Scholarly uses of TV content: bibliometric and content analysis of the information use environment

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Received 14 April 2014
Revised 7 August 2014
Accepted 13 September 2014

Abstract

Purpose – The purpose of this paper is to investigate the use of television (TV) content for scholarly purposes. It focuses on: profile of scholars using TV content; the structure of their need for TV content; the situations in which scholars need TV content; and their patterns of use of TV content in each research stage.

Design/methodology/approach – Taylor's four components of the information use environment has contributed to the development of a conceptual framework. The data from the use of TV content by 668 scholars were profiled using correspondence analysis and co-word analysis. Additionally, the data from 15 interviews and content from 240 journal articles were analysed.

Findings – The authors determined that the environment of the scholarly use of TV content is unique in terms of the scholars' academic domains, research topics, motivation, and patterns of use. Six academic domains were identified as having used TV content to a meaningful degree, and their knowledge structure was presented as a map depicting the scholars' needs for TV content. Scholars are likely to use TV content when they deal with timely social and cultural topics, or human behaviour. The scholars also showed different patterns of use of TV content at each stage of research.

Originality/value – In this study, TV content was newly examined from the perspective of an information source for scholarly purposes, and it was found to be a meaningful source in several domains. This result extends the knowledge of information sources in scholarly communication and information services.

Keywords Information services, Information science, Documentation, Information studies

Paper type Research paper

Introduction

Many information use studies have examined the use of scholarly information sources, focusing mainly on the relationship between a subject domain and the use of its general information (Case, 2012). However, today, more diverse information sources are being used for scholarly purposes. Various subject domains have started to use non-traditional information sources (Palmer *et al.*, 2009). Recently, multimedia channels have emerged as a new publishing venue. For example, the *Journal of Visualized Experiments*, *SciVee*, and *SERI Video Report* publish their research findings via video as well as in text.

Although the use of television (TV) content is unfamiliar to many scholars, evidence supports its actual use by some academic groups. For example, the Vanderbilt Television News Archive has provided a TV news index for academic users, and some academic media centres (e.g. the Paley Center for Media and the University of California at Los Angeles Film and Television Archive) offer special research facilities. Some

This work was supported by The National Research Scholarship (Humanities-Sciences Area) funded by the Korea Student Aid Foundation (B00252). This study was based on a doctoral dissertation from the Department of Library and Information Science, Yonsei University, Seoul, Korea.

Journal of Documentation
Vol. 71 No. 4, 2015
pp. 667-690

0022-0418
DOI 10.1108/JD-04-2014-0062

commercial information services also offer the searching and referencing of TV content. The LexisNexis Academic legal database provides broadcast transcripts, and Endnote software offers a "film or broadcast" menu for bibliographic referencing of TV content. In practice, the ISO 690 standard for bibliographic referencing includes reference rules for TV content.

Despite this emerging trend of the use of TV content by scholars, previous studies have remained focused on the organisation of TV content rather than its use (e.g. Dowman *et al.*, 2005; Green and Klasen, 1993; Kokaram *et al.*, 2006). While some archival studies deal with the use of TV content (e.g. BBC, n.d.; Kim and Lee, 2002; Rubin, 2009), their contribution is limited to addressing the necessity of using TV content.

Considering these gaps, this study explores the information use environment (IUE) of the use of TV content by scholars. To identify the context of scholarly information use, we have used the four components of Taylor's IUE model (Taylor, 1991) as our conceptual framework. The research questions have been formulated upon these components:

RQ1. What are the demographic characteristics of scholars who have used TV content for their scholarly purposes?

RQ2. What is the structure of their need for TV content?

RQ3. In what situations do scholars use TV content for scholarly purposes?

RQ4. How do the scholars use TV content for their scholarly purposes?

Literature review and conceptual framework

Scholars' information use

Studies on scholarly information seeking and use are not new. The explosion of scholarly output after Second World War has spurred scientists' interest in finding more effective ways to use information sources. The scholarly group has been one of the top three of the most frequently studied groups in user studies over the last few decades (Julien *et al.*, 2011; McKechnie *et al.*, 2002).

