More than a building: Liverpool’s Central Teaching Education Broker

Dr Lis Rushworth
Dr Helen Vaughan
Dr Cate Cropper
Dr Kathy Johnson

https://www.liverpool.ac.uk/central-teaching-hub/
Conceived in 2006, due to a need to refurbish existing laboratories.

Main drivers for collaboration:

• More Space
• Higher occupancy
• New equipment
• Facilities for new teaching activities
CTL Discipline Areas

- Physics
- Chemistry
- Archaeology
- Environmental Sciences
• Winner of the Educate North Award for Best Student Experience 2015

• Winner of the Guardian HE Award for the Best University Facility 2013

• Winner of the S-Labs Award 2012
- 16 Members of support and teaching staff
- 13 technicians plus 3 Lecturers (Teaching & Scholarship)
- Supervisor is responsible for all CTL Technicians the operation of the building and in addition provides technical support to the 1st floor
CTL project academic development team:

- *Academic lead for CTL*: Prof Paul Nolan (Physics)
- Prof Andreas Lang (Geography)
- Dr Alan Boyle (Geology)
- Dr Matthew Ponting (Archaeology)
- Dr David Cooper (Chemistry)

Academic aims:

- Collaboration between disciplines
- Improved student skills opportunities
- Student project expansion
- Improved student employability
- Pedagogic developments in laboratory learning, teaching and assessment
The University’s Central Teaching Laboratory has been nominated a finalist for Higher Education Academy’s (HEA) Collaborative Awards for Teaching Excellence (CATE).

The collaborative award reflects the key role that teamwork has in promoting student success through learning and teaching.

Geologist Dr Elisabeth Rushworth with scholarship interests in internationalisation and interdisciplinary team work

Physicist Dr Helen Vaughan with scholarship interests in embedding employability skills through in-curriculum and co-curricular learning experience

Chemist Dr Catherine Cropper with scholarship interests in digital laboratories and engaging parents and children in STEM.
**Broker** *noun*

a person who acts as an agent for other people in buying and selling goods or property [usually for commission]

a negotiator or middleman


**Education Broker** *noun*

a scholar who acts as an agent for other academics in developing new or using existing resources and educational literature for scholarly commission

a negotiator and implementer of change in educational practices

Our definition is still in development
The Education Broker Model

School of Electrical Engineering, Electronics and Computer Science

School of Engineering

School of Physical Sciences

School of Environmental Sciences

Department of Archaeology, Classics and Egyptology

Faculty of Science and Engineering

Faculty of Humanities and Social Sciences

Education Brokers

Advisors

Implementers

Researchers

CTL L&T
A group of co-located satellite academics who orchestrate collaboration between disciplines

• Traits of the role
  • Discipline specific lecturers with cross-discipline pedagogical interests
  • Coordinate
  • Negotiate
  • Collaborate and Network across University and with external parties
  • Bring about change
  • Implement and then hand over
  • Investigate potential resources
  • Identify opportunities
  • Freedom to be selfless
  • Scholarly commission
Benefits to the University

Outward statement of University’s belief in teaching and learning

• Modern and professional venue for learning and teaching
• Capacity for increased student numbers
• Hub of technical skills development in support staff
• Focal point for collaboration in teaching innovation
• Professional and flexible venue for international conferences
Benefits to Existing Disciplines

- Modern, accessible laboratories and social space
- Access to specialised laboratory environments for all disciplines
- Flexible availability for non-timetabled access to support project work
- Promoting new and improved pedagogies e.g. convenient environment for group work
Pedagogic Developments

• New styles of teaching
• Teamwork developments
• Cross-disciplinary
• Spiral Learning
• Sociomaterialism
• Digitising labs

A planetarium show to visualise the 'Heliacal Rising of Sirius’ (10-15 students pa)

“…it was not until I began to work with the CTL that I was able to teach this fundamental concept meaningfully. … classes of undergraduate students witness the event in real time as if they were standing in Egypt” (Dr Glenn Godenho, Egyptology)
Spiral L&T model

Complex equipment, Complex theory, Design own method
Unknown answer

Complex equipment, Simple theory, No freedom in method
Known answer

Complex equipment, Simple theory, Design own method
Unknown answer

Simple equipment, Simple theory, No freedom in method
Known answer

Simple equipment, Simple theory, Design own method
Unknown answer

Complex equipment, Complex theory, No freedom in method
Known answer

Complex equipment, Simple theory, No freedom in method
Known answer
Benefits to Students

