THE FUTURE “ORDER” OF ANATOMY EDUCATION
OBSERVE-REFLECT-DRAW-EDIT-REPEAT

Mark Backhouse, Mike Fitzpatrick, Jos Selwyn-Gotha, Rachael Allen and Iain Keenan

iain.keenan@newcastle.ac.uk
@dr_keenan  #NCLLT
Study anatomy by critical observation

Observation and reflection
ORDER: STEP 2 REFLECT

Observation and reflection

ORDER: STEP 3 DRAW

Reflect on observed anatomy

Abstract conceptualisation

Reflect on observed anatomy

Abstract conceptualisation
All medical, dental and biomedical (n~700 new students per year) at Newcastle learn anatomy.

Methods often used based on historical, financial, personal preferences.

Lectures and dissecting room practicals. Variety of methods.

Dissection, prosection of cadaveric material.

Plastic models, clinical images, body painting.
CURRENT APPROACHES TO ART IN ANATOMY

- **What?**
  - Drawing
  - Modelling
  - Body painting
  - Performing arts

- **Why?**
  - History and tradition
  - Instinctively valuable
  - Anecdotally enjoyable
  - Introduces variety - engaging
  - Artistic background of students
ARTISTIC METHODS: RATIONALE AND CURRENT EVIDENCE

Rationale

- Relatively low costs
- Application to multiple disciplines
- Drawing can fulfil components of experiential learning [1]

Evidence

- Variety is important for learning [2]
- Visualisation is major learning approach by medical students [3]
- Drawing, critical looking and reflection can enhance anatomy learning [4-8]

ARTISTIC INTERESTS OF NEWCASTLE MEDICAL STUDENTS

- **28%** have previous art qualifications (GCSEs, A-levels)
- **18%** draw in their spare time
- **56%** draw when studying or revising anatomy

% of students with background or interest in art and drawing

- Formal art qualifications
- Drawing in spare time
- Drawing in anatomy self study

n=88
52% of Newcastle Medical Students Prefer to Study Anatomy Visually

“Which method do you normally prefer to use in order to learn anatomy?”

- Visually: 52%
- Writing notes: 19%
- Handling prosections and models: 11%
- Reading: 10%
- Listening: 8%

n=177
*Stage 1 MBBS

laikeenan@newcastle.ac.uk @dr_keenan #NCLLT
96% WOULD PREFER SOME DRAWING IN ANATOMY SESSIONS

“In practical dissecting room anatomy sessions I would prefer…” n=150

- Drawing only: 35%
- Combination with drawing as main component (every session): 13%
- Combination with drawing as a supporting component (every session): 4%
- Occasionally use drawing (not every session): 4%
- Never use drawing: 46%
1. Student partners
   - Metacognition – thinking about learning
   - Research experience opportunities
   - Skills - Critical thinking, independence, teamwork
   - Project framework and measurable outcomes

2. Artistic learning methods
   - Range of abilities, confidence, engagement
   - Art as a learning process
   - Cross-discipline peer-peer learning
   - Range of techniques: personalise, variety

3. Evidence-based approach
   - Limited evidence to support artistic methods
   - Limitations of student perceptions
   - Objective measures of what works
   - Perceptions can identify how/why
ORDER cycle

1. OBSERVE
   - Study anatomy by critical observation

2. REFLECT
   - Reflect on observed anatomy

3. DRAW
   - Abstract conceptualisation

4. EDIT
   - Discuss and modify drawing

5. REPEAT
   - Accumulate knowledge and skills

- Concrete experience

Based on experiential Learning Cycle: Kolb (1984)

Student-designed (Mark Backhouse)
EVIDENCE BASED APPROACH CROSS-OVER RCT – MARCH 2014

- **INTERVENTION:** ORDER Thorax
- **CONTROL:** “Traditional” Abdomen

Student-led (Mike Fitzpatrick)

One hour session - 6 groups of 10 students
Each with one anatomy demonstrator and art student

- 1. Pre-test
- 2. Warm up drawings
- **3. ORDER**
- 4. Repeat x5
- 5. Summary drawing
- 6. Post-test and feedback

n=155
79% of students showed some improvement using ORDER (87% with normal)

