The 2012 Thinking through Drawing symposium Drawing in STEAM was held at Wimbledon College of Art on the 12th to 14th September, in association with Loughborough University and Teachers College, Columbia University.

This book compiles drawings made during the event in response to the presentations and workshops.
Thinking Through Drawing Seminar 2012 -
Drawing in STEAM
Held at the Wimbeldon College of Art,
12th to 14th of September 2012

Contents
Yoon Bahk – Notes on Scribing 1
Shaun Belcher and Moogee the Art Dog at Thinking
Through Drawing 2012 16
Sarah Blake: Artist’s Statement 31
Robert Shadbolt 45
The Symposium 54
How is drawing used within and between STEM disciplines (science, technology, engineering and maths)? What is the relationship between drawing practices in the Arts and in STEM subjects? What is our current understanding of drawing, cognition and learning, and how is it contributing to curriculum development in instructional design in these areas? These were the questions posed at the 2012 symposium, Thinking through Drawing 2012: Drawing in STEAM, in October 2012.

These drawings are the result of four artists attending the symposium, they respond to presentations given addressing the role of drawing practice in STEM disciplines, our growing understanding of drawing and cognition, and the potential for pedagogic and curriculum development. Certain themes emerged, such as the use of drawing in medicinal contexts, both as an aid in surgical training, and as an aid to recovery and personal understanding of illness. The use of drawing as a tool for thinking and visualisation was also a strong theme, with presentations addressing this from numerous disciplinary perspectives. We saw that a drawing can be used as proof, and that it can (literally) make us more capable of learning, problem solving and creativity.

Yoon Bahk, Robert Shadbolt, Shaun Belcher and Sarah Blake drew tirelessly throughout the event, offering illustrations, questions and personal takes on the event and its contributions. This publication accompanies the online special edition of TRACEY: Drawing in STEAM. The original papers can be downloaded and read there.

Follow Thinking through Drawing at:
  twitter.com/DrawCogs
  www.facebook.com/drawingandcognition
  drawingandcognition.blogspot.com

Special thanks should be extended to Simon Betts and Stephen Farthing of University of the Arts London, to Simon Downs and Russ Marshall from Loughborough University and to Judith Burton and Barbara Tversky, Columbia University for their ongoing support and encouragement.
As a designer who works with people from a lot of disciplines, part of my role in a multidisciplinary team is to act as the translator within the group and I do this most of the times by telling stories through drawings. As a visual scribe, my role is similar that I act as a translator who puts whatever is being said into a visual format.

The images you see here are the result of my live documentation of the Thinking Through Drawing Symposium 2012. For the event, I was asked to record the event through drawing. This type of task is commonly known as visual scribing or graphic facilitation. I see the goal of scribing to make ideas more broadly accessible to people of different disciplines and backgrounds who might speak a different language either due to their nationality or area of professional expertise. Having scribed at other events before this symposium was particularly interesting as the theme of the symposium involved drawing as communication itself, featuring Drawing in STEAM (Science, Technology, Engineering, Arts and Maths).

At such events I often draw somewhere where the audience or most of the people present can see what I'm doing. This is by definition closer to graphic facilitation forming a central role in Studio Jammo's activities.

Yoon Bahk

A native of South Korea, Yoon spent a good portion of her formative years in the USA and UK. She was trained as an industrial designer at KAIST (2006) in South Korea and then she moved to London where she was awarded a double Masters from the Royal College of Art and Imperial College London in Innovation Design Engineering (2008). Her background and education has given her a bilingual, multicultural and interdisciplinary outlook, enabling her to weave between the social spaces between cultures, disciplines including design and engineering, and commercial and academic worlds.

