Journal of Documentation

Perceived self-efficacy and interactive video retrieval
Dan Albertson Boryung Ju

Received 9 September 2015
Revised 8 March 2016
Accepted 3 April 2016

Perceived self-efficacy and interactive video retrieval

Dan Albertson
University of Alabama, Tuscaloosa, Alabama, USA, and
Boryung Ju
Louisiana State University, Baton Rouge, Louisiana, USA

Abstract

Purpose – The purpose of this paper is to examine perceived self-efficacy of users within an interactive video retrieval context. The motivation for this research includes that understanding self-efficacy will provide insight on how potential users target resources and in turn promote and sustain use of retrieval tools and systems.

Design/methodology/approach – A survey method was employed. In total, 270 participants rated levels of perceived self-efficacy for successfully fulfilling different video needs if using a particular system. Perceived self-efficacy was explored quantitatively, both overall and across different potentially influential factors, such as topic type, topic familiarity, system experience, and system context. In addition, open-ended responses on the survey were categorized through content-analysis and subsequently analyzed using weighted frequencies.

Findings – Findings demonstrated significant associations between participants' perceived self-efficacy and different topical factors, including familiarity and topic type, and also system factors, such as exposure (or experience) and system context.

Research limitations/implications – User confidence is one belief or attitude about technology acceptance, with self-efficacy intersecting multiple factors related to initial and sustained use of technologies. Findings give researchers a look at users' preconceptions of interactive video retrieval situations, which, in turn, suggest positive implications for future research and design.

Originality/value – Video retrieval comprises considerations that are unique from other contexts due to the structure and physical makeup of video. However, until now, self-efficacy has not been directly examined in relation to video or according to several of the specific retrieval factors as explored in the current study, which is thus warranted.

Keywords Digital libraries, User interfaces, Information retrieval, User studies, Cognition, Video

Paper type Research paper

Introduction

Attitude is everything, as the old saying goes. People's attitudes and beliefs, generally speaking, are shaped by a variety of factors. Self-efficacy, for instance, is defined as one's internal belief of their own ability to perform and complete tasks by executing the necessary or appropriate set of actions. Further, social cognitive theory credits learning to situational observation and self-efficacy, which is, in turn, also derives through observation (Bandura, 1977). Therefore, self-efficacy is integral to social cognitive theory. Self-efficacy, as a concept, has been examined throughout a number of different contexts and situations and, in turn, shown to be related to human motivation factors such as self-esteem and expectation (Nahl, 1996; Compeau and Higgins, 1995). Contexts of technology, including their use and adoption by users, have incorporated the element of self-efficacy (Thong *et al.*, 2002).

Perceived self-efficacy extends the concept to incorporate self-rated (i.e. perceived) levels of one's own abilities to complete such tasks, whether positively or negatively, which in turn can influence subsequent decisions (Kurbanoglu, 2003). For example, variations in perceived self-efficacy can drive action (or course thereof), resulting

Journal of Documentation
Vol. 72 No. 5, 2016
pp. 832-857

0022-0418
DOI 10.1108/JD-09-2015-0109

emotions, expended effort and perseverance in problem solving, and thus final performance (Ren, 1999). Perceived self-efficacy, as the primary variable or measure of the current study, is many times operationalized and examined as preceding levels of confidence of task completion prior to actions to be executed as part of a given situation.

Interactive information retrieval (IIR) involves the examination of users' interactions, perceptions, judgments, and performances when interactively searching for information to satisfy needs. User-centered research in IIR has provided better understanding about the interactions and cognitive processes of users in IIR contexts, including leading up to, during, and after search sessions for different types of information. Moreover, prior studies have examined users' interactions throughout different IIR contexts, leading to understanding patterns and/or generalized approaches of how users search, browse, assess, and select information using user interfaces. The cognitive processes and criteria of users have also been analyzed to understand how users target resources, define and scope needs, and model search queries – within the confines of a system user interface – for ultimately applying to search. Many factors can influence both users' behaviors and cognitive states or statuses at all stages of an information seeking process, including those prior to an actual interactive search session, which can inform how IIR situations, involving systems, collections, and interfaces, can encourage and accommodate users. Further, findings from all areas of user-centered IIR research have helped inform designs of interactive tools, such as digital libraries, including collection access, retrieval functionality (RF), and user interfaces.

Interactive video retrieval is an IIR process as applied for seeking, finding, assessing, selecting, and using video information, specifically, in order to satisfy information needs and facilitate tasks that necessitate video. The makeup and structure of video information provides additional considerations and criteria for users and interface developers alike; users in the interactive video retrieval process will inevitably view, contemplate, and assess visual, audio, semantic (e.g. storyline), and time-based information (among others), which can be influential to use, information needs, retrieval, and user interface design (Albertson, 2013). The necessity of users having to cognitively manage different types and structures of information, as part of one search for video, sparks interest about the influences on users' perceived self-efficacy in a video IIR process. For example, user familiarity or understanding of the information needed in a search topic to facilitate tasks can vary across the different information types and structures embedded within video, e.g. users may be familiar with storylines within a video as opposed to particular visual content or physical aspects of needed video, which can be accommodated differently by IIR systems and thus be of possible influence on users' perceptions and confidence.

Prior research of perceived self-efficacy has been conducted from different technological contexts spanning basic technology use (Compeau and Higgins, 1995; Hill *et al.*, 1987; Karsten and Roth, 1998; Nahl, 1996) to IIR within certain academic or professional domains (Mansourian and Ford, 2007; Nahl, 1996; Ren, 1999). Although modestly, self-efficacy, and IIR have been previously examined in conjunction with one another for understanding how users rate their abilities and/or levels of confidence for fulfilling information needs to complete information-based tasks. Even more so, an intersecting element throughout separate factors pertinent to technology acceptance is that of self-efficacy, as it correlates to a variety of perceptions specifically about digital tools and systems, such as their ease of use and/or usefulness, relevance for certain tasks, anxiety with technology, and others (Compeau and Higgins, 1995; Hong *et al.* (2002).

Therefore, it is warranted to investigate perceived self-efficacy separately as a phenomenon in IIR due to its different types of interrelationships with other factors in the larger or more holistic models.

Considering how the video IIR process fundamentally comprises considerations of users that are unique from other contexts or types of information retrieval, it is warranted to separately assess users' initial perceptions of confidence, i.e. perceived self-efficacy, preceding an actual interactive process or session. Technology acceptance model (TAM) needs examination from video IR contexts/digital libraries – which has been conducted – the current study was developed to measure overall levels of perceived self-efficacy for fulfilling different types information needs (i.e. requests) for video, enabling comparisons across different factors pertaining to sample search topics and prior experience of potential users. Motivations for this research included how empirical understanding of self-efficacy in the context of video IIR will benefit the field, including analyzed measurements of specific potentially influential factors, which can ultimately provide insight behind how potential users target different resources and in turn sustain interest and use.

Research questions

Different factors can influence users' attitudes about employing technologies in order to perform information-based tasks. Users' perceptions and use of interactive video retrieval systems, such as digital libraries, are no different; there are existing influences. Even more so, there can be different considerations and factors potentially influential to users' confidence and eventual use of systems for performing video-related tasks that warrant assessment, including characteristics of the information needs, the retrieval system or tools themselves, and individual characteristics of the users. Furthermore, the influence of perceived self-efficacy in the IIR process in conjunction with the unique characteristics of video and video retrieval systems (i.e. user interface features) motivate the examination of the following research questions. The primary research questions are also further specified by corresponding sub-questions:

RQ1. What are baseline levels of users' perceived self-efficacy for finding video that successfully fulfills a video information need?

RQ1a. Further, are there variations in users' perceived self-efficacy across different user groups such as by age and/or gender?

RQ2. Are users' levels of perceived self-efficacy in interactive video retrieval influenced by the system context of their search?

RQ2a. Further, are there associations between users' perceived self-efficacy and their level of experience (i.e. current regularity of use) with a given video retrieval system or digital library?

RQ2b. Are there variations in users' perceived self-efficacy across the different individual systems as employed in the current study?

RQ3. Are users' levels of perceived self-efficacy in interactive video retrieval associated with different characteristics or factors of the need?

RQ3a. Are there associations between users' perceived self-efficacy and the type or nature of a video search topic, more specifically, collocation (recall) vs known-item (precision)?

RQ3b. Are there associations between users' perceived self-efficacy and the level of preceding familiarity with the general topic being searched?

RQ3c. Are there (multi-variable) associations between users' perceived self-efficacy and both the type of video search topic (*RQ3a*) and preceding knowledge of the general topic being searched (*RQ3b*)?

RQ4. Are users' levels of perceived self-efficacy in interactive video retrieval influenced by both system and topical factors, as combined?

