Rationale
Since the illustrations of Leonardo da Vinci in the 15-16th Century, artistic portrayals of human anatomy have been used in education. Modern students of anatomy take a variety of approaches to learning including visualisation [1] and while there is limited evidence to support the idea of students as visual learners [2], creating artwork can fulfill components of experiential learning [3] and it is known that visual artistic techniques can improve learning [4].

A small number of studies have investigated artistic techniques as methods of learning anatomy, such as body painting [5,6] and modelling or drawing [7-9] but few studies have collected empirical evidence to measure improvements in learning. The incorporation of learner-centred or problem-based approach to student learning is effective in medical education [10] and randomised controlled trials are the most powerful method of identifying effective interventions [11].

Hypotheses
1. A student partner approach will enhance the student experience in anatomy education.
2. Generating robust, quantitative evidence of the impact of artistic methods on student learning will be most effective in supporting best practice.
3. Introducing artistic techniques to anatomy teaching sessions will improve learning.

Aims and objectives
1. To provide and encourage a student partner approach to anatomy teaching and learning.
2. To generate and promote use of good quality evidence to support best practice in anatomy teaching and learning.
3. To incorporate and advocate implementation of research-led teaching strategies into the Newcastle University medical curricula and beyond.

Methodology

Students as partners
• Medical project students will be deeply involved in designing the study and analysing data.
• A student reference committee will be established to steer and evaluate research.
• Links will be forged with School of Arts and Culture to foster cross-discipline peer-peer learning.

Evaluation studies
• Drawing interventions will be included in practicals and lectures.
• Students will be pre- and post-tested with 15 MCQs of assessment standard.
• Statistical analysis of data by paired t test or Mann-Whitney U test will identify significance.
• Qualitative feedback will be collected to evaluate value of partner approach and interventions.
• Deeper, longer term learning will be measured by delayed MCQ or formal assessment.

Anatomy drawing in practicals
• Cross-over randomised controlled trials will be conducted during dissecting room practicals.
• A pilot study will be conducted during a postgraduate practical session (n=25).
• Stage 1 MBBS anatomy students (n=250) are divided into two groups.
• Students will be taught based on MBBS learning outcomes for Thorax and Abdomen.
• Group #1 will be taught with drawing intervention, with art student facilitators.
• Group #2 will serve as control and will use standard methods.
• Groups will then cross-over for subsequent practical sessions.

Anatomy drawing in lectures
• Cohort studies will be used to investigate the impact on learning of student drawing.
• Following a pilot study, tasks will be introduced into three large group lectures (n=250).
• All students in the cohort will experience the same tasks.
• Lecture #1: No tasks. Lecture #2: Drawing Tasks. Lecture #3: Non-artistic tasks.
• Tasks will be included in 10-15min lectures in >5 minutes breaks after 20 and 40 minutes.

Projected impact
• This approach will have valuable impact on student engagement, experience and learning.
• Artistic learning methods will be incorporated into MBBS anatomy teaching.
• The use of a partner approach and robust methodology will be advocated through engagement, dissemination and collaboration.
• This approach and methodology will be utilised to investigate further anatomy learning methods.