Since finishing her studies, Yoon has worked as a design consultant, developing innovation strategies using design thinking and methods to tackle problems. She has also developed toys with Laughing Onions Ltd., a UK-based toy inventor, since 2009. She has worked for companies including Unilever, PepsiCo, Barry Callebaut and LG. In 2011, Yoon set up Studio Jammo Ltd. Yoon has always been passionate about doodling and this had led to graphic facilitation forming a central role in Studio Jammo's activities.
facilitation than scribing, as I'm more involved in what's going on as it happens. In contrast, for talks and lectures, I'm more often located the back or side of the auditorium where people can't see my drawings until the talk is finished, which was the case of the TTD symposium.

As was the case at the TTD symposium, people at these events often ask how I can remember everything that's been said? The answer is, I don't! The information from the speaker is being filtered through me to be drawn, and I can only draw what I can understand. Transcribing what is being said into a written language is hard enough to keep up with someone talking, but to put this into a drawing, you have to go through an added step of translating it into another language: a visual one. So the truth is, what's going on in my brain is not frantically trying to keep a record of everything but rather boiling down what's important or interesting to me, while chucking out the minor details and things I can't comprehend.

Simultaneous translators like to get as much information about the talks or speeches they will be translating so that they can make sure they know all the words in the language to be translated and to understand the subject matter. It's the same with scribing. Prior to events, I like to be prepared with the right visual vocabulary that will represent what's being said as much as possible. At the TTD symposium I didn't get so much information in advance other than that the common theme for all the talks was drawing which luckily was somewhat of my own territory so I didn't need so much prep work beforehand.

Due to the theme of the symposium being on drawings, oftentimes, the speaker presented a drawing. Thus, not only was I simplifying what was being said verbally, but a lot of the times I was simplifying the drawings being presented into small, recognisable icons.

In summation, live scribing helps create a lasting memory of a lecture for an audience through imagery. These images are partially open to misinterpretation, which is also what makes them particularly interesting. People try and understand what I have drawn, they scratch their brains trying to remember what was said that triggered me to draw that, which in turn initiates an interesting inner discourse and sometimes with others. As a result, these drawings prove to be more inviting for people and they tend to revisit them more than their own, more 'verbatim' written notes of the event.
DRAWING IS...

COMMUNICATE WAS IT... PROCESS?

EXPRESSION? (PRODUCT)

DRAWING ART

NO DEADLINE

NOT INTERESTED

EVIDENCE & VALUE OF DRAWING
CAN VISUAL ARTS LEARNING IMPROVE GEOMETRIC REASONING?

LYNN GOLDSMITH

ARTISTIC ENVISIONING

3D → 2D
2D → 3D
ABSTRACTION
SHADOWS
NEGATIVE SPACE

DRAWING FROM OBSERVATION...

SEYMOUR PELLAGO
CAN WE TEACH IT?

BECKY GONA HOWARD

UNDERSTANDING THE VISUAL WORLD
3 DAYS DRAWING AT THE RCA

PHILLIPA LYONS
COLLABORATIVE DRAWING ACROSS DISCIPLINES
CRAFT & MEDICINE

HOW CAN DRAWINGS BE USED ACROSS DISCIPLINES & TO WHAT BENEFITS

EXPLORING & UNDERSTANDING THE BODY

WHERE DO YOU STAND ON METHODOLOGY?
DETAILED DISCUSSIONS QUESTIONNAIRE

STUDENT LED ENTHUSIASTIC DIALOGUE

EVIDENCE USEFULNESS OF DRAWING
IT'S APPLICATIONS?

DRAWING DISSOLVING....

COLLABORATIVE DRAWING
LEARNING JOURNEYS

DRAWING EXERCISES FOR META LEARNING

ACUMULATING KNOWLEDGE & APPLYING

SEEING THE WORLD DIFFERENTLY

CHANGING AS A PERSON

ABILITY EFFORT

HUM?
AH HA!
IT'S A DOG

PRECONCEPTION

DRAWING ON THE RIGHT SIDE OF THE BRAIN

DR. BETTY EDWARDS

EDDIE + KEN BAYNES

MODELLING AND DESIGNERLY THINKING

PHYSICAL MODELS

WINDOW CLEANER

FROM RUSSIAN WITH LOVE

QUICK ON THE DRAW

LANGUAGE OF DESIGNING

DRAW A REALISTIC PORTRAIT OF THE FACE

DRAW A VASE

WHAT!!

