

# Searching through Videos: Scholarly Information Search of Native and Non-Native English Speakers on YouTube

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**Abstract.** Living in a visually rich environment, university students seek and consume information through videos to complete their academic tasks. This exploratory pilot study examines if and how students' interaction with the YouTube search engine will generate particular search experiences and outcomes on their search tasks, and how native and non-native English-speaking students may interact with the search system and the videos. It aims to explore possible patterns in the search behaviors and experiences of the two groups. One general exploratory information task and the participants' self-selected academic-oriented tasks were used for this study, both of which have been observed and analyzed along with follow-up interviews. Initial patterns have been observed in their behaviors within the search engine on their academic-oriented tasks. Limitations and suggestions for further development of the design of the research are discussed.

**Keywords:** Video-Based Information Search; YouTube; Non-Native English Speakers; Scholarly Videos; Exploratory Task; Information Seeking Behavior

## 1 Introduction

Information searching is based on many contextual factors such as user's goals, tasks and characteristics [1]. One aspect of the user's contexts yet to be studied is examining how the users' language backgrounds may impact search behaviors [2]. Studies suggest that most search users in world search in English as a second language to satisfy their information needs [3-5]. Especially for the non-native English speakers or "English as a second language" (ESL) students living in the United States, searching in English is often necessitated by their need to carry out daily activities in their English-speaking environments, including academic tasks. This study seeks to examine potential patterns that may be observed from the behaviors and experiences of the users of different linguistic backgrounds (i.e., native speakers and ESL speakers), especially as they search for videos for academic purposes. Some studies have examined the role of the users' language backgrounds on their web search behavior [2-6], but video retrieval systems have not been sufficiently evaluated from the user-centric view.

## 2 Research Statement

When users search for information in a foreign language, they may face additional challenges that may not be present for native language users [6]. Language-related characteristics may affect the performance of the user's search as well as relevance judgment of the results offered by the system [5]. While previous research have examined the user's cognitive efforts needed to perform their search, dearth of research literature exists on how ESL speakers perform their online search and satisfy their information needs through videos [2]. Since the purpose of this initial study is exploratory in nature, the following open-ended research questions guided the direction of the study:

- RQ1. How do ESL and native English speakers engage in scholarly information seeking, by interacting with system features and videos offered by YouTube?
- RQ2: What elements of the search results (e.g. title, thumbnails, video descriptions, preview images, view counts) are utilized by the participants?
- RQ3: What challenges do the participants experience as they interact with the video search engine?

## 3 Methods

### 3.1 Participants

A total of five university graduate students were recruited for this pilot study through convenience sampling. The participants were three ESL speakers and two native English speakers; three participants were female (two ESL) and two were male (one ESL). The participants were recruited based on the following additional criteria:

1. They must be graduate students studying in the disciplines of science and engineering, or business. This is to limit the participants' range of topic selection from their academic disciplines and control for academic subject areas.
2. For the ESL students, the total length of stay in the U. S. must be less than one year, and they must not have previous exposure to an English-speaking environment for an extended period of time.

The participants included two students from the business field, two from science and engineering, one from both business and science (i.e., Business and Science). The ESL participants were born in China, and all of them spent less than 10 months in the U. S. (average = 9 months). Their language proficiency reports in the 5-point Likert scale ranged from slightly well (2) to very well (4).

### 3.2 Procedure, Data Collection and Analysis

The total time spent to complete the study ranged from 60 minutes to 90 minutes. The study procedure included the following steps:

- [5 min] informed consent for IRB, guideline, background questionnaire
- [7 min] *Task 1*: timed task on general topic (i.e. technology trends)
- [10 min] Post-task questionnaire and follow-up interview

- [untimed – approx. 15 min] *Task 2*: exploratory task on academic-related topic (chosen by participants)
- [30 min] Post-task questionnaire and follow-up interview

**Data Collection and Analysis.** To address the three research questions, four sets of data were collected and analyzed based on the following categories:

- 1) User profile (questionnaire) – age, gender, academic backgrounds, language use and proficiency [7], search experiences, video searching, and familiarity with YouTube
- 2) User interaction with interface features (screen recording, observation) – total time spent, number and types of queries, videos opened/selected/saved, video watched/skipped, and use of features
- 3) Task representation (post-task questionnaire) – initial topic familiarity, level of difficulty, and level of satisfaction with the task
- 4) Post-session questions (interviews) – task-related intentions and experiences, challenges, actions, and overall experiences

For 2), each task search session was recorded using Camtasia v3.0.4, a screen capture software. For 4), the participants were asked to do a stimulated recall, as the screen recordings were played back to the participants and they were asked to articulate their thinking and their decision-making processes [8]. The semi-structure interviews were voice recorded and transcribed, and coded inductively based on thematic analysis since the nature of the research questions were concerned with developing concepts rather than applying pre-existing concepts [9-10].

## 4 Findings

Based on the analysis of the data initially gathered, the native and ESL groups showed differences in the following areas: time, videos viewed and saved, queries and support recommendations. Other areas such as challenges using YouTube appeared to be similar between the groups. The academic-oriented task exhibited more differences between the groups compared to the general task.

**Time.** The ESL group spent less time (53.3% less time) completing the academic-oriented task (untimed), compared to the native group. The average time that the native speaking group spent was 21' 4", and ESL group was 11' 14". The native speaking group also spent the most time viewing few selected videos with almost no interaction with the system features (e.g., browsing, previewing, skipping), compared to the ESL group who switched quickly between browsing, searching, and viewing videos.

**Videos viewed and saved.** The ESL group viewed and saved more videos than the native group. On average, the ESL group viewed 10 videos and saved 7.3 videos, while the native English-speaking students viewed only 5 videos and saved 3.5 videos.

**Queries.** While there was no evident difference in the total number of queries made, there were major differences in the use of query recommendation. The ESL participants used query recommendations to complete at least one of the two tasks assigned, while the native speaking participants used none for the both tasks assigned.

**System support recommendations.** When asked to recommend better ways to support the system users, the two native English speakers suggested making the actual terms of the video contents searchable through automatic subtitling via voice recognition. On the other hand, two out of three ESL participants suggested clearer and better organization of categories of videos for easier selection.

**Challenges using Youtube.** Overall challenges with the search engine experienced by the groups appeared to be similar. The biggest challenge was judging relevance on the videos represented on the SERPs, as well as the limited informational cues offered by the system that would help them make better judgments about what videos are relevant. The textual or visual informational cues available on the SERP or the video content page seemed to be insufficient for the participants to make efficient or proper video selections. This result could allow future research to consider how different metadata might be constructed to compare search environments of alternative video systems.

## 5 Limitations

A larger sample size is needed to confirm the initial observations made in this study; for future study, more refined hypothesis will be used for the experimental design with a larger sample. Also, more implicit measure of linguistic competence and refined behavioral measures needs to be explored. In addition, when asked about the use of YouTube for academic purposes, all native speaking participants reported that they did not search videos for academic purposes, while all ESL participants reported that they regularly searched for academic videos. This finding could be tested using a brief survey with a larger sample of students. Finally, all ESL participants in this study were Chinese students. Better representation in this group is expected in subsequent studies.

## 6 Conclusion

The aim of this research was to understand how the users with different language backgrounds engage with a video retrieval system to satisfy their academic-oriented information needs. No studies to the author's knowledge have been conducted to study the users' language backgrounds and their experiences associated with the use of a video search system. This study examined the participants' search-related behaviors and their perceptions using a video retrieval system, which is useful to illuminate potential opportunities and issues relevant to video retrieval systems for better user-centered design.

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