Vicarious Learning and Dialogue

John Lee
HCRC
University of Edinburgh
Vicarious Learning

• Learning from exposure to *the learning experiences* of others
• E.g. students learn by watching other students’ problem solving in class
• E.g. master classes, design crits, etc.
• Even though students may not actively participate in a discussion, Vicarious Learning arises from active listening and watching
• Not just *observational learning*, because this is often from simply observing (perhaps expert) *performance*
• So it’s somehow based on access to the learning process
Vicarious learning and dialogue

- Learning process needs to be somehow *articulated* and *externalised* for others to access it
- This is naturally achieved by dialogue (if nothing else)
- Dialogue identified by Laurillard (1993) as a distinctive feature of higher education practice
- Dialogue is a central part of the process of *enculturation* into a discipline
- Acquiring the language and “professional register” is crucial to enculturation
  - (“talking the talk”)
Dialogue and learning

• Also emphasised e.g. by Schön (1985)
  – The “reflective practitioner” works through “reflection in action”
  – Acquired through dialogue offering induction into the culture
• Cf. Wenger’s (1998) communities of practice
  – Community of learners becomes community of experts
• Enculturation apparently promotes (and depends on) some kind of empathy between community members
• Postulate that people can obtain these benefits vicariously from observing educational dialogue
Learning and empathy

- Suggestion then is that this form of empathy can be developed by processes such as
  - Working on common problems
  - Needing to develop (and starting to use) a common language
  - Gradually coming into conceptual alignment
- ... and that the latter, especially, can be powerfully supported vicariously in the right kind of context, through exposure to dialogue
- And we propose that dialogues can be captured (e.g. on video) and have similar effects for other learners
Vicarious participation in dialogue

• Constructivist intuitions claim that actual participation is critical for learning from dialogue
• The process needs to be gone through, not merely observed
• But perhaps the process can be gone through even without direct participation
• If the observer can get “inside the skin” of the participant, they can participate vicariously …
• … encouraging e.g. conceptual alignment
Activity and learning

• Activity is commonly agreed to be central to learning
• Chi et al (2008) propose the “active/constructive/interactive observing hypothesis”
• This postulates that overhearers who collaborate *with each other* (e.g. in pairs) will learn more effectively than those who don’t
• So these vicarious learners are constructing an activity among themselves, based on the activity of the original participants, and learning benefits
• (Does this mean vicarious participation is improved, or that it’s better exploited? How could we tell?)
Alignment and overhearers

- Schober and Clark (1998) argue that understanding and alignment is much reduced for overhearers ...
- Also Pickering, Branigan and co. show that *syntactic priming* occurs less for overhearers ...
- **But**, in both, overhearers do get significant effects
- For sure, overhearing, or vicarious participation, is *not the same* as direct participation, but it can achieve at least significant levels of the same effects
- Probably by paralleling the activity, at various cognitive and other levels, of the participants
Perspectives and vicarious learning

• Fox Tree and Mayer (2008) show that overhearers pick up more when there are more “perspectives” exposed in the material they overhear
• Perspectives are different ways of describing similar things
• There are more perspectives in dialogue than monologue, and more in some dialogues than others
• Similarly, perhaps, Schober and Clark’s “late overhearers” picked up less, after dialogue had become more aligned and perspectives were reduced.
Alignment again

- So it seems that learners need to go through a whole process:
  - Initially perspectives are open, alignment is low
  - Finally alignment is high, perspectives are closed down
- Vicarious Learners need to share the journey; can’t come in just at the end
- But this is the same for all learners; there are no short cuts to becoming part of a culture
- But if we are right, then observation of dialogue can be a powerful tool for e.g. distance learners, and others whose opportunity for participation is limited
Application in technology

• Vicarious Learning can be practised by watching a tutorial, or sometimes a lecture, on-line
• Watching and listening to peers’ problem solving can be especially helpful
  – peers might choose different expressions from tutors
  – increase in empathy
• So let’s capture learning dialogues and make them available to other learners!
• Will work best if dialogues are closely related to the learning situation of the vicarious learner, e.g. address a problem currently faced …
Two approaches

• A: Diagnose the situation of the learner, then find and offer dialogues that match as closely as possible
  – dialogues have to be analysed and categorised
  – … or possibly staged artificially …
  – diagnosis has to be feasible and robust
• B: Collect dialogues promiscuously and leave it to the students to decide which ones are useful and how
• A is much more expensive; B is more uncertain
• We have tried both …
VL-PATSy

- Extension of existing learning system for speech pathology
- “Virtual patients”: video, history, test results
- System tracked students’ attempts to diagnose patient, identified wrong turnings etc.
  - Student model based on expert judgement of optimal paths
- Offered VL materials made from staged dialogue games based around topics relevant to problems
- Complex rule-based system
  - Expensive to produce
  - Expensive to port to any other domain …
Perspectives and activity again

• Perhaps the idea of perspectives fits with a broader approach to collecting dialogue
• Regular tutorial sessions include a potentially wide range of perspectives …
  – … but a huge amount of material of variable quality and value
• Reviewing this material is in itself a valuable activity …
  – … that students can carry out collaboratively (online)
• So we envisage a collaborative activity of reviewing and editing videos of typical tutorials
• A community of learners creating their own re-usable resource collection
YouTute

- YouTute is a web-based tool that gives students the opportunity to watch video recordings of their own and fellow students’ learning
- Vicarious Learning is augmented with the ability to collaboratively select, structure and compare a range of learning experiences relating to a particular topic
- Students can define “tutes” (short tutorial video segments)
  - can tag tutes, and annotate tutes with free text
  - can use existing or new tags
  - tutes/tags are searchable
Capturing process

• 3 video cameras in each tutorial
• Usually aim for 3 tutorials per course
• Tapes digitised and converted to Flash (VP6)
  – (will transition to mp4)
• Streamed from Red5 server (open source)
• Several courses covered
  – Informatics 2A, 2009
• ➔ Large amount of material!
Interface - Right

- **YouTute** interface design:
  - Three videos (class, tutor, Smartboard)
  - Buttons to control videos and create new Tutes
  - Slider to scroll video back and forward
  - Elapsed time index
  - Feedback box
Interface - Left

- **YouTute** interface design:
  - Tutorial menu
  - Topic menu
  - Tutes selection
  - Tagging
  - PDF (e.g. tutorial questions; lecture notes)
YouTute - Interface

Inf 2B: Hash Tables
Lecture 4 of ADS thread

Mary Cryan
School of Informatics
University of Edinburgh
29th January 2008

Click here to take the survey
Your feedback! Please use this input to submit any thoughts or comments about the interface. They will be sent directly to the YouTute creators.
YouTute - Experiences

• Very little resistance to collection of videos
• Technical problems delay deployment
  – need ongoing development resource
• Timing seems to be important
  – students hard to engage later in semester
  – even close to exams, though good revision tool
• Most popular with resit students …
• Need to integrate into normal teaching activity from start of course
YouTute - Future Development

- Individualised tute collections
- More developed “social networking” model
- More interactive “virtual editing” of tutes
- Integration with recorded lectures
- More streamlined collection process and back-end
- Automated identification of useful tutes
  - with automated tagging and annotation …
  - … and automated content linking to lectures and other materials
- Enhanced semantic search options for video materials
The theory in a nutshell …

If we can combine the benefits of learners collaborating to develop a shared activity, with those of learners deriving broader cognitive stimulation from a wider range of perspectives in the material to which they are exposed, then we should see significant gains in the power and potential of vicarious learning.

This lecture is based on a short paper (including references etc.), available from: