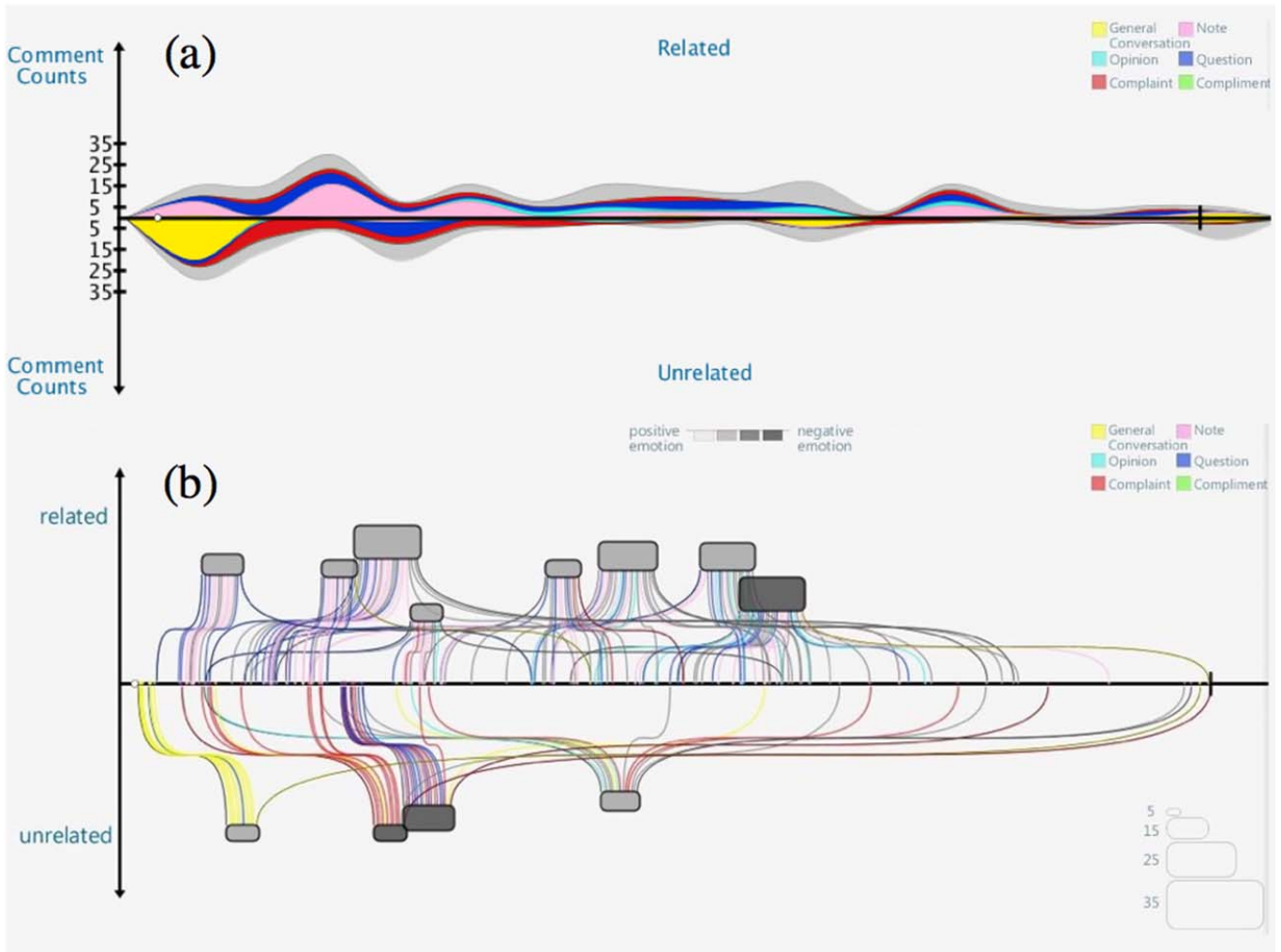# Supplemental Materials of

"Exploring Online Learners' Interactive Dynamics by Visually Analyzing Their Time-anchored Comments"

Visualizations of leaners' comments for neural science video

Figure 1. (a) ThemeRiver visualization (y-axis displays the values of course-relevance). Learners seemed to be more focused at the first half of the course as there are more note comments (pink color); however, at the beginning of the course, there are also lots of general conversations (yellow color). (b)ToPIN visualization (y-axis displays the values of course-relevance). There are several topic boxes containing complaints and general conversations, which facilitate further more detailed exploration of comments.