RQ4a. Are there variations in users' perceived self-efficacy according to both level of system experience and preceding familiarity with the general topic being searched?

RQ4b. Are there variations in users' perceived self-efficacy according to combined factors of *RQ4a* and different topic types (i.e. collocation and known-item)?

Examining these research questions enable the separate assessment of how certain factors pertaining to information needs, topics, and potential users influence perceived self-efficacy for interactively retrieving video to complete information tasks.

Related research

A number of research areas contribute to the overall discussion and findings of the current study, including studies from psychology, information science, and video IIR. Each of these respective areas have reported research about the psychological effects and influences prior to tasks, situations, and behaviors, such as confidence, expectations of outcomes (of a given situation), and efficacy. It is important to review research from each of these areas to further support the appropriateness and significance of the current study.

Self-efficacy: actions and behaviors

Self-efficacy has been examined across different contexts and situations, including how people's perceived abilities for successfully completing tasks influence situational experiences and even eventual successes and/or failures (Pajares, 2001). Further, self-efficacy has been depicted as being different than an expectation of outcomes (Bandura, 1986, 1994), and it has been observed that people's beliefs are more influential than actual truths (Pajares, 2001). The prior research reviewed here looks at self-efficacy's influence on people's behaviors and the generalized contributing factors thereof; this research is directly related to the objectives of the current study in terms of how confidence levels of potential users facing a video IIR situation, comprising its own set of circumstances and interrelated factors, influence action, such as targeting, accepting, and selecting information resources to conduct information-related tasks (Delcourt and Kinzie, 1993).

Self-efficacy can influence outcomes related to people's perceptions, behaviors, and/or subsequent actions. A summary of Bandura (1994) by Billings and Macvarish (2010) describes how the state of self-efficacy can affect both cognitive and physiological function. The influences of self-efficacy derive from the effects of four factors (or dimensions), which include: the decision to accept (i.e. undertake) a task, the effort put forth and sustained for a task, mental states, which are, in turn, also affected by self-efficacy, and selections (Billings and Macvarish, 2010). These factors are particularly related to the goals of the current study. "Cognitive processes" of self-efficacy influence

whether or not people take on particular tasks, and one's level of self-efficacy provides the motivation for continuation at high levels of effort on tasks, even if setbacks have been experienced. Further, self-efficacy stimulates anxiety felt by those facing tasks and situations, which contributes to the actual selections of people, including what is chosen and what paths and actions are taken throughout.

There are also sources of self-efficacy, as previously discovered, which can coincide with users' confidence preceding a task. While sources of self-efficacy can be attributed to the observations, self-perception of physical and emotional effects, and social influences upon those facing such tasks, "mastery experience" within a given situation is widely considered the most significant factor affecting such phenomenon (Pajares, 2001). Further, people need to believe they can succeed in a given situation, which will then influence what they choose to do and even the ultimate outcomes (Billings and Macvarish, 2010; Pajares, 2001).

The relevant aspects of such prior research on self-efficacy relate directly to the choices and selections made by people facing tasks, which, for example, can also encompass users in an IIR situation selecting and acting upon tools attempting to fulfill information needs. The choices ultimately made by users, working through information-based tasks, can be influenced by underlying factors related to and deriving from confidence.

Self-efficacy: technology and information-related tasks

Self-efficacy has been examined across various contexts that encompass computing and/or use of technologies for completing various tasks, such as in an academic (or learning) settings and even information searches. Research on this topic, generally speaking, dates back to around the time when computers began to be more widely utilized in everyday life and work. In fact, the concept of technology acceptance, which is closely tied to the implications of the current study, also arose with the emergence of personal computers, predating the development of the World Wide Web.

Karsten and Roth (1998) measured levels of both computer self-efficacy and computer experience of students beginning a computer literacy course and tested the associations between them. Both variables, i.e. self-efficacy and computer experience, were also examined in conjunction with students' final performance, represented as "computer dependence" for course performance. Results demonstrated that computer self-efficacy of students was significantly associated to final course performance. Further, certain computer experiences, more specifically, the amount of prior exposure and type of use, were correlated to initial or preceding levels of self-efficacy among the computer literacy course students.

Another early study in this area was conducted to assess how both efficacy and expectations were related to people's decisions to use "advanced technologies" (at the time), as part of the process of technology adoption and acceptance (Hill *et al.*, 1987). Beliefs of self-efficacy contributed to decisions to use technology regardless of whether or not the perceived expectation of a technology was that it would produce a valuable or desirable outcome. Also, prior exposure or experience, as factors, not only influenced use, but, additionally, adoption of other related technologies, further signifying acceptance of technology (Hill *et al.*, 1987).

Use of interactive technologies has since been analyzed using self-efficacy as an underlying factor. For example, research in this area has been reported from the context of interactive games. Bekker and Eggen (2008) framed a discussion of users' motivation for playing simulation games around planned behavior and self-efficacy, which they depicted in this situation as users' beliefs of whether or not they could

achieve the desirable outcome or set of expectations (e.g. actually being able to play the simulated sport successfully). Similarly, self-efficacy was a basis for the Game Approachability Principles and was incorporated as a heuristic measure for examining the likelihood of game approachability among potential users (Desurvire and Wiberg, 2008). Interactive communication technologies, on the other hand, have also previously included self-efficacy as a factor pertinent to user participation in online communities (Lampe *et al.*, 2010).

Others studies have assessed self-efficacy more directly in line with the IIR context and specifically within search processes. Nahl (1996) discovered that different search and performance outcomes, including search durations, completions, and user satisfaction, were associated with the level of self-efficacy. Another study of self-efficacy as part of a search context for governmental informational, found that as levels of self-efficacy increased so did use of the digital sources (Ren, 1999). Moreover, users of government information possessing higher levels of internet experience, and thus self-efficacy in such situations, employed electronic networked resources at higher levels. There were additional influences on self-efficacy which were more environmental or situational, as opposed to psychological or physical, including access to resources, and individual as well, including variations across different demographics (Ren, 1999). Others studies also discovered evidence of the significance of demographics on search self-efficacy, such as gender, where female users rated lower levels for searching the internet, which ultimately resulted in lower capabilities and performances (Ford *et al.*, 2001). Mansourian and Ford (2007) went on to further examine attributions to successful and failed searches which were qualified to include perceived abilities (as internal factors).

Interactive video retrieval: individual differences of users

Interactive video retrieval research focusses on use-centered aspects of video retrieval situations. Users have been analyzed in terms of how they interactively seek video, many times while using a specific user interface or system context. Interactions of users have been examined sufficiently enough that it has been possible for previous research to depict common tactics exhibited by users of particular systems (Wildemuth *et al.*, 2010) and other generalized tendencies when facing situations with fluctuating factors (Albertson, 2013).

A number of studies have examined influences and variations within interactive video retrieval according to individual differences of users. An individual difference, in this case, refers to characteristics of distinctive users, whether it is prior knowledge, domain familiarity, search experience, demographics, or any other that varies from user to user (Marchionini *et al.*, 2006). The review of this research is significant; it highlights the importance of individual differences in a video IIR context and draws comparisons based on characteristics of people (i.e. users), which, in turn, are related to the study of self-efficacy. Even though user-centered research is less commonly examined and reported in the video IIR literature than in other IR contexts, there is still a base of literature that provides understanding of the users and influences on their actions, assessment, and use of video.

Researchers from the Open Video Project developed a framework for video digital library evaluation, which provides considerations and justification for different interrelated factors, including those encompassing information tasks and individual characteristics of the user(s) (among others) (Marchionini *et al.*, 2006). The evaluation of different types or designs of video surrogate, according to their individual effectiveness and preferences of users, was also central to the framework (Wildemuth *et al.*, 2003).

Prior user-centered research on evaluation is significant considering the existing influences, such as reviewed above, preceding an actual interactive session between a user and system, including, those involving individual characteristics of users, e.g. experience and expertise, search tasks, and system/interface designs. Further, self-efficacy can be influenced by deliberate design decisions, including video surrogates, and users' prior experiences and preferences (for video assessment purposes) should be considered in order to improve attitudes and, in turn, encourage and sustain use.

Influences of individual differences within actual interactive sessions or experimental situations with different users of video systems having information needs have been examined to observe variations among user interactions, performances, and satisfaction. Prior research showed that users' knowledge or familiarity of information needs, the level of difficulty of a given search, and video search topic structure were all significantly related to these measures in interactive video search experiments (Albertson, 2013). There have also been variations in interactions and perceptions (e.g. satisfaction) of users throughout an interaction process for video as reported across different demographics of users, including in gender, age, and work context (Albertson and Johnston, 2016).