We noted two main factors that influence scholars' information use: the research process and the subject domain. Many scholarly information-seeking studies (e.g. Bouazza, 1989; Ellis, 1989; Ellis *et al.*, 1993; Meho and Tibbo, 2003; White, 1975) have considered that the research process is important for distinguishing the context of the patterns of scholars' information use. White (1975) shows that their information use differs across three research processes (the problem stage, the methodology stage, and the presentation stage) and that study determined the way that information use functions at each stage. Subject domain has also been considered to be an important factor. As a result of a review of the selected articles of Case's 67 on scholarly information seeking, categorised, respectively as scientists, social scientists, and humanists and interdisciplinary (Case, 2012, p. 288), scholars' use of information is influenced by the characteristics of their subject domains. Specifically, many studies on the use of information have focused on the scholars of a single discipline (e.g. historians, artists, literary scholars, music scholars, art historians, visual artists, economists, geoscientists, chemists, or meteorologists). The different subject domains also have their own preferred information sources. For example, historians prefer newspapers and government publications (e.g. Dalton and Charnigo, 2004; Stieg, 1981).

Geoscientists, however, predominantly prefer numeric databases and informal sources (e.g. correspondence, special meetings, short courses) (e.g. Bichteler and Ward, 1989). Hjørland (1997) also observed preferred information sources that are especially useful for a specific domain, for example, patents for engineering, maps for geography, and codes and bodies of law for the law domain.

TV content as scholarly information

The concept of TV content as information has been discussed in the context of purposive and selective information seeking in media use (Bordewijk and van Kaam, 1986; Lembo, 2000; McQuail, 1997). Bordewijk and van Kaam (1986) introduced consultation-type communication, which explains that some people need media content to obtain information for help or advice. For example, someone could consult health-related TV programmes to learn about thyroid gland disease and its symptoms. Lembo (2000) observed that some people consciously, purposively, and selectively use TV content. For example, some people might keep up with current issues or economic news through the TV, in order to meet their potential information needs for their business activities.

While TV content is often used as information in everyday life, the use of TV content as a scholarly information source has only been detected sporadically in specific disciplines. In media studies, TV content is considered as the main subject of scholarly analysis and is used often as a data source (Altheide and Schneider, 2012; Jensen and Jankowski, 1991; Kompatsiaris *et al.*, 2012). These studies have tried to understand the patterns of TV messages through content analysis and to measure the extent of people's exposure to TV content (e.g. Barcus, 1983; Jordan *et al.*, 2009; Head, 1954). In psychology, behavioural scientists have also used TV content, especially in relation to testing activities (e.g. Carpenter, 1955). In political science, scholars use TV content in association with past and present political events, such as elections, coups, and demonstrations (e.g. Woolley, 2000). In the field of law, TV news content is used to trace criminal reports (e.g. Pogorzelski and Brewer, 2007). Compton (2007) and Kim and Lee (2002) revealed that humanities scholars access cultural information through TV content. For example, sociologists can obtain research evidence about family culture as it is portrayed in TV dramas or about Asian pop culture as it is portrayed in a music show.

Thus, to examine how TV content can function as a source of scholarly information, we reviewed several studies on the concept of information (e.g. Buckland, 1991; Capurro and Hjørland, 2003; McCreadie and Rice, 1999; Ruben, 1992). Of these, we focused more on the aspects of acquired information, considering that scholarly information is expected to be imported into research material. Buckland's (1991) concept of information-as-thing provided a good framework for explaining how the unformatted video streaming of TV content can be a source of scholarly information. This concept posits that information can be a real and visible thing, and this is different from the concept of information that originates from a cognitive state of uncertainty (e.g. the anomalous state of knowledge). For example, a stone in a museum can be information-as-thing while a stone in a river is just an object (Buckland, 1997). Drawing on Buckland's (1991, pp. 353-356) definition, the concept of information-as-thing consists of data, document, object, and event. "Data" denotes the results of being processed (e.g. numbers, images, or characters) for use. "Document" denotes text-bearing objects including images or even sounds to convey some sort of communication. "Object" denotes the thing

collected, stored, retrieved, or examined, based on the potential value of the information. "Event" denotes informative phenomena, such as objects associated with events (e.g. bloodstains on the carpet or footprints in the sand) or representations of events (e.g. photos, newspaper reports, or memoirs regarding sports events).