DIFFICULTIES OF UNSEEING

PERCEPTION & LANGUAGE

SCIENTIST AS GODS

TECH COMPREHENSION

DESIGNERLY THINKING

CREATIVITY

ISON 133 PROFESSIONS

QUICK ON THE DRAW

WINDOW CLEANER

FROM RUSSIAN WITH LOVE

PHYSICAL MODELS

INSIDE THE MIND

IMAGING

INSIDE THE MIND

IMAGING

INSIDE THE MIND
Shaun Belcher

Shaun Belcher is a prolific artist whose practice encompasses photography, painting, drawing, poetry and song writing. Belcher frequently posts his doodles on his blog, which functions like a diary. They retrace his mood, his frustrations with the arts scene or his views on the art world with a deadpan humour. His drawings are a mixture between comics, scribbles and caricatures and are made with an unhesitating black pen. The message is straightforward and clear. In some of his cartoons such as “Give me the Turner Prize, I am as shit as anyone”, his slang vocabulary as well his definitive statements can have something moving and aggressive at the same time – as if distant remnants of teenage hood.

His ironic and shameless comments on the art scene are indeed serious and make him at times sound desperately ambitious and direct. For instance “I am a pretentious 25 year old with no fucking skills but by networking, crawling, by doing voluntary works in a gallery I now have a small foothold on the art world…” By talking about his experience, he brings up questions that any artist might ask himself:

The STEAM conference was the first time I have drawn in public and I found myself analysing my drawings as I participated as well as finding myself drawn into the fascinating series of presentations. For that reason the style changes through the three days.

Early on I drew as I listened and pretty quickly found myself falling behind as not being used to live ‘scribing’. By midway in the proceedings I was starting to draw single cartoon equivalences of the lectures or actually attempting interactive drawings as part of lectures e.g. self-portrait by touch.

By the end I was drawing so much some off-subject jokes and doodles crept

Shaun Belcher and Moogee the Art Dog at Thinking Through Drawing 2012
How can I be visible as an artist in a saturated art scene? Can I make a living from my work? How can I network even more than I currently do? Even though his works refer a lot to very English contemporary art events such as the Turner Prize or the Nottingham art scene, they can apply to every artist striving to succeed and to be recognized.

Shaun Belcher was born in Oxford in 1959. He is currently living in Nottingham and is now a multimedia lecturer at Trent University, freelance web designer and practicing digital artist. To see more of his work registered on Saatchi Online visit http://www.shaunbelcher.com

in and finally I ended up drawing a complete cartoon booklet using the free blank booklet given out at beginning of conference. I thoroughly enjoyed the whole event even though I was a bit drawn-out by the end! I look forward to further opportunities to wear out my collection of Sharpies!
A poor dog artist from
Nottingham was asked
to come to London...

Woof
Woof

Please come and scribble

And Moogee
Dropped his stick
And set off
to visit the
crazy world of...

Moogee found a Kernel
of Holiday Inn
Which was being rebuilt
And was a bit noisy but

Dan

Drawing

Research

Cognitive, haptic, etc

Abba
Sometimes moogee didn’t understand everything but drawing helped his doggie 2 + 1 = 6 comprehension. 3 + 1 = 9 (except maths he was a non-mathematical dog)?

but moogee kept trying but [circled] ‘knotty’ problems or not had a good time. Now he is going to become a research dog.
Now Moogee is considering a position at Baskerville University PLC as a professor of canine cognition (acting).