Methods

A survey method was employed to collect data that pertain to users' perceived self-efficacy in an interactive video retrieval context. The current study did not conduct formal IIR experiments, but rather assessed users' (i.e. survey participants') perceived self-efficacy as part of a brief scenario-like survey, which presented a general topic along with two different (video) information needs and a system context, and then asked participants to rate their confidence level for being successful in finding the requested video in that particular situation. The survey and accompanying approaches to data collection and analysis will be further described throughout this section.

Survey

Two versions of a survey were created. The different versions could only be distinguished by the system (i.e. system context) employed as part of the situation in each, that being either YouTube or the C-SPAN Digital Video Library. One version of the survey assessed participants' self-efficacy for finding requested video if asked to use YouTube. The other version posed the same topic, video information needs, and (scaled) questions, but instead specified the C-SPAN Digital Video Library (not YouTube) as the system if used to find the requested video.

Both system contexts, i.e. YouTube and C-SPAN, are large commercial systems with sizable collections, and both demonstrated potential to likely garner research data capable of examining the variables and factors pertinent to the research questions, including any influences caused by system context, e.g. levels of prior exposure of the tool, and/or characteristics of the search topic. YouTube served as a system context that most potential participants would identify with and thus perhaps garner insights about perceived self-efficacy within general video searching. The C-SPAN Digital Video Library was selected for the survey, as it also is recognizable commercial video digital library with a large collection of content of interest to many (as a result of the C-SPAN cable network); however, it also contains specialized video coverage intended for certain users with knowledge of specific areas of governmental or public affairs. These factors would help garner variability among study participants, in terms of levels of exposure to the system context and interest in the content coverage (i.e. topic comprising

the video information needs of the given survey). Further, providing such different system contexts was significant for application of the different contributors of self-efficacy, as discovered in the larger body of psychological and educational research, such as people's perceptions of being successful in similar contexts in the past.

A screengrab of each homepage – with visible search features – of the system context (i.e. YouTube vs C-SPAN) was embedded in each respective survey in order to help participants reflect further on the information need situation and conjure up past experiences. Further, again, no experiments that entailed actual use of each system context was conducted in the current study, rather this approach enabled the collection of initial reactions or perceptions from potential users. The screengrab of each system – provided in the different survey versions –had some overlapping visible search and browse features – with the homepage being the entry point to the collection – including a keyword search and various browse categories either pertaining to social classification (in YouTube) or according to the qualities of the C-SPAN television programs. However, the fact that different system contexts were employed in separate versions of the system – even though showing similar search features on each homepage – enabled the examination of important factors familiarity. Further, the systems were used not to test according to available/existing certain video retrieval interface features, but on other factors like users' familiarity and/or experiences.

On both versions of the survey, participants were first asked to rate their current level of use of the video system context of the survey, i.e. either YouTube or C-SPAN Digital Video Library, on a scale from 1 (never used before) to 5 (daily use). Beyond the varying system contexts presented, as described here, the survey versions themselves thereafter were the same including:

(1) Participants rating their level of familiarity with the same general information topic of "how the Chief Justice of the Supreme Court ruled on 'Obama Care' " on a scale of 1 (absolutely no familiarity) to 5 (expert on topic).

(2) Participants separately rating their level of confidence, analyzed here as perceived self-efficacy, for successfully fulfilling two video information need statements including:

- "An unedited video of the Chief Justice of the Supreme Court discussing his ruling on Obama Care during a college campus interview," coded for the current study as a known-item (or precision) video search.
- "Many video clips of political analysts critiquing the Chief Justice's ruling on Obama Care," designed as a collocation (or recall) search.

The design of these video information need statements (i.e. search topics) was careful and deliberate with the goal of incorporating general (e.g. topical) criteria in conjunction with others which were specifically pertinent to video information. The topical components of the information need statements were designed to invoke elements of topic knowledge or familiarity into the survey, e.g. who is the chief justice, what was his decision on "Obama Care." The components of the search topics designed more according to the contents/makeup and structure of video, as an information resource, specified such things as visuals (e.g. a "college campus" and talking heads) and aspects having to do with video editing. The approach to deliberately designing information need statements for the survey strived to place participants in a realistic situation in order to allow them to contemplate and rate perceived self-efficacy when facing different factors/aspects all of which are potential in an actual interactive video retrieval context.

Participants rated their level of confidence, i.e. perceived self-efficacy, for fulfilling these video information needs if while using either YouTube or C-SPAN Digital Video Library, which ever was presented as the system context in their respective survey. Further, the survey design and data collection method would enable quantitative comparison across different factors, spanning users and video needs and search topics, as potentially significant to self-efficacy based on prior research (Bandura, 1986).

A final question was posed on the survey to gather participants' open-ended judgments on why, i.e. the reasons behind, their rated level(s) of confidence on fulfilling the information needs. The purpose of an open-ended question was to provide data to supplement and potentially support results emerging from the quantitative analyses.

The survey itself was piloted before formal data collection to examine where potential points of clarity may be needed.

Data collection

For the most, paper surveys were collected; however, a small number of surveys was sent and received through direct e-mail. As previously stated, all individual participants completed one (and only one) version of the survey; no participant was given both. The result was a total of 270 surveys collected across the two groups or versions, with an equal number of 135 of each of the YouTube and C-SPAN Digital Video Library surveys.

Study participants

No particular type or group participant was targeted or recruited specifically for inclusion in the current study; the goal was to assemble – as much as possible – a sizable yet evenly distributed group of participants from different backgrounds. As previously stated, study participation (i.e. survey collection) took place both on and off campus at a major university with a handful of surveys being collected through direct e-mail, which strived to reach further participants from a different age groups. A total of 270 unique participants took part in the study, including 135 within both the YouTube and C-SPAN Digital Video Library groups. The overall participant sample is further reported according to frequencies among both age and gender, in Figures 1 and 2.

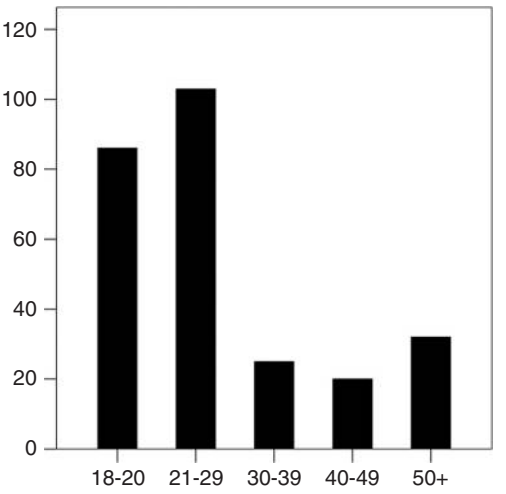

Figure 1.
Number of participants by age group

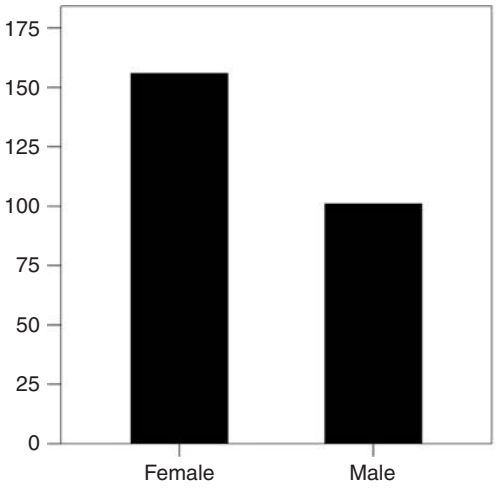

Figure 2. Number of participants by gender

The ultimate sample of participants of the current study demonstrates representation throughout gender and different age groups. Due to heavy recruiting on a college campus, a result of convenience sampling, there is an apparent concentration of participants within the earlier (i.e. younger) age groups. However, upper groups are also represented, having assembled a sample size of 270 in total. Similarly, both females and males participated in the study, with larger numbers of female participants overall. The variation in both age and gender, within the different (YouTube and C-SPAN) groups of participants, was fairly similar and reflective of the distribution of the participant sample overall.

Data analysis

Survey responses were analyzed quantitatively to examine the research questions of the current study. Descriptive statistics were first computed to assess participants' self-rated confidence, i.e. perceived self-efficacy, for successfully completing the information needs of the survey using the system context of their respective survey. Mean levels of perceived self-efficacy were compared between different groups, including between groupings by participants, topics, and systems. Correlation analyses were performed for assessing relationships between different scaled variables (e.g. self-efficacy and rated levels of system exposure and reported level of topic familiarity). Multiple regression analyses were also computed to examine variables pertaining to users, topics, and system together to further test the combined effects on variability of perceived self-efficacy.