In addition, the general types of TV content were considered, drawing on Smythe (1954) and Dominick and Pearce (1976) to check if the common features of TV content correspond to scholarly information sources. This review process ascertained that TV content meets the concept of information. For example, all TV programmes can be considered to be documents, in that they convey text, image, or sound as a means of communication. If a scholar were to browse a specific TV drama to extract some features of family culture, the TV programme can be considered to be a document. Similarly, all TV programmes can be considered to be objects, considering that they can be collected, stored, or retrieved as information. For example, if a scholar were to collect several TV talk shows to analyse the discourse, these TV programmes serve as an object. Also, TV programmes can also be employed as data, in that they can be processed for their sample data. In practice, many studies of media content have used TV news coverage of a specific topic or issue (e.g. a presidential election, a terrorist event, or a SARS outbreak). Scholars can even access informative phenomena from some TV programmes. For example, specific scenes, such as the 9/11 terrorist attacks, can be considered to be events.

Taylor's IUE for scholarly purposes

This study uses Taylor's IUE as a framework to investigate the context of information use. The IUE determines users' information needs, their methods of seeking the information, and their actual use of it. This environment originally assumes organisations. Yet, many studies have extended this concept to specific homogeneous groups beyond organisational boundaries, for example, Agada (1999) for African American gatekeepers' community; Rieh (2004) for internet use at home; and Hersberger *et al.* (2006) for maltreated children's information. Consistent with these studies, this study also focuses on a homogeneous group, the group scholars, who use TV content.

The IUE model (Taylor, 1991) posits that the IUE consists of four main components: sets of people; setting; problems; and the resolution of problems. The first component, "sets of people", denotes demographic characteristics that influence information use. In the scholarly environment, this refers to a "scholar profile" consisting of the scholars' demographic factors. The second, "setting", refers to the structure, style, direction, and history of various sets of people. Because their academic communities, which have specific intellectual topics and structures, influence most scholars, we have conceptualised this component as "knowledge structure". This structure affects the way scholars think and behave about their need of information and its uses. In other words, common research interests on specific domains can result in the formation of formal and informal communities of scholars. For example, if a sociologist and an information scientist are interested in diffusion theory, they are most likely to interact with the related journals or articles, at conferences, or through other communication channels. Thus, they can be connected through their common research interests. The third component, "problems", concerns their information needs and is influenced by specific set of people's own environment and activities. Because scholars also seek specific information in their research processes (Garvey and Griffith, 1972),

we conceptualised this component as "situations for information needs". The last, "resolution of problems", refers to the process of solving information problems. As this process corresponds to the use of information sources, we refer to it as "use pattern". Table I provides this study's conceptual framework of scholarly information use. This framework is the fundamental basis for formulating the research questions and analysing the empirical data.

Methodology

Research strategy

This study considers the importance of capturing empirical evidence of the scholarly uses of TV content, so the quantitative analyses have been given priority over the qualitative ones. In other words, the quantitative section states a meaningful response to the research questions and the qualitative part reinforces the quantitative evidence. This sequential approach is useful for seeking a more meaningful interpretation of quantitative results through follow-up analyses of the qualitative data (Creswell, 2009). The research stages consist of two phases: a bibliometric study, followed by an interview study. A bibliometric study is commonly used to specify the "external context" of scholarly communication and to visualise the knowledge structure (Borgman, 1990; Borgman and Furner, 2002; Vargas-Quesada and de Moya-Anegón, 2007). To discover and describe the empirical patterns of the use of TV content in scholarly communication, we employed three bibliometric methods: correspondence analysis; co-word analysis; and quantitative content analysis. Subsequently, qualitative content analysis was conducted to support and specify the quantitative findings through the in-depth interviews. The former methods were mainly used for answering *RQ1* and *RQ2*, whereas the latter method focused on answering *RQ3* and *RQ4*.

Sample selection

The target population of this study is "the scholars who have ever used TV content for their research". In order to meet this specific criterion, criterion sampling was carried out. Since it is difficult to identify the population in real-world settings, we deduced the scholarly use of TV content from journal articles, one of the most common types of scholarly document. Based on the fact that the "Vanderbilt Television News Archive/Index (VTNA)" has served as a source for scholarly uses of TV content (Culbert, 1974; Edy *et al.*, 2005; Kiernan, 1999), we employed the specific term, VTNA, as the cue-phrase for the search in Google Scholar. Google Scholar's snippets allowed us to judge whether or not the author(s) of each article actually used VTNA in its content.