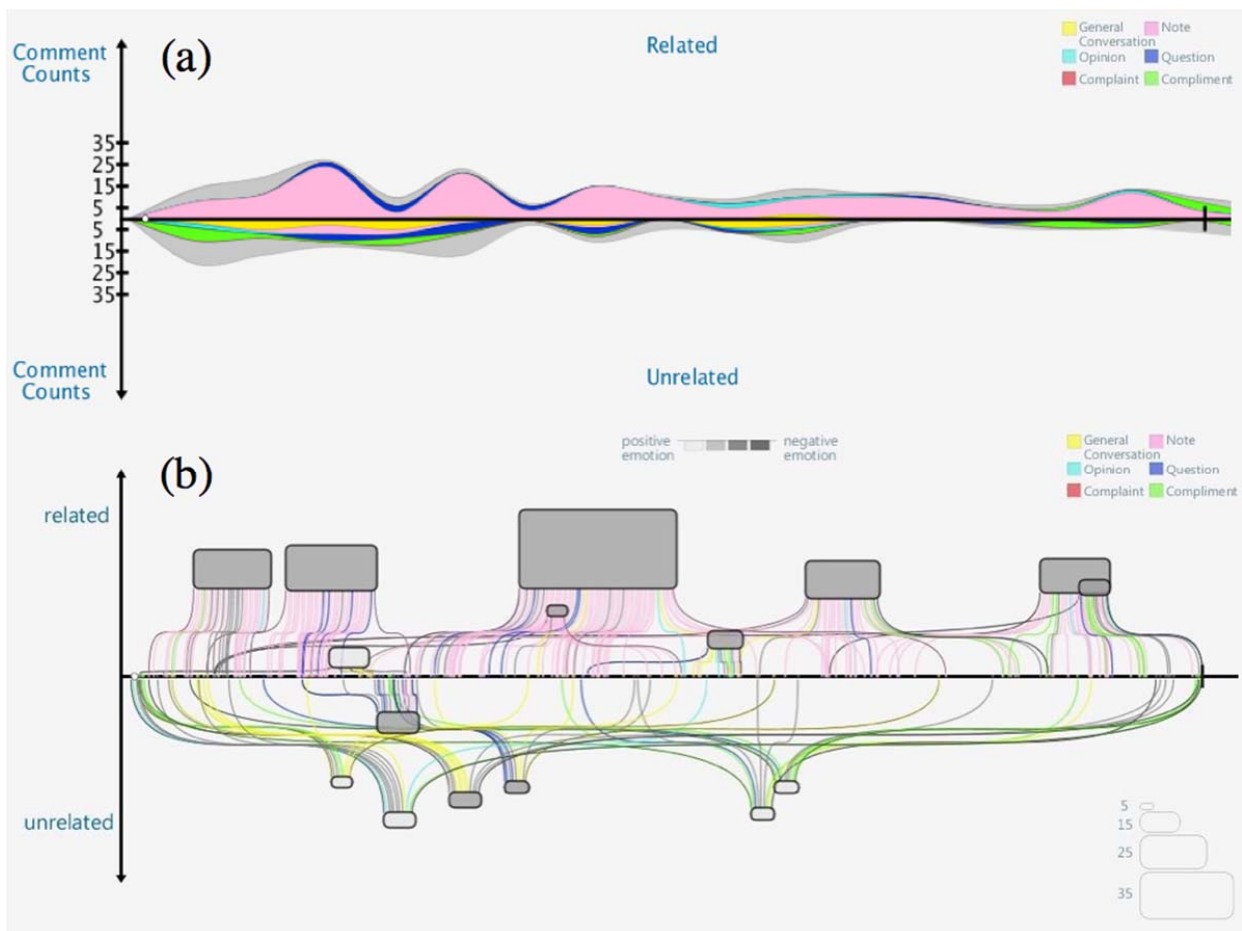**Visualizations of leaners' comments for economics course videos**