30% of all students showed greater improvement in test score with ORDER compared to “normal” methods

1 in 3 students could benefit from introduction of ORDER into curricula

Equivalent of 230 Newcastle anatomy students per year
71% enjoyed the ORDER session

81% perceived that ORDER had improved their knowledge of surface anatomy of the thorax (79% did)

60% would recommend repeating the same session

63% would recommend ORDER to future medical students
87% WOULD USE ORDER IN FUTURE ANATOMY SESSIONS

“In future practical dissecting room anatomy sessions I would prefer…”

- ORDER only: 35%
- Variety with ORDER as the main component (all sessions): 13%
- Variety with ORDER as a supporting component (all sessions): 39%
- Occasionally use ORDER: 11%
- Never use ORDER: 2%

n=155

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FEEDBACK COMMENTS
AND POTENTIAL SOLUTIONS

“An optional drawing group would be good”
Revision session/workshop

“Helped more with revising what I already knew”

“I would like to use ORDER as part of a larger session or as a supporting technique”

Use ORDER to complement traditional methods

“I don’t like drawing”
Investigate alternative artistic methods

“Don’t use ORDER”

“Good session, but not how I prefer to learn”

“I would prefer to see the image while drawing”

“Don’t use ORDER”

“There wasn’t enough time for each step”

Modify ORDER process and/or develop for use in self-study

“I would have liked more guidance and teaching”

Don’t use ORDER

“I would have liked more guidance and teaching”
ORDER FOCUS GROUP MAY 2014

Student-led (Jos Selwyn-Gotha)

- 85% of students still using ORDER for revision (n=7)
- Quantitative data – delayed MCQ showed minimal effect
- Qualitative
  - Students would like online ORDER resource for self study
  - ORDER in lectures suggested
  - Embryology resources requested
At the end of their projects all student partners (n=3) strongly agreed/agreed they had:

- Developed knowledge of medical education research
- Developed increased understanding of their own learning
- Developed transferable skills
- Developed skills in designing research in medical education
- Found the project valuable to their learning
- Found the project valuable to their personal development
- Overall found the project to be a valuable experience
HOW WOULD MEDICAL STUDENTS LIKE TO USE ORDER IN FUTURE?

1. Lectures
2. Gross anatomy
3. Clinical imaging
4. Self-study – Drawing
5. Self-study - Online tutorial
6. Smartphone/tablet application

(n=106)
THE FUTURE: ORDER

- **ORDER in gross anatomy, clinical imaging**
  - June 2014 evaluation, summer student partner projects

- **ORDER in self study – e-learning**
  - Summer student partner project

- **ORDER and artistic modelling**
  - NICAP funded project
  - “Draw” becomes “Do”

Newcastle Institute for Creative Arts Practice

lain.keenan@newcastle.ac.uk @dr_keenan #NCLLT
ORDER: STEP4 EDIT

- First rib
- Manubrium of sternum
- Body of sternum
- Xiphoid process
- Costal cartilage

Discuss and modify drawing

Active experimentation

First thoracic
ORDER: STEP 5 REPEAT
(MORE DETAIL ADDED)

Accumulate and apply knowledge and skills

Concrete experience
**MBBS Student Partners**
- Mark Backhouse
- Mike Fitzpatrick
- Jos Selwyn-Gotha
- Ayat Bashir
- Charankumal Thandi
- Gokulan Suthermaraj
- Joseph Hutchinson

**Art student facilitators**
- Kevin Christensen
- Jennifer Prevatt
- Kathryn Brame
- Sofija Sutton
- Rachel Derbyshire

**Artistic collaborators**
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- Dr Eleanor Holmes
- Anne Procter
- Eve Laws
- Newcastle Medical/Arts Interface Network
- Fine Art and NICAP

**Anatomy and Clinical Skills**
- Anatomy demonstrators
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  - Dr Lucas Arnott (FY2)
  - Dr Tom Bradish (FY2)
  - Dr Lynsey Rae (FY2)
  - Dr Laura Watson (FY2)

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iain.keenan@newcastle.ac.uk
@dr_keenan #NCLLT