Enriching face-to-face and digital interaction with SpeakUp: challenges & lessons learned

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Abstract

Student-teacher interaction has often been recognised as an important aspect of learning, but creating such interaction is challenging. To aid this problem, we have designed SpeakUp, a mobile social media app to support social speaker-audience interactions, confined in time and space. Speakers can create temporary chat rooms accessible to a nearby audience, where one can post and rate messages. SpeakUp has been evaluated with over 700 users in three courses and one conference. This paper discusses some challenges we have encountered researching SpeakUp. We have identified several open research questions that can cultivate future research.

Author Keywords

temporary social media, context-aware mobile interactions, backchannels, digital humanities, education, learning

ACM Classification Keywords

H.5.2 [User Interfaces]: Graphical user interfaces (GUI).

Introduction

Does anyone have a question? This cue signals to many audiences that it is their turn to interact with speakers. Frequently, what follows is either an embarrassing silence, or a detailed exposé of someone's personal interests, potentially of little appeal to the rest. To encourage

questions and filter out the most interesting ones, some speakers augment the face-to-face (F2F) interaction with digital tools, such as Twitter or Reddit. Unfortunately, these systems lose the *here & now* nature of the F2F interaction and make conversations public and persisted. To augment the F2F interaction with its digital *here & now* counterpart, we have designed Speakup. SpeakUp is a temporary social media app that allows users to post and rate messages anonymously in nearby located chat rooms without requiring formal registration. We have evaluated SpeakUp in three courses and a conference setting with over 700 users [2, 3, 4], which allows us to report on lessons learned and future challenges that we are facing. This paper first presents SpeakUp concisely. Afterwards, the challenges encountered and lessons learned while designing and using SpeakUp are discussed. In conclusion, three general research questions are identified.

SpeakUp

Speakup[1] is a mobile, temporary social media app that provides anonymity, social rating and temporary geolocation-bound interaction. Once SpeakUp is launched a list of nearby rooms (200m in the user's vicinity) is displayed on the home screen (see Figure 1) without any log-in process. Via the '+' button, one can create a new room at one's location. When a user selects a room on the home screen, she can read its messages and vote by clicking the thumb up or down icons. For each message, the number of votes and the relevance score (i.e. the number of thumbs up minus the number of thumbs down) is displayed. Messages can be ordered based on score or publication time. Public display visualisations with latest and trending SpeakUp messages can foster awareness. More detail on the SpeakUp UI is provided in [3, 4].
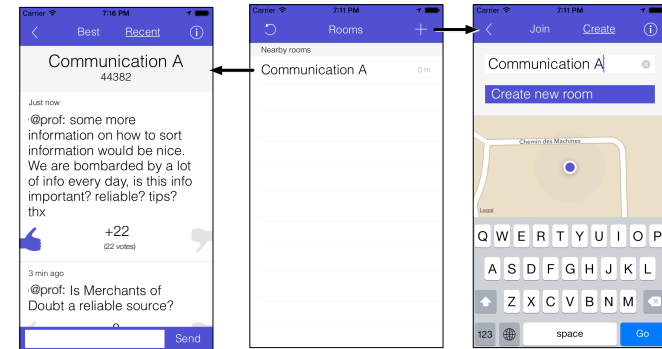

Figure 1: Screenshot of a SpeakUp

Challenges

This section presents challenges and open questions from our experience using SpeakUp in the wild.

Interweave digital and F2F interactions: Designing applications to collaborate in parallel within the app and F2F is often hard due to the difficulty to define the thin border where digital and F2F meet. Different collaboration protocols or the lack thereof can require a custom design and the user experience can be affected based on how digital and F2F communication is blended. During our evaluation of SpeakUp in a conference setting [4], the Q&A moderator did not take the SpeakUp questions well into account, upon which users complained. We have experience with other protocols (e.g. answering questions after each hour), but more data is needed to draw conclusions. Furthermore, digital communication can become more dominant and the value of being co-located decreases. Finally, it can be hard to consolidate digital interaction if various platforms are used, e.g. some are using SpeakUp and others Twitter.

Open questions: What should be done F2F, what online and when? How can several digital platforms coexist to support common F2F co-located interaction? How to interweave digital and F2F more effectively?