Open-ended responses on the survey were analyzed through a two-step process. A total of 452 (YouTube 244; C-SPAN 208) open-ended responses were contributed by participants to the survey. First, the primary researchers of the study combined and collated the open-ended response items and worked independently to categorize them. For example, responses "knowledge of how to use 'search engines,' " and "I have a lot of experience using computer databases" were grouped together, and, likewise, so were examples such as "not familiar with ruling" and "I would be less successful in finding a video due to my lack of knowledge on the subject" (results of the open-ended responses will be provided next). These lists or "themes," as constructed, were compared and

reconciled through discussion, resulting in the five primary categories which were capable of being utilized for the purposes of coding and handling all individual responses. The resulting categories included:

- experience with the provided system (context) of survey;
- perception of the provided system (context) of survey;
- recognition of existing features on interface;
- self-perception of possessing relevant skills; and
- topic and domain factors.

With this list of categories, the authors independently assigned a coding number (i.e. category) to each response items. Out of 452, 28 (YouTube 20; C-SPAN 8) responses were invalid or out of the context and thus discarded from the coding process. The agreement rate (consistency) between the two coders was 84.7 percent. In the second step, weighted frequencies were calculated for each category in order to measure what key concepts study participants perceived as the most important for self-efficacy during their interaction with a specific (video) system context provided to them. Weighted frequency was calculated on the basis of the occurrence of each item across the total number of an individual participant's (e.g. maximum of three) words or phrases to the question. For example, if a participant generated three response items, then each of the three was counted as one-third (0.33). Weighted frequencies reflect more accurate measurement that simple frequencies in terms of equality.

Results

The analyzed survey responses provide findings and evidence about users' perceived self-efficacy while facing an interactive video retrieval situation. Results of the current study successfully demonstrated significant relationships among the variables examined as being potentially influential to users' perceived self-efficacy. The results and corresponding findings from this analysis will be presented in turn, according to the posed research questions (*RQ1-RQ4*) and sub-questions of the current study.

RQ1

Considering this is the first study about perceived self-efficacy from an interactive video retrieval context, *RQ1* was posed to garner baselines levels, including overall and across different demographic groups of the participants. Overall, the combined mean (average) of participants' perceived self-efficacy for successfully finding video that fulfills both video information need statements across the two different system contexts was 3.22 (out of 5), with a range of 4 (min. 1-max. 5) and a standard deviation (SD) of 1.11. *RQ1a* examines other more-specific baselines of participants' perceived self-efficacy including across different age and gender groups.

RQ1a. First, the mean (average) levels of participants' perceived self-efficacy, combined from both information need statements (i.e. search topics) of the survey, are presented across different age groups in Figure 3.

These levels of perceived self-efficacy by age produced a range from 2.80 (low) for the 50 and up participants to 3.83 (high) from the 40-49 group. Averages for other age groups are depicted in Figure 3, with exact means and standard deviations for each group provided numerically in Table I.

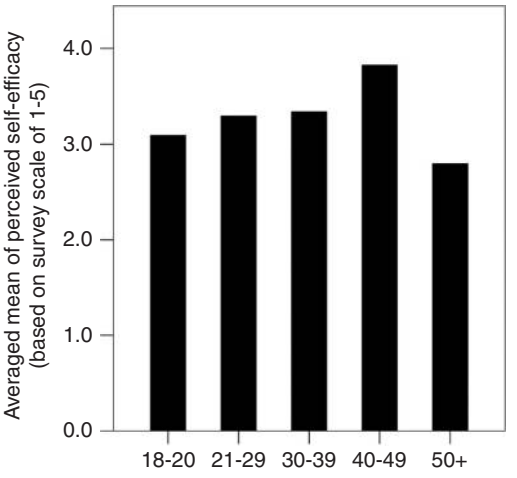

Figure 3.
Levels of perceived self-efficacy across different age groups

Age group	Mean perceived self-efficacy (combined across both topics)	SD
18-20	3.10	1.09
21-29	3.30	1.06
30-39	3.34	1.20
40-49	3.83	0.99
50+	2.80	1.17

Table I.
Descriptive results of perceived self-efficacy across age groups

Means of perceived self-efficacy between different age groups were also compared using ANOVA; results indicated a significant variation overall at ($F(4,261) = 3.22$, $p = 0.013$). Tukey *post hoc* analysis was subsequently conducted, which demonstrated that one statistically significant difference ($p = 0.01$) existed between the fourth (40-49) group and the fifth (50+) age groups. (The means and standard deviations for these two age groups, which were statistically different, are found in Table I).

Levels of perceived self-efficacy between different gender groups were compared as part of the next general/first-level analysis of the current study, as part of *RQ1*. Combined averages of participants' perceived self-efficacy by gender is presented in 4. Further descriptive statistics of these levels by gender include the female group at $M = 3.09$ and $SD = 1.04$ and male participants averaging $M = 3.34$, $SD = 1.17$ (Figure 4).

To test the significance of the variation in perceived self-efficacy among the gender groups, an independent *t*-test was computed; results of the test was $t(255) = -1.77$, $p > 0.05$, demonstrating a statistically insignificant difference or variation between the female and male users.

RQ2

RQ2 examined participants' self-rated levels of perceived self-efficacy in association with various factors related to the video retrieval system, including current level of use (i.e. experience/exposure) and the specific system contexts employed in the survey of the current study.

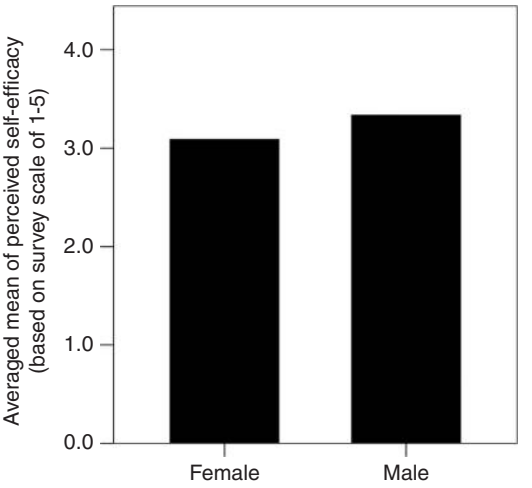

Figure 4.
Levels of perceived self-efficacy across different gender groups

RQ2a. The first sub-question of *RQ2* examined variations or associations of perceived self-efficacy with participants' reported level of current system use, which they rated on the survey using a scale of 1 (never use) to 5 (use daily). The averaged means of perceived self-efficacy, i.e. combined from both the collocation and known-item information needs of the survey, are presented across these increments of current system use (1-5) in Figure 5. Descriptive scores, including both means and standard deviations, at each of the levels of current system use are reported in Table II.

These averaged levels across system use, as shown in Figure 5, appear to be positively related, rising as system exposure increases. Therefore, a correlation analysis was conducted to further test this association, corroborating the relationship with a statistical significance between the two variables at $r = 0.40$, $n = 270$, $p = 0.00$.

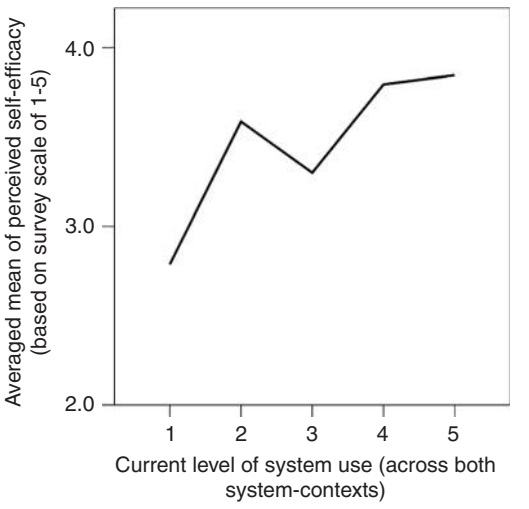

Figure 5.
Levels of perceived self-efficacy across self-rated levels of system use

RQ2b. The second sub-question posed to examine perceived self-efficacy in association with factors of a (video retrieval) system, looked at influences or variations across the actual different system contexts employed in the survey, i.e. YouTube and C-SPAN. This analysis was expected to coincide with results from preceding sub-question, i.e. across levels of system use, as participants' experience with the different systems (Figure 6) was significantly different ($t(268) = 19.38$, $p = 0.00$). Further, the overall level of current use of YouTube among the participants averaged 3.53, with a range of 4 (1-5) and SD of 1.27, compared to that of the C-SPAN Digital Video Library at $M = 1.18$, a range of 4 (1-4), and SD of 0.61. However, despite the stark differences among the current use of the two systems, comparisons were still performed because they entailed different contexts deliberately selected and employed as part of the survey design – to examine the research questions of the current study – and such an analysis enabled direct contrasts between different actual existing systems.

