzan prescription, preventing users from doing anything other than making a formulaic Buzan-style mind map. We contend that this rigid and digitally constrained use of 'given' diagrammatic forms works against our aim to enable creative indisciplinarity in students' diagramming.

So, with an awareness of these prescribed forms, we were very keen to provide students with little more than a blank sheet of A3 paper, coloured pens, and a general overview of how they might proceed to diagram their ideas using different formats. Indeed, it is notable that some enthused students, who were subsequently asked to post their diagramming efforts on their research blogs, went on to explore the use of digital mind mapping software, and in every instance these digital diagrams dramatically changed in quality as they became bound by the structures and strictures of that software. Somehow, the personality of the creator vanished in this process, along with the idiosyncrasies of their understanding of diagrammatic forms.

Which brings us to our second point. One striking aspect of our action research project was the extent to which we over-estimated students' existing understanding of what we took to be ubiquitous diagrammatic forms. Whilst most students told us that they had previously used versions of mind mapping, and were aware of Venn diagrams, in practice many were unaware of the conventions of application, and found it quite demanding to 'accurately' apply our accounts of these forms to their diagramming tasks in the development of their ideas. They also often commented that they wished they'd been introduced to these forms and their uses earlier on in their courses.

On recognising this 'weakness' early on in our workshop sessions, we then spent more time with students in subsequent sessions outlining how these diagrammatic forms worked. However, in retrospect we now sense that this may not have been time particularly well spent …

Diagramming wrongly

In reviewing the 'data' generated by students in our workshop sessions we have looked over hundreds of their diagrams, read their feedback and talked with many about their experiences. In very many instances those diagrams are not entirely 'correct'. They include misunderstandings about the form, over-stated assumptions, inaccurate/irrelevant 'content' and misapplication of structuring elements. In some instances, students have appended their diagrams with questions or critical commentary.
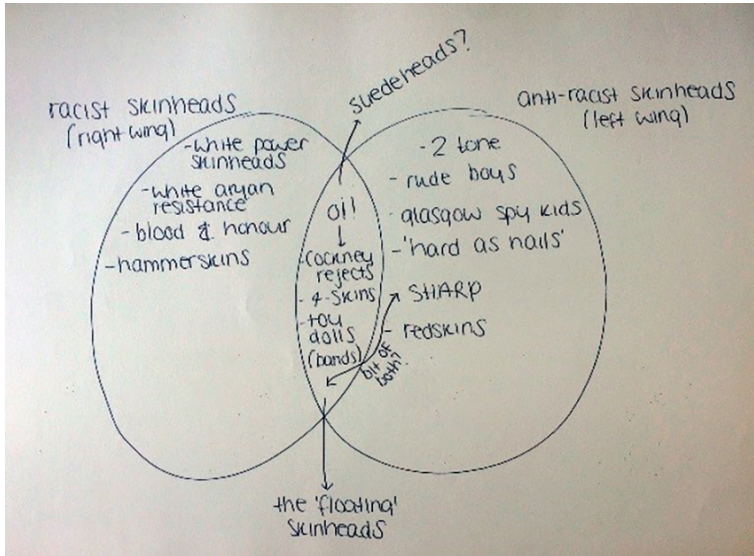
Student's Venn diagram exploring essay ideas, with arrows
and question marks indicating uncertainties

In a number of instances, they have creatively, and perhaps unwittingly, fused forms to create hybrid diagrams that contain elements of mind maps, concept maps and Venn diagrams all in one.
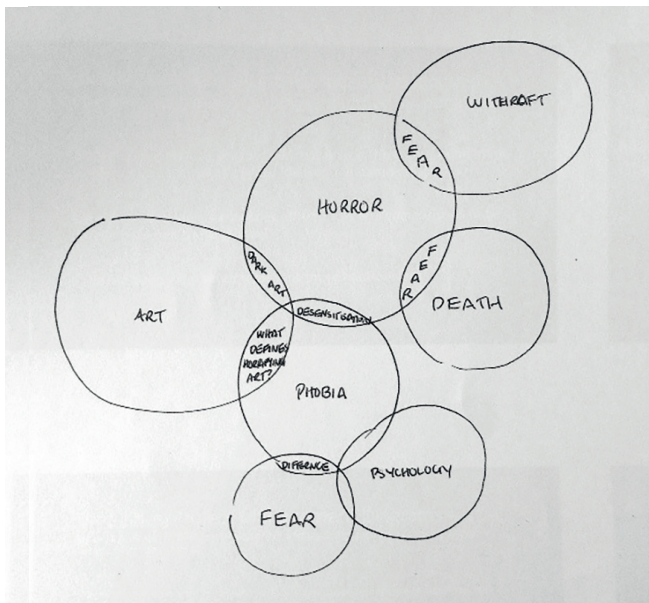
Student's hybrid mind map/Venn exploring essay ideas

Nonetheless, this 'indisciplined' approach to diagramming often resulted in the students gaining real insights and 'moving forward' in their thinking, especially where they returned to rework initial diagrams.