© Moogee 2012
Thinking Through Drawing Symposium 2012

- The Truth of Where Drawing Goes
- What Children Know
- Student Bodies
- Gesture Aids Learning
- Observation Aids Learning
- Methodology follows Measurement
- Designed to Death 1990-2050
- An Exquisite Corpse Dearly Missed by All
Thinking Through Drawing Symposium 2012

- What does social learning mean?
- Further work
- How can we know
- Mixing methodology?

- Learning process

- Identity of students

- Findings?
  - Expectations about drawing dissolve
  - Critical looking – Medical looking
  - Collaborative – Learning from each other
  - Embodiment – Intimacy
  - Meta-cognitive awareness

- Anatomy labs + skeleton in art studio

- Drawing and learning across disciplines

- Short module – fast pace

- Variation in tasks
  - Delivered in art studio and clinical settings

- 3D Design + Medicine

- Year 3 module/12 sessions

- Philippa Lyons

- Colab. R., Project (Human Anatomy)

- How can learning be used across disciplines?

- For what benefit?
INSTEAD OF ONE: FIFTY SHADES OF GREY
ART FINE METHOD TEOLOGY

THEORY

SOFT
A Knotty Problem

Moogee’s Theorem of Sticky Theory

d + s

\[ d \sqrt{s + d} = 0 \]
\[ d \sqrt{s - s} = 0 \]
\[ d + s + a \]
\[ -d - s + a \]

Dog + Stick → Dog minus Stick → Dog + Stick
These drawings are an attempt to think about the connections between the drawn mark, the written word and the space that surrounds them. They are composite images – part note, doodle, scribble, and sketch. The drawings were made in response to what I heard and saw. They function as reminders of some of the talks I listened to that day – the drawings are made up of words and phrases, fragments of diagrams and symbols, often woven together in an intricate surface of pencil and ink marks.

The words become marks, and the marks turn into text. It is this relationship between drawing and writing – that I aimed to explore. Making work and then immediately putting it on display was a freeing process.

As the day went on I became less and less self-conscious and the drawings, I think, became more playful.

For more examples of my work visit sarahblakeartist.tumblr.com.
Thought is internalized action.

Diagrams entail mappings between mental and spatial metaphoric space and action.

Gesture is a physical map between thought and its store.

 peçaing

Omit irrelevance.

Don’t need to see the drawing.

Extract the essence of ideas and open space.

Nominal explanations: neural structure and functional complexity.

Lines - paths, connect, relate.

Arrow - directed relation.

Circles - in space.

Set - block.
I can't do this.

I don't have the ability.

The way people already...
Thinking Through Drawing Symposium 2012

Can't see the forest for the trees?
Reflect, observe, experience.
Drawing may also be an art form.
Drawing may also be a form of communication.

Mechanical drawing

Drawing as an embedded experience

Expectations are specific, or craft or medical student.
Individual and collective experience.
Design as a third culture
Scientists; mathematicians; window cleaners

Art

Modeling

Design

Purpose of drawing - explaining things

Schematic
Art

Modeling

Design as a third culture

Scientists; mathematicians; window cleaners

Designing thinking in a dangerous characteristic

Design

Purpose of drawing - explaining things

Simplifying

Scenic
ability to estimate

Draw the shape

given in 2D, can you imagine in 3D?

given the shapes of objects in 3D and try to imagine how they would look in 2D and 3D.

Engineer in three dimensions, how to understand space?

at some designs, architect or builder
Robert Shadbolt
The Symposium
DRAW
CONTINUE
STRAIGHT
LINE
BETWEEN
INTERSECTION
OR
PERSON
UNTIL
FINISHED
The Symposium

- Many hats and only one head
- Work - reject then asserts
- Depends where you are coming from
- CASE STUDIES - narratives
- Replicability - reliability - emergence
- Getting to know
- No life room!
- Same questions
- Can’t be answered
- Sometimes
- Repeatability
- Free thinking
- Separation
- When is a barrier

Collective Action.
‘The Articulate Hand’ performance. Image courtesy of Andrew Dawson