Variations among the levels of perceived self-efficacy between both groups were tested using an independent samples *t*-test. The result of the *t*-test was $t(268) = 4.58$, $p = 0.00$, verifying that YouTube participants, who demonstrated higher levels of current system use, rated statistically significant higher scores of perceived self-efficacy ($M = 3.52$; SD = 1.02) compared to those completing the C-SPAN survey ($M = 2.92$; SD = 1.11). See Figure 7 for mean comparisons.

Table II. Descriptive results of perceived self-efficacy across different levels of system use

Current level of use of system	Mean perceived self-efficacy (combined across both topics)	SD
1	2.79	1.09
2	3.59	0.99
3	3.30	0.74
4	3.80	0.93
5	3.90	1.05

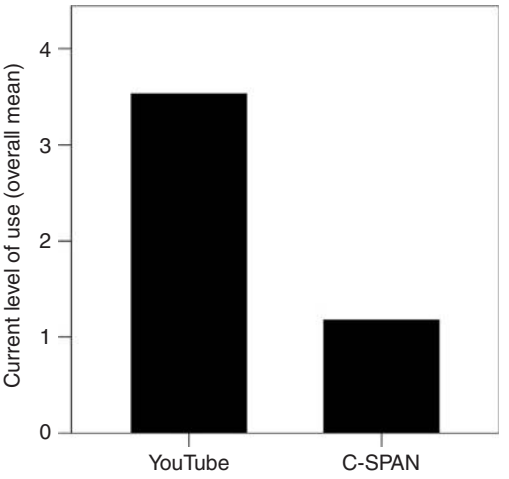

Figure 6. Self-rated levels of current use of different system contexts

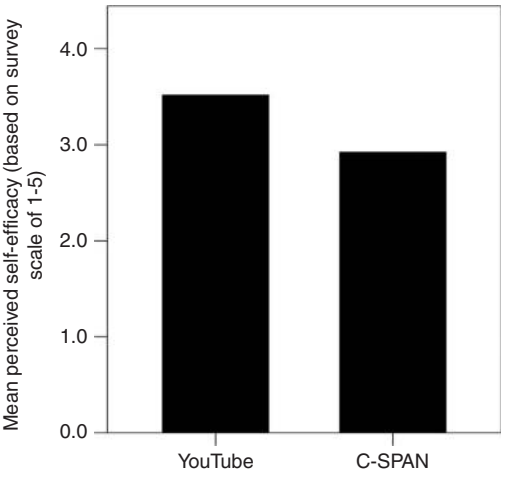

Figure 7.
Levels of perceived self-efficacy across different system contexts

RQ3

The third research question of the current study was posed to examine perceived self-efficacy in conjunction with different factors or variables pertaining to a search topic, the video information need statements on the survey.

RQ3a. The first aspect or characteristic of a search topic examined in terms of its influence on users' perceived self-efficacy was the type or nature of an information need which pertains to a video search task. Moreover, participants' levels of perceived self-efficacy for both the collocation (recall) and known-item (precision) video information needs were tallied and compared. These levels (along with the combined average of perceived self-efficacy of the two) are presented in Figure 8.

Descriptive results between the different types of video search topics included a mean of 3.30 and standard deviation of 1.15 for the collocation (recall) need, while the known-item (precision) need was measured at $M = 3.15$ with a SD = 1.19. Despite there

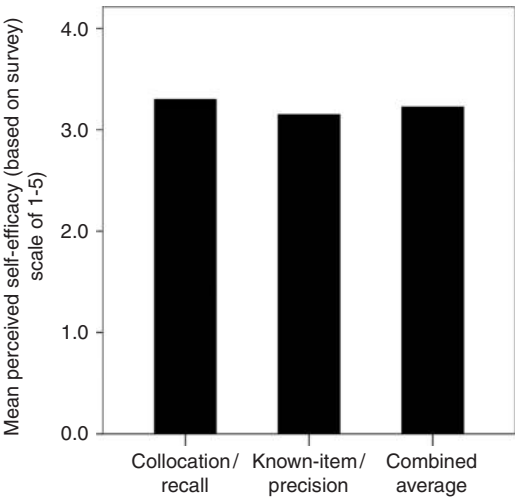

Figure 8.
Levels of perceived self-efficacy across the different types of video information needs of the survey

not being a sizable difference among these mean scores for the different topic types, a paired sample *t*-test demonstrated a significant variation at $t(268) = 3.26$, $p < 0.01$.

RQ3b. The next analysis regarding the influence of topical or need-related factors on perceived self-efficacy incorporated participants' levels of topic familiarity (e.g. existing knowledge of a topic) pertaining to the video information needs of the survey. The overall mean familiarity with the general information topic at the center of the study, "how the Chief Justice of the Supreme Court ruled on 'Obama Care,'" which was incorporated into the individual video needs of the survey, was 2.30 with range of 3 (1-4) and SD of 0.92. Participants' familiarity with this topic was assessed on the survey using a scale of 1 (absolutely no familiarity) to 5 (expert on topic). No one out of the entire 270 participant pool identified as a 5 – expert on topic.

The averaged perceived self-efficacies at the different levels of topic familiarity (i.e. the groups of participants identifying at 1-4) are depicted in Figure 9, with exact descriptive scores reported in Table III. Results (Figure 9 and Table III) certainly suggest a potential positive relationship between topic familiarity and perceived self-efficacy, therefore, a correlation analysis was performed which indeed confirmed a positive and significant association at $r = 0.178$, $n = 270$, $p < 0.00$.

Considering that no single participant self-identified as a 5 "expert of the topic," a second-level analysis between topic familiarity and perceived self-efficacy compared levels among the groups of participants identifying at the low end of topic familiarity, 156 of the 270, with those at the higher levels (3-4), i.e. the other 114 participants.

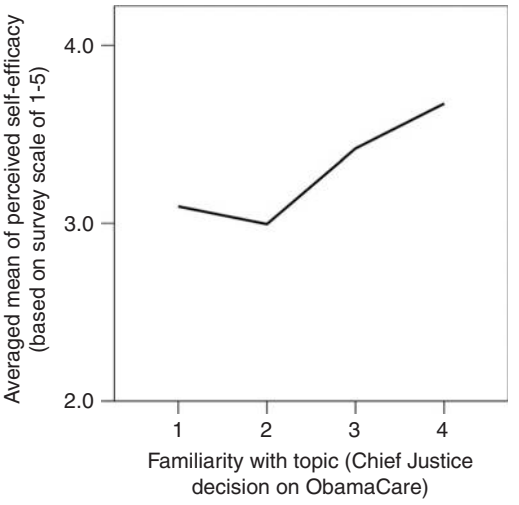

Figure 9.
Levels of perceived self-efficacy across participants' self-rated levels of topic familiarity

Topic familiarity	Mean perceived self-efficacy (combined across both topics)	SD
1	3.10	1.37
2	3.00	1.02
3	3.42	0.98
4	3.67	1.01
5	No participants	No participants

Table III.
Descriptive results of perceived self-efficacy across participants' self-rated levels of topic familiarity

Results showed a mean of 3.48 (SD = 0.99) for the 3-4 level group, i.e. those more familiar, compared to the overall mean of perceived self-efficacy of those less familiar with the general topic (in the 1-2 group) at 3.03 (SD = 1.16). As expected, an independent samples *t*-test showed significantly higher levels of perceived self-efficacy among the more familiar group at $t(154) = 3.33$, $p < 0.01$.

RQ3c. The analysis just presented was then expanded to specifically examine variations in perceived self-efficacy across different levels of topic familiarity in conjunction with the different topic types developed and employed as part of the survey. Further, mean levels were examined according to different topical factors including topic familiarity but also the collocation and known-item search tasks of the survey. Results from this analysis are shown visually in Figure 10 with specific scores in Table IV for the collocation (recall) topic and Table V for the known-item (precision) topic.

The relationships among topic familiarity and topic (video need) type with perceived self-efficacy was also examined via correlation analyses. While users' perceived self-efficacy of both individual topic types produced a positive relationship with topic familiarity, as expected, the collocation (or recall) topic type demonstrated a stronger relationship at $r = 0.203$, $n = 269$, $p < 0.01$, compared to the known-item search at $r = 0.132$, $n = 270$, $p < 0.05$. This trend further demonstrated that the stronger positive

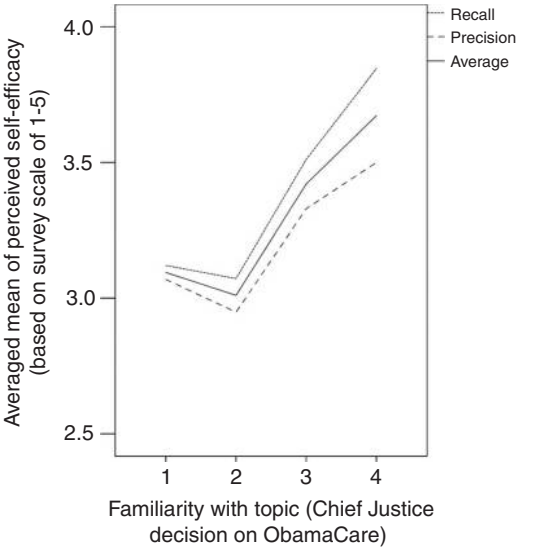

Figure 10.
Levels of perceived self-efficacy of the collocation and known-item search topics, and the average between them, across participants' self-rated levels of topic familiarity

Table IV.
Levels of perceived self-efficacy with the collocation video need across participants' self-rated levels of topic familiarity

Topic familiarity (collocation topic)	Mean perceived self-efficacy (combined across both topics)	SD
1	3.12	1.37
2	3.07	1.01
3	3.51	1.07
4	3.85	1.08
5	No participants	No participants

correlation between topic familiarity and the colocation topic type, as shown in Figure 10, was more positive particularly as topic familiarity increased into the upper levels (3 and 4).