O'Sullivan (2016), writing on the diagramming practices of artist Karin Schneider notes that:

> 'The diagram here is a strategy of experimentation that scrambles narrative, figuration - the givens - and allows something else, at last, to step forward. This is the production of the unknown from within the known, the unseen from within the seen. The diagram, we might say, is a strategy for sidestepping intention from within intention; it involves the production of something that then 'speaks back' to its progenitor'. (p. 17).

In this sense our students' diagrammatic mistakes, misconceptions and hybridisation of forms become an opening onto their unknowns, and at the same time a vehicle from which to reflect on them. O'Sulilvan goes on to speculate that;

> 'A diagram, especially as drawing, often leads ahead of conceptual thought. It operates as a probe prior to any consistency (this, we might say, is the diagram as sketch). The diagram can also move at a different speed from, for example, writing, and as such can achieve an escape velocity from the purely textual (this, we might say, is the diagram as automatic writing). The speed of the hand (or intelligence of the body) can outrun the cogito (or, more simply, the diagram is of the unconscious, however the latter is figured) ... Such a practice - manipulating concepts as if on a tabletop - might, again, allow for hitherto 'illegal' connections and syntheses to be made'. (p. 21).

Importantly O'Sullivan also argues that these 'illegal' connections and syntheses' are always open to revision. They are starting points to be returned to, developed further and mutated anew both during and after the event of their initial making.

Interestingly we also identify with this approach in our own attempts at 'explicatory' diagramming, as teachers in front of students. There have been plenty of occasions when we have sought to visualise and 'explain' a concept under discussion with students by using 'ad hoc', 'improvised' white board diagrams. All too often they don't at first 'work', though they serve as placeholders or 'first gestures', to be developed, re-thought, partially erased and re-drawn, often in conjunction with those students, until a mutual coherence and understanding emerges. Such revisions, with or by students, may enable a rethinking of assumed categories and content, and a re-working of diagrammatic forms in order to arrive at genuine new insight. Hence, we should not be dismissive of diagrams that appear to 'not work'. They are often the necessary 'first gesture' which will help us move on. Their 'wrong-ness' merely warrants reflection and possible re-configuration.

Moving on

In conclusion, and looking forward to future diagramming with students, we now suggest that we need not spend more time ensuring that the conventions of given diagrammatic forms are fully understood before encouraging students to creatively apply those approaches. Rather, that time might be better spent in reflective discussion and further development of those 'wrongly diagrammed' first gestures.

This aim aligns closely with Dean Kenning (2014) and his advocacy of Social Body Mind Maps (SBMM), described as diagrammatic leaning tools which:

> '... enable critical reflection on previous or current creative practice, with a view to future work. Students draw a 'map', which begins with an image of an artwork or part of an artwork (sculpture, drawing, film, etc.) that they have made, are making, or are thinking about making'. (p. 3).

Like us, Kenning conceives of these student generated maps as key means for them to materialise an understanding of the context of their art practice. But rather than starting with a theoretical/contextual issue in the form of essay title or research project idea, Kenning asks students to begin their diagramming with their own artwork, and to work out from that to develop an understanding of its context. In this sense Kenning's starting point is the studio, where many students feel 'at home', whilst we are beginning in the study, where we may have to lead them. And for Kenning as for us, there are no 'wrong' diagrams:

> 'As the SBMM is a heuristic tool to generate reflection through production, and vice versa, there can be no 'wrong' or 'bad' maps, only maps that are more or less engaged, more or less developed. Talking through ideas with a student as they are drawing their maps, encouraging interesting pathways, and referring their specific linkages to concrete determining forces, enables more confidence in 'letting go', letting the diagrammatic machine they are constructing 'think' for them'. (p. 6).

Like us, he is also critical of current assessment culture, which he argues directly mitigates against Schön's notion of 'reflection in action'/'artful doing', as it compels teachers to measure student 'performance' against predetermined 'learning objectives'. In this reductive model, creative enquiry and exploration swiftly stagnate into a prescribed sequence of learnable and readily achievable steps to success. Presentation comes to be rewarded over exploration, and reflection is always post hoc, merely a matter of demonstrable confirmation to show how those learning outcomes have been achieved.

By contrast, both Kenning's SBMMs and our students' wrongly drawn diagrams, fail to provide assessable confirmative evidence of assimilated knowledge or universally applicable solutions, though it may be argued that they do offer students a degree of agency in creatively visualising their understanding of issues, ideas and practices bearing upon them as they negotiate and move through the unknown.

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