- Access to research and industry standard equipment
- Access to internships
- Expansion of project opportunities
- Cross-disciplinary skills
- Improved opportunities to develop communication skills

Resulting in improved employability skills
Equipment Improvements

- Cross-discipline working enables stronger financial requests
  - More equipment
  - More expensive equipment
- Student projects with industrial partners

"The equipment provided [supported] from companies such as Canberra allow hands on experience with research/industrial grade [radiation] detectors from first year of the undergraduate programme, increasing confidence in pursuing a physics related career or postgraduate degree" (Physics graduate)
• Chemistry and engineering students; working with a domestic oven manufacturer to test “variance in nutritional content depending on cooking method using prototype ovens”.

• Geology students; investigations on archaeological material “238U/206Pb dating of Quaternary sediments using lacustrine calcite crystals”.

• Physics students; investigations on geological and archaeological material, including “Gamma ray spectroscopy of environmental samples” and “Investigating Viking slag”.

“I found it beneficial to merge the two disciplines ... Firstly, by introducing completely new topics to the fold, interest and creativity was sparked that wouldn't have normally have been generated for generic, expected topics”. (Geology student)

“Being in an open planned laboratory with multiple subjects … made working together a lot easier.” (2nd year physics student)
Variety of Academic Apprenticeships

• Usually summer projects
• Offers and competitive application
• Single and cross discipline projects
• Student partnerships
• Projects with external partners
• Pedagogic developments
• Undergraduate teaching materials
• Outreach resources

“Collaboration is unique selling point for the university, particularly since scientists often mix within industry (i.e. Quality Assurance/Control laboratories).” (Chemistry graduate)

Example project: cross-disciplinary E-learning initiative to test the use of tablet PCs in the teaching labs as an alternative to lab books and for data capture. “I learnt a fair amount from him about the differences in physics and chemistry.” (3rd year chemistry student)
Cross-disciplinary Teaching

• Cross-discipline
• Cross faculty
• Central funding
• Centralised access to space and equipment
• Brokers not tied to single discipline
  • Geoarchaeology
  • Geography (with wider geoscience)
  • Spectroscopy in space

Geoarchaeology Year 3 Module

“I found it beneficial to merge the two disciplines [Geology and archaeology].... by introducing different ... students from numerous schools many different ideologies and ways of thinking can be shared and as a result of this, conclusions and questions that otherwise wouldn't have been entertained are brought to the table.”

(Geology graduate)
Student Communication Skills

- Undergraduate modules
- Schools outreach events
- Teamwork
- Student societies
- Schools and local interest groups
- Hosted in CTL and schools
- Supported by Educational Opportunities
- Faculty wide
- Science Jamboree #SciJamLiv

“Through undertaking the module “Science Communication” …. I was able to get an important insight into the life of a teacher …. I have no doubt that this course has instilled a passion for STEM communication to children and adults of all ages.” (Undergraduate student)

"Really good experience. I’d say even for jobs as well, not just for teaching." (Undergraduate student)

".. it’s giving you that extra edge that I think a lot of candidates wouldn’t have." (Undergraduate student)
HiPy - Hive Learning of Python

JOIN THE HIVE
For communities of students who want to learn Python.

Idea from Dr Rob Treharne (DTC manager) for PG students to learn Python. Visited CTL academics who expanded the vision to include UG for HEAR statement.

Found initial space & equipment and helped promotion of the venture through our networks.

Led to departments rethinking current programming provision.

Now attended by UG, PG, staff from across the university and externals.

Potential pedagogical research project…
Scholarly Commission

What is in it for us?

CTL Academic
- Teaching and Outreach
- Research/scholarship
- Administration

Education Broker
- Leadership opportunities
- Professional recognition
- Network development
- Widens pedagogical impact

Education Broker
• You don’t need a building – but a catalyst for change is valuable
• Form a recognisable team of network enablers
• EBM is applicable across disciplines - not just for STEM
• Co-location of brokers – coffee mornings?
• Essential sharing of good practice across disciplines in terms of teaching, policy and strategy
• Drive to further teaching practice development & pedagogy
• Leaders in educational change