RQ4

The final research question of the current study garners understanding of how both topical and system-related factors together influence perceived self-efficacy. *RQ4* was posed to conduct a combined analysis on the research data pertaining to the two preceding research questions.

RQ4a. The first analysis examined the effects on perceived self-efficacy according to levels of system exposure (i.e. experience or current regularity of use) together with preceding familiarity of the general topic being searched for within video.

Table VI provides the results of multiple regressions, depicting the statistical relationships of different types of factors in the current study, including both system exposure (current use) and topic familiarity, as combined, with perceived self-efficacy. An R^2 level of 28 percent explains the portion of variability of these two factors (system exposure and topic familiarity) on perceived self-efficacy. This regression model was shown to be valid ($F = 28.787$, $p < 0.001$), and results showed that system exposure ($\beta = 0.274$, $p < 0.001$) and topic familiarity ($\beta = 0.197$, $p < 0.05$) significantly affect self-efficacy.

RQ4b. The final research question (and sub-question) of the current study expands the preceding analysis (*RQ4a*) to also include the different types of video information needs (e.g. recall and precision searches) as part of a combined examination of the influences and effects on perceived self-efficacy. This relationship was also measured using a multiple regression. Here, for this analysis, 18 percent of the variability in perceived self-efficacy is explained by the three combined factors (system exposure, topic familiarity, and type of information need) ($R^2 = 0.183$). In this regression model ($F = 19.720$, $p < 0.001$), only system exposure ($\beta = 0.263$, $p < 0.001$), and familiarity

Topic familiarity (known-item topic)	Mean perceived self-efficacy (combined across both topics)	SD
1	3.07	1.50
2	2.95	1.11
3	3.33	1.03
4	3.50	1.07
5	No participants	No participants

Table V. Levels of perceived self-efficacy with the known-item video need across participants' self-rated levels of topic familiarity

Model		Unstandardized coefficients B	SE	Standardized Coefficients β	t	Sig.
1	(Constant)	2.121	0.188		11.263	0.000
	Usage	0.274	0.040	0.382	6.880*	0.000
	Familiarity	0.197	0.067	0.163	2.930**	0.004

Notes: $R^2 = 0.177$, adjusted $R^2 = 0.171$, $F = 28.787$ ($p < 0.001$). *$p < 0.001$; **$p < 0.05$

Table VI. Results of multiple regressions among system exposure (i.e. current use), topic familiarity, and perceived self-efficacy

with the general topic to be searched ($\beta = 0.199$, $p < 0.05$) significantly affected perceived self-efficacy, awhile the effect of topic type did not demonstrate a significant association (see Table VII). Further, including topic type (recall vs precision) into the multiple regression model lowered to level of influence or effect on perceived self-efficacy from that of the above analysis (*RQ4a*) which included only topic familiarity and system exposure (or current level of use).

Results of open-ended comments

Additional insight into users' perceptions of their experience, in accordance with the variables being tested in the current study, emerged through analysis of the open-ended responses contributed to the final question of the survey. Results are presented in Table VIII which shows the weighted frequency levels of the primary categories developed for coding individual responses from participants. The categories, based directly on responses of participants, mostly aligned with the variables examined as being associated with perceived self-efficacy.

Results emerging from this analysis (Table VIII) intersect with multiple research questions explored in the current study, such as the influence of both system factors and video topics, providing further perspective into the variables being tested. Given the weighted frequencies for the different categories, the level for each category, rank-wise, can be deduced from the results in Table VIII; how these categories and levels support specific research questions will be presented in the following discussion section.

Table VII.
Results of multiple regressions among system exposure (i.e. current use), topic familiarity, topic type, and perceived self-efficacy

	Model	Unstandardized coefficients B	SE	Standardized coefficients β	t	Sig.
1	(Constant)	1.906	0.250		7.611	0.000
	Usage	0.263	0.041	0.367	6.472*	0.000
	Familiarity	0.199	0.068	0.163	2.934**	0.004
	Topic type	0.073	0.057	0.073	1.291	0.198

Notes: $R^2 = 0.183$, adjusted $R^2 = 0.173$, $F = 19.720$ ($p < 0.001$). *$p < 0.001$; **$p < 0.05$

Table VIII.
Weighted frequencies of categories according to number of open-ended survey responses along with provided examples

Categories	Example responses from study participants	Weighted frequencies YouTube	C-SPAN
Experience with the provided system (context) of survey	"I've never used C-Span Video Library"; "I know how YouTube works"	19.37	22.08
Perception of the provided system (context) of survey	"The system is cumbersome to use and the results are far less than a similar Google Search yields"; "You can find anything on YouTube"	15.26	7.79
Self-perception of relevant skills	"general knowledge of search techniques including Boolean search"; "I am a Library professional"	23.85	27.03
Topic and domain factors	"General Knowledge of 'Health Care' "; "Knowledgeable on subject"	27.03	23.66
Recognition of existing features on interface	"The website has a clear search bar"; "The drop down box helps me narrow down my search"	7.97	3.98

Discussion

Perceived self-efficacy is significant for video IIR design, development, and evaluation, as user confidence can ultimately be a factor influential to initial and sustained use of technologies, tools, and digital collections. Furthermore, if users are not certain a given tool can help satisfy information needs and/or that its design can be accommodating to individual situations, inclinations to use such a tool may decline. User uncertainty (among other variables) is one attitude about technology use and ultimate acceptance, with self-efficacy being influenced by perceptions of usefulness and ease of use (Davis, 1989).

This initial examination, as part of ongoing research, demonstrated that factors corresponding to potential users, information needs (i.e. search topics), and systems in an interactive video retrieval context were significantly associated with perceived self-efficacy. Furthermore, results of the current study derived from the first application or examination of self-efficacy within the context of video IIR, which was warranted considering digital video, a multi-dimensional and time-based resource, can inevitably cause variations among users' needs, actions, and assessment of information, and, subsequently, approaches to the design and development of retrieval tools. A discussion of both the implications or practical suggestions based on the findings of the current study along with observed limitations follows.

Implications of the effects of prior system experience or level of use on perceived self-efficacy

The significant associations between participants' self-rated levels of current system use (i.e. prior exposure) and perceived self-efficacy were reasonable. Similar relationships have been identified in other contexts, including as part of the image information seeking, where prior experiences of users were found to be influential to preconceptions about retrieval tools and, in turn, tool selection (Conniss *et al.*, 2000). Therefore, it was significant to thoroughly examine different factors potentially contributing to users' perceptions leading up to an interactive video IIR process, which may ultimately affect subsequent actions of the users, and, furthermore, to isolate and measure effects on users' perceived self-efficacy, considering its potential influence on technology use.

Findings of the current study indicate practical implications and insights for interactive tools, like video digital libraries, including those that may help promote or encourage initial and continued use by users. Considering the current study provides only a first look at users and their levels of confidence prior to a video IIR process, the reader should keep in mind that practical recommendations may not always be exact to all situations, yet considered more approximate and comprising of the initial thoughts on potential (e.g. design) implications stemming from the findings. One such implication may include that digital video collections, particularly those deemed more specialized in nature, may benefit from being integrated into larger and more universally known platforms. If the goal of a digital video collection or library is to maintain high level of use and traffic through its IIR system, projects should consider that, based on the results of the current study, users may perhaps become less inclined to employ tools they have never or rarely used or pertain to contexts they are less familiar with. Such factors like system exposure and unfamiliarity with context (e.g. domain) may contribute to lower levels of confidence that the tool will help facilitate information needs and tasks resulting in lower levels of perceived self-efficacy and in turn use. Such results were partially shown by the stark difference in participants' prior levels of use (or exposure to) of YouTube vs C-SPAN. To stimulate use of digital video

collection, users first need confidence that they will be able to easily use the IIR tool – and its user interface – to retrieve needed information, which, in this case, may benefit from incorporating collections into a platform with more general or universal contexts where users have more experience with or recognition of its features and capabilities. This outcome may give users more confidence in completing their information tasks and move them toward initial use.

