Scripting at the tabletop to improve collaboration

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1 Research

Interactive collaborative tabletops are promising devices that can help collocated people collaborate because they augment natural round-table discussions with a shared digital space that offers equal opportunities of actions and access to resources available. We propose collaborative scripts for enhancing tabletop collaboration in the form of: guidance and structure; advice on how to do the task; and control over constraints afforded by the tabletop.

After studying the ways people have used tabletop interfaces, we concluded that it is valuable to define scripts that will help people collaborate more effectively in co-located, technology-enhanced scenarios [3]. Different from scripts investigated so far, our work allows learners to negotiate over the scripts – initially explored in the domains of brainstorming, concept mapping, and collaborative poster creation.

Brainstorming – a technique to encourage creativity in small groups. Our method separates the technique into three stages: idea generation; idea organisation and reflection [1]. Each stage is scripted through the use of negotiation elements that alter a stage. The system presents a choice between users leading negotiation or a facilitator making choices, for example: whether to enable touch input; whether to colour ideas (to show authorship); etc.

Concept Mapping – a technique to help learners represent knowledge about a given topic in a graphical format, making use of meaningful propositions to link concepts in a domain of interest. Building a concept map at the tabletop can help students visualise different perspectives of the same topic and trigger discussions towards agreement on main ideas that describe the knowledge domain [4]. Collaborative scripts are set to drive groups of students to produce better quality concept maps, for example: the layout of concepts according to different theoretical principles.

Collaborative Poster Creation – designed for small groups to build a joint artefact from personal collections [2], consisting of an individual collection stage, and then collaborative stages of sharing and building. The collaborative stages have potential for scripting, for example: enforcing viewing of content – before being permitted to advance in the task.

Figure 1. Examples of tabletop applications used for exploring scripting.

Each activity, presents design issues to consider when formulating a set of guidelines to consider for scripting at the tabletop. These are: (1) People have different expectations and knowledge of the task at hand. (2) Voting/negotiation mechanisms – the way a group resolves issues. (3) The need for sound default settings. (4) Identifying group collaboration and how to show this to learners. (5) Whether the main task was executed as expected, and the role scripting had towards this.

We propose a set of guidelines: (1) Regulate learning activities [6] – keep "*activities of learners coordinated and guided according to particular rules, implemented via respective tools in the learning environment*" [5]. (2) Foster collaboration – organise the activity and the script to promote collaboration. (3) Facilitate egalitarian participation. (4) Define level of user control. (5) Foster awareness – develop an understanding of other participant actions. (6) Adjust the script based on information from the system and the users. (7) Use Tabletop Affordances – take advantage of the constraints introduced by the tabletop, such as: face to face discussion; and methods to exploit the hardware.

2 Suggested Topics for Discussion

- Whether script approaches at the tabletop should be system or role based or both?
- The representation of open learner models to aid in the scripting process?
- The appropriate level of feedback for learners? OLM's?
- Methods to help determine if a script is needed?

3 Biography

Andrew Clayphan is a Ph.D. student at the CHAI Research Group at Sydney University, Australia. He holds degrees in Software Engineering (University Medal, Honours Class 1) and Finance from the University of New South Wales, Australia.

Relevant Publications

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