

# Exploring Engaging Dialogues in Video Discussions

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## ABSTRACT

Learning from dialogues is a powerful pedagogy. Video-based and dialogic learning have become increasingly commonplace over the last decade and gradually evolve as one of the most popular teaching & learning strategies for modern e-learning (i.e. MOOCs). Identifying high-quality video dialogues is increasingly challenging because of the sheer number of video discussions being produced daily. In this paper, we explore online video discussions by considering both structural discourse of discussion and user interaction.

## Keywords

dialogue-based learning, video discussion, vialogue, engagement

## 1. INTRODUCTION

Learning from dialogues is a powerful pedagogy, which involves several diverse cognitive instructional strategies, such as self-explanation, scaffolding tutorial dialogues, group discussions and among others [1-2]. The juncture of ITS/AIED & Learning Science literature has successfully demonstrated that students can learn from a wide range of such dialogue-based instructional settings [3-6]. Recently, studies show an alternative instructional context by *learning from observing others learn* [3] and is considered as a promising learning paradigm [4] due to such paradigm addresses the major limitations on development time in ITSs & liberated the domains from procedural skills to less structured fields. However, less is explored is whether such paradigm can be successfully applied on discussions around videos or other multimedia, which is one of the most popular teaching & learning strategies for modern e-learning (i.e. MOOCs).

Video-based and dialogic learning are not only becoming increasingly commonplace as research over the last decade, but more importantly, discussing within a multimedia-rich environment creates a wide range of educational benefits [7-10]. Essentially, discussing around videos includes more complex interactions rather than having dialogues alone/among groups or merely performing video annotations. In addition, given the accelerated pace of online media generation and discussion around that media, identifying high-quality video discussions is increasingly challenging and important. In fact, the task requires

more than just text analysis. Interactions on video discussions tend to be more sophisticated than posts and replies on discussion forums. Much of the time spent on video discussions is with the video rather than static objects in traditional forums (i.e. reading a post, an article or an image and reflect by responding text). Moreover, users' engagement can be heavily influenced by the user interface and its associated process flow [11]. Therefore, in this paper, we attempt to address these challenges by exploring the engagement activities in video dialogues. The goal of this project is to model the rich user interactions and structural discourse of video dialogues for deeper inferences on users' engagement.

## 2. VIALOGUES: VIDEO DIALOGUES

Vialogues is a video-based discussion tool purposively devised for reflective adaptive collaborative learning. We provide a brief overview on the core features of Vialogues in Figure 1. Vialogues allows users to comment directly on specific portions of a video, as opposed to only posting comments on a discussion board that references an entire video. All the comments are *time coded* to a specific point in the video. Thus, the comments and related portions of the video can be mutually referenced. Detail design rationales were published in [9].

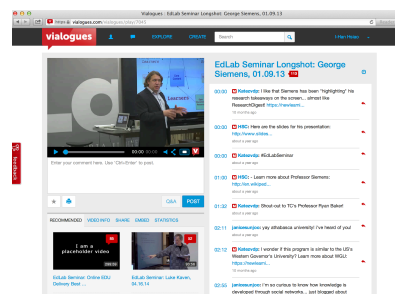


Figure 1. Vialogues, <http://vialogues.com>

Since December 2011, 3~5 vialogues have been featured on the Vialogues homepage weekly. At the moment of writing, there were 357 featured vialogues with a total of 3995 comments. Based on the reviewed literature, we selected three features to detect the most engaging comments from online video

discussions: 1) Comment Syntactic, including basic discourse structure: comment length (total characters), word counts, words per sentence and comment density, comment novelty, comment readability; 2) Comment Semantic, including comment psychometrics and comment sentiments and 3) User Interactions, including Vialogues moderation, user activity and user behavioral patterns.

### 3. EVALUATION

Our goal is to construct a generic model that can predict users' behavior based on the discussion structure, content and their interactions. To capture whether the observed assumptions on the features would account for the variation in engagement prediction, we performed logistic regression. Overall, the full model was able to successfully predict user behavior at  $F(1, 334) = 3.25, p < .001, adjusted-R^2 = 0.139$ . We tested the goodness of the models reserving 20% of the observations for testing with 10-fold cross validation ( $MAE_{10FOLD} = 2.59$ ) and selected a final model.

#### 3.1 Effects of Syntactic on Engagement

In predicting user engagement based on comment syntactic features, we found that *the relative position of the comment to the video* has a significant positive effect on user engagement. A possible explanation is that once a user starts playing a video, disregarding the video length, it is common to spend some time in the beginning getting oriented to the context and participate later. Such results provide very useful information for instructors or instructional designers to be aware of the natural tendency of "warming-up" phase of a discussion and can adaptively moderate discussions early on. We anticipated that the more novel words in the comments, the more engaged with the discussion a user might be. However, the results demonstrated otherwise. Possible reasons could be that new words or new information may be useful, but may also be distracting, losing user focus. Among other comment syntactic features, we see a tendency of less lengthy comments and slightly complex words tend to promote video discussion. Although these are not significant predictors of user engagement, we think the short and complex words phenomenon can be somehow attributed to the hashtags (#).

#### 3.2 Effects of Semantics on Engagement

Some online discussion literature has already suggested that discussions may remain at a surface level, such as sharing or comparing information, without diving into deeper levels [11]. To prove that the vialogues effectively promote meaningful discussion rather than surface level communications, we looked at the comment semantics. Based on the logistic regression model, we found that only cognitive words attributed significantly positive to users' engagement; perceptual and relative words negatively attributed to users' engagement, social and biological words were marginally negatively attributed to users' engagement; and emotional words (affection words or sentence sentiments) in the comments do not affect users' engagement. The results seemed to be counterintuitive to our understanding at the beginning; however, the results supported the design of vialogues to facilitate meaningful video discussions and appeared to be engaging when the comments are highly cognitive but not superficially conversational.

#### 3.3 Effects on User Interactions

We found that the number of moderators' comments, the number of views and the number of timecode clicks are positively and significantly attributed to the vialogues engagement. However, there were significant negative correlations among the number of

moderators, the moderation ratio, the number of vialogues were embedded and the number of vialogues being bookmarked as favorites. Such results revealed the importance on the comments quality instead of quantity. Meanwhile, users were found engaged with immediate interactions (*time-code* clicks to reference to specific video fragment and the comment) with the video discussions rather than *post-interactions* (such as favorite the vialogue or embedded it to elsewhere).

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