Analysis of the open-ended responses on the survey provided additional support for the inclusion and examination of system exposure as a variable in the current study and thus it's potential for application throughout future research and development in video IIR. Further, while each category had its own ranking or level of weighted frequency, based on the number of responses from participants, the categories of experience with, perceptions of (as would be garnered through experience with the system), and recognition of comfortable interface features all emerged from users' responses sufficient enough to be considered "themes" among the perceptions of participants. Moreover, experience with the provided system (context) was the third highest weighted frequency level overall, demonstrating its importance in the influence of self-efficacy, having achieved such a level in an open-ended format.

Implications of the effects of information needs on perceived self-efficacy

The relationships between perceived self-efficacy and factors pertaining to video information needs also provide applications for IIR research and development. More specifically, two topical factors were shown to be associated with participants' levels of perceived self-efficacy: knowledge or familiarity of the general topic that pertains to video searches, i.e. video information needs, and type or structure of the video information needs.

Prior research has learned that knowledge or familiarity with search topics can have various influences within actual video search sessions, more specifically, being significantly related to users' interactions, performances, and levels of satisfaction (Albertson, 2013). Therefore, associations between topic familiarity and users' levels of perceived self-efficacy, even though a phenomenon preceding actual video search sessions, were also reasonable. These findings suggest practical implications and/or recommendations for video IIR tools, including features or designs that may help promote or encourage initial and continued by users. For example, one such suggestion could include how digital video collections can provide opportunity for topical learning, beyond the boundaries of the collection, to encourage increased familiarity and understanding of the needs by users, and thus improved confidence, which may then translate into confidence and continued use. Further, as previously mentioned, benefits of having highly specialized collections integrated into larger platforms in which users have prior exposure to and preconceptions about may also provide opportunity for exploratory search interfaces for learning within the boundaries of a collection comprising large quantities of video and other types of supportive or educational information. In addition, large curated video collections that provide added or enhanced value to video items may provide a structured and well-rounded topical presentation of content to potential users. While the potential benefit of such implications have not been directly tested in the current study, they provide interesting thoughts on the matter, and, at this time, provide the general impressions or observations that adding curated value to large collections may facilitate improved understanding on behalf of the user about the collection, context, and in turn the information needed to complete information tasks. Familiarity with the topic at the focus of video searches

demonstrated a positive correlation with perceived self-efficacy, and learning has been found to occur throughout video searches (Marchionini, 2006).

The nature (or type) of the individual requests for video, e.g. known-item vs collocation video search topics, also assessed in terms of its influence on self-efficacy, was, again, a first-of-its-kind analysis within an IIR context. Self-efficacy, while examined across various technologies, has not been measured specifically according to the type of individual information needs. Results depicting associations between topic type and perceived self-efficacy, even though of lower significance than other analyses, were also reasonable considering there was a significant positive correlation between topic familiarity and perceived self-efficacy, as previously described. Furthermore, in a specific domain, even in the case of public and governmental affairs, users felt somewhat less confident in finding exact, i.e. known item, video content vs sets, as part of a collocation task, as they may not feel they are sufficiently familiar with the context to succeed in completing more-specific information needs. These findings provide considerations for video RF such as indexing at a level of specificity comparable to that of anticipated information needs of the users, enough to accommodate sufficient levels of precision from searches necessitating known-item video.

The open-ended responses from the survey, again, support the idea of factors or aspects involving video needs (and/or topics) being associated with self-efficacy in a video IIR process, with domain and topic-related factors clearly emerging as the most meaningful, frequency-wise, for why participants rated their level of self-efficacy as they did. This category would comprise considerations such as users' familiarity with the sample topic and the level of understanding (or awareness) of what video was available to be returned on the topic. While these results were reasonable and validate the inclusion of topic-related factors as potential influences to self-efficacy, the fact that this category emerged as the most significant or common, even more so than system experience, was quite telling and thus informative to future research and development of video IIR tools.

Limitations

One objective of the current study was to measure baseline levels of potential users' confidence, i.e. perceived self-efficacy, prior to a video IIR situation comprising certain information needs. Baselines were measured; yet, as they are currently reported, one limitation is that initial measures are confined to the current study, with no further comparisons of perceived self-efficacy throughout other context (e.g. textual fact finding using Google). Considering the novelty of the current study, other prior studies of self-efficacy in IIR lacked the ability or generalizability to provide suitable measures to sufficiently serve as the basis for comparison. Further, baselines provided here, i.e. through answering *RQ1*, should be interpreted as the first reported measure of perceived self-efficacy in a video IIR context, which can provide a baseline going forward and serve as the basis for thorough analyses of other factors influence on perceived self-efficacy.

However, analysis of the open-ended responses taken from the survey provide an additional category of variables, not directly tested, which provide some further insight into a baseline of self-efficacy within a video IIR context. Participants' perceptions of possessing the appropriate technological skills and abilities – generally speaking – for fulfilling the video information needs was the second highest category (frequency-wise), independent of need type and system. Even though this finding is reasonable – and perhaps expected – it presents some additional evidence into factors

related to a baseline of perceived self-efficacy when initiating interactive searches for video. Regardless, the findings emerging from the examinations of *RQ2-RQ4* constitute the bulk of the results of the current study, and baselines were assessed in order to establish them prior to examining other exact influences. It will be feasible moving forward to obtain further significance of the baseline levels of perceived self-efficacy in terms if they constitute high vs low measures compared to other contexts.

Also, the levels of perceived self-efficacy, as assessed across different situational factors, currently provide understanding of variations prior to a sample video search scenario. The video search scenario was a one snapshot in time, not necessarily part of a lengthier or longitudinal experimental study. For example, the averaged combined levels of perceived self-efficacy for completing the given information needs using YouTube and the C-SPAN Digital Video Library were measured at $M = 3.52$ (SD = 1.02) and $M = 2.92$ (SD = 1.11), respectively, significantly different. Increasing levels among the different factors, as examined, whether topical learning (to enhance familiarity), system exposure, or others, in order to significantly improve perceived self-efficacy of users and to generate statistically similar results would need to be examined in a secondary analysis.

Next, even with such practical insights emerging from the results of the current study, challenges remain for video collections and projects that are specialized in nature, as they will likely always have smaller audiences and user bases, thus fewer people with prior topical familiarity and IIR system exposure. Naturally, potential users of such systems and specialized collections may have lower levels of perceived self-efficacy before interactive information search sessions. Results of the current study suggest that not all challenges in such smaller collections are about existing project resources (e.g. marketing, outreach, development), but also pertain to the fact that they are specialized. Such was even the case of a large governmental video collection and system, developed to disseminate content of an entire television network (i.e. C-SPAN). Despite its size and interest to many, it is still somewhat specialized and thus not as widely recognized or used as much as a large socially driven video systems with general content. Lower levels of perceived self-efficacy were observed in the case of the C-SPAN Digital Video Library, and, therefore, exact application of the results of the current study face challenges and limits potentially beyond the direct control of digital projects and collections.

Conclusions and future work

Self-efficacy is a critical factor, one highly influential to ultimate decisions and courses of action taken by people. Personal beliefs, as described above, can be even more powerful than actual truth. Therefore, self-efficacy is a primary factor in and of its own right, and, as a result, a demonstrable underlying influence to many other outcomes and phenomena as well. This provides a basis and justification for why research of self-efficacy is warranted separately across different contexts, which has been observed across multiple areas including those involving technology.

Results of the current study can suggest future examination and discussion about technology acceptance within video IIR specifically. Users' inclination to select and ultimately use technology can be based on many factors and perceptions, including and beyond perceived self-efficacy. Further, there can be system characteristics or features specific to video IIR systems, like digital libraries, as defined by users, which influence users' intensions to use. Such factors can be conceptualized and further operationalized to test relationships between them and users' intention to accept and use video IIR tools

and systems. For example, as measured in Albertson and Ju (2015), RF, user interface characteristics, user support, and collection qualities emerged as the user-driven criteria for video digital libraries. Such findings are significant to perceived self-efficacy, as the needs and/or criteria of users can be associated with initial attitudes and thus levels of confidence. These can be rigorously examined in conjunction with users' intentions and inclinations to use video IIR systems. Such an examination can be additionally expanded to incorporate factors that resulted from studies of technology acceptance itself. TAM includes perceived ease of use and perceived usefulness, among others (TAM; Davis, 1989), which are validated factors widely applied as determinants in various studies of users' adoption and intention to use various systems (Kim *et al.*, 2014; Booker *et al.*, 2012; Lin, 2009; Wu *et al.*, 2007; Kim, 2006; Wixom and Todd, 2005) including digital libraries (Nov and Ye, 2008, 2009; Hong *et al.*, 2002). Again, further studies expanding beyond user confidence or self-efficacy alone can make progress toward a generalized framework based directly on user-centered factors and criteria.

