

# Vicarious learning and teaching of clinical reasoning skills

**Project grant holders: Richard Cox, John Lee, Rosemary Varley and Julie Morris**

## Aims

Our aim in this project is to find out more about how and why "Vicarious Learning" (VL) works. VL is the notion that people can and do learn through being given access to the learning experiences of others. Traditional examples:

- master classes in music
- clinical teachers going through cases with students
- Gardeners' Question Time

In these situations, one person or student is the focus of tutorial attention, but others present will benefit from observing the interaction. Also, as teachers know, many students are unwilling to indicate their need for help in class – such students learn a great deal from observing and overhearing the learning experiences of others. Evidence suggests that students' reasoning processes can be very different to those of experts.

We therefore hypothesise that students may, in some circumstances, relate more easily to the experiences of other students than to those of experts. A broader application of the VL idea envisages it being used in the development of multimedia databases of learning experiences which can be made available to other learners (see box).

## PATSy

In this project we aim to add VL resources to an established on-line learning resource called PATSy.

- PATSy is a web-based ([www.patsy.ac.uk](http://www.patsy.ac.uk)) multimedia database shell that makes 'virtual patients' available to trainees, educators, clinicians and researchers in various clinical professions and cognate academic disciplines.
- PATSy is in wide use in clinical science departments in over 25 UK university departments (see photograph).
- PATSy 'virtual patients' can have cognitive assessment tests 'administered' to them by users but with the opportunity for unlimited rehearsal, anytime access, etc.
- PATSy contains over 60 'rich data' cases covering developmental reading difficulties, neuropsychology, neurology/medical rehabilitation and speech and language pathology.
- PATSy supports case-based teaching & learning, problem-based learning and continuous professional development.

## Significance

The research will contribute to knowledge in the area of learning by researching the efficacy of 'vicarious learning' (VL) or 'learning by observing the learning of others'. We seek to identify the characteristics of effective VL content for clinical teaching. VL effectiveness will be examined in a new context – that of casebased teaching. A controlled comparison of the effects of dialogue (student-tutor) versus monologue (tutor discourse) will be conducted. Research questions include:

- What clinical reasoning events trigger VL activities by learners, e.g. reaching an impasse in diagnostic reasoning?
- Which type of VL resource (dialogue vs monologue) produces better learning outcomes?
- Do students benefit from VL in terms of their use of the language of the profession (e.g. speech and language therapy 'register') in written and spoken communication following training?

The effectiveness of VL in relation to two kinds of knowledge will be evaluated. These are:

- clinical reasoning skills (eg. Hypothesis testing, search space reduction heuristics, deductive reasoning, knowledge of theory, knowledge of psychometrics);
- enculturation in terms of use of professional language i.e. the 'talk' of the profession.

## The programme of work

During the research we will focus on the use of PATSy in the education of speech and language therapists. An important component of speech and language therapist education is to teach students how to diagnose language-processing difficulties. Diagnosis is a relatively ill-structured task and often there are no 'prototypical' cases to guide the novice. A large range of skills are required:

- knowledge of language processing
- knowledge of a wide range of neuropsychological tests
- an ability to think of patient performance in terms of a degraded normal model
- ability to efficiently reduce the 'search-space' of the problem

In this project we aim to study pairs of individuals using PATSy. Student-student and student-clinician pairs will be studied as they attempt diagnoses of 'virtual patients' using PATSy. Their dialogues will be videotaped and their interactions with the PATSy system recorded. This data will be analysed, allowing us to identify the difficulties that students encounter with clinical assessment and diagnosis.

Next, we will develop techniques for eliciting effective dialogues via task-directed discussion (TDD) exercises. We will use the TDD technique to produce new dialogues suitable for use (and re-use) as efficient VL resources. The new recordings of discussions about the difficult topics will be incorporated into PATSy as VL learning resources. Thus, when future PATSy users encounter learning blocks, they can retrieve an appropriate pre-recorded discussion of the issue to view.

## Anticipated outcomes

These include the development of a national online dialogue database for educators, clinicians and students across the UK for use in undergraduate, work-place based learning (WBL) and continuing professional development (CPD). The project should contribute to clinical educational practice by providing a model for emulation by other domains, and by the encouragement of evidence-based practice in clinical teaching. The results will also have implications for teaching and learning practice in other knowledge intensive domains where case-based modes of instruction are common (e.g. education, law, medicine and architecture).

### Contact details:

Dr. R.J. Cox,  
School of Cognitive and Computing Science,  
University of Sussex,  
Falmer, Brighton, Sussex BN1 9QH  
Tel: 01273 678605