Figure 2. (a) ThemeRiver visualization (y-axis displays the values of course-relevance). **Learners kept taking notes (pink flow) throughout the lecture and there compliments at the beginning and end of the video. These might suggest that most learners were concentrated and satisfied with the lecture.** (b) ToPIN visualization (y-axis displays the values of course-relevance). ToPIN displays several big topic boxes containing many notes (pink curves). This might imply that the course contents are organized and easier for learners to follow. Several topic boxes containing compliments (green curves). This might indicate that learners were satisfied with the lecture.
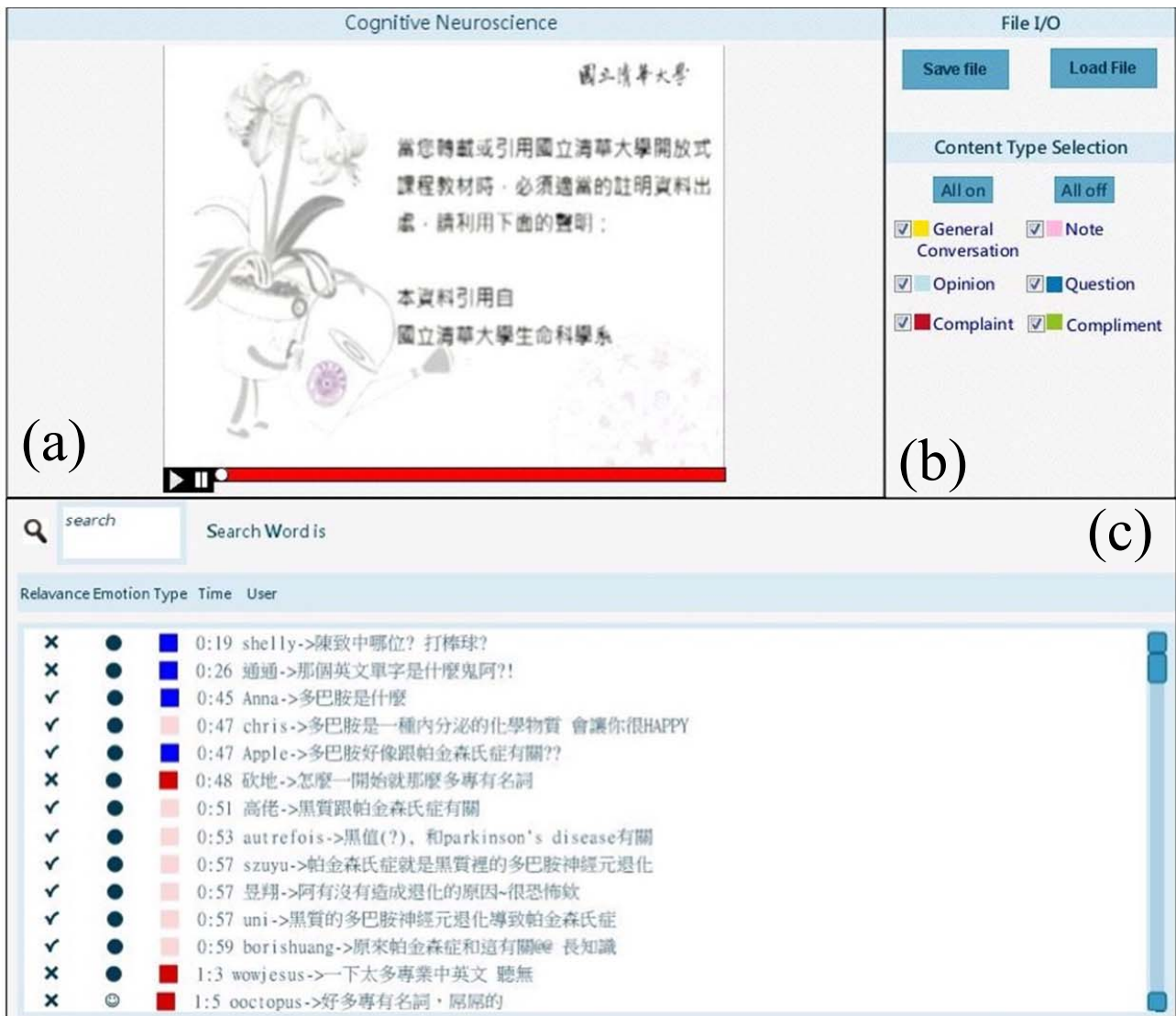
The interface of baseline condition in Study 2

Figure 3. (a)The video window, (b)The control panel. We provided the Content Type Selection to help users conveniently filter the leaners' comments., (c) The Comment window and analysis tags. In comment window, we added the tags of the results from our three analysis methods in front of each comments (whether related to the course or not, positive or negative emotion and different content types).