There are also other potentials for future analyses to more closely examine current findings of perceived self-efficacy in a video IIR context to draw finer-level comparisons and distinctions between even more-specific groupings of factors. Follow-up or secondary analyses will provide a more-rounded and user-driven understanding of users' cognitive situations both prior to and during interactive video retrieval. Qualitative inquiry can be further reported including elaborating on how video, as an information resource or format, and factors pertaining to IIR systems and video information needs influence users cognitively. As mentioned before, there are potential implications for situational learning to improve user confidence, and perhaps use of tools, throughout an IIR process, which can possibly be enhanced through system and collection features such as expletory interfaces and curated collections. These examples provide an interesting case and motivation for examining self-efficacy further in the context of video IIR to look at how system components can be designed and tested to counter-balance lower confidence among less experience and familiar users, leading to more universal designs for video IIR systems like digital libraries. Further, perceived self-efficacy is a considerable influence of final task outcome and performance as well, so improved confidence leads to not only use, but better use of tools and performance in turn.

References

Albertson, D. (2013), "An interaction and interface design framework for video digital libraries", *Journal of Documentation*, Vol. 69 No. 5, pp. 667-692.

Albertson, D. and Johnston, M.P. (2016), "Science teachers and interactive video retrieval", *The Electronic Library*, Vol. 34 No. 1, pp. 42-57.

Albertson, D. and Ju, B. (2015), "Design criteria for video digital libraries: categories of important features emerging from users' responses", *Online Information Review*, Vol. 39 No. 2, pp. 214-222.

Bandura, A. (1977), "Self-efficacy: toward a unifying theory of behavioral change", *Psychological Review*, Vol. 84 No. 2, pp. 191-215.

Bandura, A. (1986), *Social Foundations of Thought and Action: A Social Cognitive Theory*, Prentice Hall, Englewood Cliffs, NJ.

Bandura, A. (1994), "Self-efficacy", in Ramachaudran, V.S. (Ed.), *Encyclopedia of Human Behavior*, Vol. 4, Academic Press, New York, NY, pp. 71-81.

Bekker, T.M. and Eggen, B.H. (2008), "Designing for children's physical play", *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI) Florence, ACM, New York, NY, April 5-10*, pp. 2871-2876.

Billings, J.R. and Macvarish, J. (2010), "Self-efficacy: addressing behavioural attitudes towards risky behaviour – an international literature review", January, available at: https://kar.kent.ac.uk/26082/1/Self_Efficacy_Final_Report.pdf (accessed June 15, 2015).

Booker, L., Deltor, B. and Serenko, A. (2012), "Factors affecting the adoption of online library resources by business students", *Journal of the American Society for Information Science and Technology*, Vol. 63 No. 12, pp. 2503-2520.

Compeau, D.R. and Higgins, C.A. (1995), "Computer self-efficacy: development of a measure and initial test", *MIS Quarterly*, Vol. 19 No. 2, pp. 189-211.

Conniss, L.R., Ashford, A.J. and Graham, M.E. (2000), *Information Seeking Behaviour in Image Retrieval: Visor I Final Report*, University of Northumbria at Newcastle, Trading Services, Newcastle.

Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.

Delcourt, M. and Kinzie, M. (1993), "Computer technologies in teacher education: the measurement of attitudes and self-efficacy", *Journal of Research and Development in Education*, Vol. 27 No. 1, pp. 35-41.

Desurvire, H. and Wiberg, C. (2008), "Master of the game: assessing approachability in future game design", *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI) in Florence, ACM, New York, NY, April 5-10*, pp. 3177-3182.

Ford, N., Miller, D. and Moss, N. (2001), "The role of individual differences in internet searching: an empirical study", *Journal of the American Society for Information Science and Technology*, Vol. 52 No. 12, pp. 1049-1066.

Hill, T., Smith, N.D. and Mann, M.F. (1987), "Role of efficacy expectations in predicting the decision to use advanced technologies: the case of computers", *Journal of Applied Psychology*, Vol. 72 No. 2, pp. 307-313.

Hong, W., Thong, J., Wong, W. and Tam, K. (2002), "Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics", *Journal of Management Information Systems*, Vol. 18 No. 3, pp. 97-124.

Karsten, R. and Roth, R.M. (1998), "The relationship of computer experience and computer self-efficacy to performance in introductory computer literacy courses", *Journal of Research on Computing in Education*, Vol. 31 No. 1, pp. 14-24.

Kim, D., Chun, H. and Lee, H. (2014), "Determining the factors that influence college students' adoption of smartphones", *Journal of the Association for Information Science and Technology*, Vol. 65 No. 3, pp. 578-588.

Kim, J. (2006), "Toward an understanding of web-based subscription database acceptance", *Journal of the American Society for Information Science and Technology*, Vol. 57 No. 13, pp. 1715-1728.

Kurbanoglu, S.S. (2003), "Self-efficacy: a concept closely linked to information literacy and lifelong learning", *Journal of Documentation*, Vol. 59 No. 6, pp. 635-646.

Lampe, C., Wash, R., Velasquez, A. and Ozkaya, E. (2010), "Motivations to participate in online communities", *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI) in Atlanta, GA, ACM, New York, NY, April 10-15*, pp. 1927-1936.

Lin, H. (2009), "Examining of cognitive absorption influencing the intention to use a virtual community", *Behavior and Information Technology*, Vol. 28 No. 5, pp. 421-431.

Mansourian, Y. and Ford, N. (2007), "Web searchers' attributions of success and failure: an empirical study", *Journal of Documentation*, Vol. 63 No. 5, pp. 659-679.

Marchionini, G. (2006), "Exploratory search: from finding to understanding", *Communications of the ACM*, Vol. 49 No. 4, pp. 41-46.

Marchionini, G., Wildemuth, B.M. and Geisler, G. (2006), "The open video digital library: a Möbius strip of research and practice", *Journal of the American Society for Information Science and Technology*, Vol. 57 No. 12, pp. 1629-1643.

Nahl, D. (1996), "Affective monitoring of internet learners: perceived self-efficacy and success", in Hardin, S. (Ed.), *Proceedings of the 59th Annual Meeting of the American Society for Information Science*, *Information Today*, *Medford, NJ*, pp. 100-109.

Nov, O. and Ye, C. (2008), "User's personality and perceived ease of use of digital libraries: the case for resistance to change", *Journal of the American Society for Information Science and Technology*, Vol. 59 No. 5, pp. 845-851.

Nov, O. and Ye, C. (2009), "Resistance to change and the adoption of digital libraries: an integrated model", *Journal of the American Society for Information Science and Technology*, Vol. 60 No. 8, pp. 1702-1708.

Pajares, F. (2001), "Current directions in self-efficacy research", in Maehr, M. and Pintrich, P.R. (Eds), *Advances in Motivation and Achievement*, Vol. 10, JAI Press, Greenwich, CT, pp. 1-49.

Ren, W.H. (1999), "Self-efficacy and the search for government information: a study of small-business executives", *Reference and User Services Quarterly*, Vol. 38 No. 3, pp. 283-291.

Thong, J., Hong, W. and Tam, K. (2002), "Understanding user acceptance of digital libraries: what are the roles of interface characteristics, organizational context, and individual differences?", *International Journal of Human-Computer Studies*, Vol. 57 No. 3, pp. 215-242.

Wildemuth, B.M., Marchionini, G., Yang, M., Geisler, G., Wilkens, T., Hughes, A. and Gruss, R. (2003), "How fast is too fast?: evaluating fast forward surrogates for digital video", *Proceedings of the 3rd ACM/IEEE-CS Joint Conference on Digital Libraries in Houston, TX, ACM, New York, NY, May 27-31*, pp. 221-230.

Wildemuth, B.M., Oh, J.S. and Marchionini, G. (2010), "Tactics used when searching for digital videos", *Proceedings of the Third Information Interaction in Context Conference (IIiX) in New Brunswick, NJ*, *ACM, New York, NY, August 18-20*, pp. 255-263.

Wixom, B. and Todd, P. (2005), "A theoretical integration of user satisfaction and technology acceptance", *Information Systems Research*, Vol. 16 No. 1, pp. 85-102.

Wu, J., Chen, Y. and Lin, L. (2007), "Empirical evaluation of the revised end user computing acceptance model", *Computers in Human Behavior*, Vol. 23 No. 1, pp. 162-174.

Corresponding author
Dan Albertson can be contacted at: dea@ua.edu