Improve participation: A general challenge of most collaborative apps is to involve more people, either co-located or geographically dispersed, into a collaborative activity. SpeakUp does this by limiting the setup cost, and providing anonymity and privacy. By limiting room access to co-located people, the log-in hurdle is eliminated and a sense of privacy created. The privacy is strengthened by posting and rating messages anonymously, and wiping rooms after 24h of inactivity. Our evaluations showed that this temporariness is much more valued by SpeakUp users than people without SpeakUp [4], while lecturers often would prefer to save the communication traces. Evaluation results showed that Speakup is increasing the participation when compared to students not using SpeakUp [4]. Another issue is that all views are often not represented [5] in F2F participation.

Open questions: How can participation become more representative? Does group size affect participation?

Handle information overload: Providing a digital collaboration platform next to F2F interaction can cause information overload since both information streams occur in parallel. Furthermore, SpeakUp's anonymity and temporariness can provide users a safety mask to post unrelated content and distracting messages. In our evaluations, we have seen such unrelated content popping up [2, 3, 4], which is often backchannel information (e.g. posting links to YouTube videos or informing students about other courses/parties). SpeakUp provides filtering mechanisms to combat information overload. However,

since backchannel messages can receive high scores, they can affect the ordering mechanism. Hence, some students complained about such noise, but when asked whether it should be removed, most students preferred to keep unrelated content [2]. Different mechanisms, both digitally and F2F, can be considered to deal with such messages (e.g. machine learning techniques). However, we believe that social rating techniques will be more appropriate, combined with innovative ordering strategies, e.g. taking message novelty into account [1]. On the other hand, our own experience shows that introducing F2F a SpeakUp etiquette that defines how SpeakUp will be used for collaboration often reduces noise dramatically. Furthermore, such etiquette could also encompass how the group will interweave the digital and F2F interaction.

Open questions: What are better filters for digital content that are relevant for F2F interaction? Which mechanisms can be used to reach consensus in a group interacting both digitally and F2F?

Find a balance between attention, distraction and awareness: Part of the information overload issues can be due to task and attention switching between digital and F2F interaction. For example, too much digital information can distract from the F2F conversation, while not being up to date on the digital interaction can cripple the F2F collaboration. Hence to encourage participation and limit information overload, one needs to design for an equilibrium between awareness and distraction by drawing attention to the digital interaction at the right time. To improve awareness and participation, we evaluated a public display visualising the SpeakUp message streams and its statistics, projected next to the lecturer's slides. However, the lecturer found it distracting since students were at times engaged with the public display and not the

lecture [4]. Further evaluations are needed to better understand the effect of the public display on awareness, distraction and participation. Push notifications were also considered to make the users aware of new or popular messages, but this also requires a balance between the timing, frequency and the reason of the push notifications.

Open questions: How and when can awareness cues be delivered most effectively? What is the effect of the SpeakUp public display on participation and awareness? What kind of information should it display?

Pick the right tool for the job: Another dimension to the attention challenge is *where* the information is delivered and created. 'Where' can be on which device or the physical location where the information is accessible. With the advent of wearable technology (e.g. smart watches or augmented reality goggles) and natural user interfaces (e.g. Microsoft Kinect), new platforms are available to support both awareness and content creation. For now, our SpeakUp efforts have focused on smart phones, tablets and large displays. However, we plan to research notification mechanisms on wearables. Our preliminary public display evaluation hints that the public display might create more backchannel activity, maybe due to its position next to the lecturer's slides.

Open questions: What are appropriate devices to create awareness or collaborative content? Where can public awareness cues be placed in a physical space and what should these cues show?

Conclusion
Supporting co-located interaction through social media is a promising research avenue. In this paper we have presented our experience with SpeakUp, a messaging board app that shares *here & now* characteristics of co-located interaction and proved to be effective in supporting speaker-audience interaction. Our research led us to identify several challenges that can be summarised in the following three open research questions about awareness, behaviour and collaboration: (1) Which mechanisms increase awareness of both digital and F2F interaction, while mitigating distraction? (2) What kind of nudges modify behaviour towards better and more representative participation in digital and F2F group interaction? (3) How to design for the convergence of collaborative interaction happening in virtual and real spaces? We want to discuss these questions in the workshop and will research them further in the near future.

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