Components of IUE (Taylor, 1991)	Framework of scholarly information use of the present study	The environment of the scholarly use of TV content
Sets of people	Scholar profile	(*RQ1*) Profile of scholars using TV content
Setting	Knowledge structure	(*RQ2*) Structure of scholars' need for TV content
Problems	Situations for information needs	(*RQ3*) Situations in which scholars need TV content
Resolution of problems	Use patterns	(*RQ4*) Scholars' patterns of use of TV content in each research stage

Table I. The environment of the scholarly use of TV content, based on the IUE components

We then traced the subject domains based on the journal title of each article that revealed that TV content had been used. From the 617 documents, we obtained the 292 relevant journal articles and sorted out the 200 articles in the journals were covered in *SCI*, *SSCI*, or *A&HCI*. Topic analysis was conducted, based on the Web of Science categories for the journal titles corresponding to the 200 articles. As a result, we identified the 14 domains (i.e. communication, political science, interdisciplinary science, sociology, medical science, law, economics, history, environmental science, psychology, area studies, education, folklore, and gerontology). The top six subject domains cover 92 per cent (184 out of 200 cases) and comprise the sampling frame, as follows: communication; political science; interdisciplinary science; sociology; medical science; and law. Within these six dominant domains, we selected the 240 instances of journal article data, 668 instances of author data, and we then obtained interview data from interviews with 15 scholars.

Data collection

For the data collection, a sample of 240 journal articles was collected from the Web of Science. A query was formulated based on the three fields: the topic; the Web of Science categories; and the time span. The topic was defined as "television". The Web of Science categories were based on the six dominant domains that comprise the sampling frame, and the time window was ten years, from 2002 to 2011. From the searches, 1,620 journal articles were identified and their relevance was judged by a researcher, who has a background in mass media and information science. The judgement of relevance was made by the assessing the abstract and the full text of each article at least twice, for three consecutive weeks (from 21 February 2012 through 13 March 2012). The criteria were as follows: TV content must be used as information; the TV content use must be associated with the research process; and the articles must be written in English. As a result, 240 journal articles were selected from academic journal databases and archived as a full-text PDF file.

Based on the 240 journal articles, we collected two types of author data: demographic information (i.e. country, affiliated institution, academic discipline, and position) and research interest. From the articles, 809 authors were extracted, including co-authors and duplicate names. The final number of authors was 668 after removing duplicate names. Most of the authors' demographic information and some of the research interest data could be collected from the first or last pages of the journal articles, entitled "About the Authors", "Bio(s)", "Biographical Notes", or "Notes on the Contributors". We also used an information database of scholars' profiles, COS Scholar Universe. Its "expertise" field was useful for collecting each scholar's research interest. By using these two sources, 90 per cent of the author data were found. The remaining data were collected from the authors' homepages and from scholarly social networking sites (e.g. ResearchGate and LinkedIn).

Interview data were collected to obtain first hand data on the scholars' needs and use patterns of TV content. Based on the sampling criteria and the findings of the quantitative analysis and pilot interviews, 15 scholars, who have used TV content in the six dominant domains, were selected. The duration of the interviews ranged from 42 minutes to 124 minutes, with an average length of 65 minutes. In-depth interviews were conducted in the following steps: developing an interview guide; obtaining consent and scheduling; interview practice; performing and recording the interviews; and transcription.

Data analysis

This study used quantitative and qualitative methods. In the quantitative part, three methods of bibliometric data analysis were used: correspondence analysis, co-word analysis, and quantitative content analysis. In the qualitative part, qualitative content analysis was carried out. Table II presents a summary of the data analysis methods used for each research question.

The 668 instances of author data, consisting of scholars' demographic information and research interests, were analysed using two bibliometric methods: correspondence analysis and co-word analysis. Correspondence analysis is useful for mapping the dominant factors in a specific area (Benzécri, 1992). We used the correspondence analysis mainly to reveal the patterns of the profile of scholars using TV content (*RQ1*). This analysis was also used for mapping some cases associated with the situations in which scholars need TV content (*RQ3*). Specifically, we examined the association between the factors of scholarly use of TV content (e.g. demographic information, TV genre) and the subject domains. For example, in order to create a correspondence map, factor variables were extracted from author data, based on high frequency. The number of factor variables ranged from ten to 15, providing both good quality mapping results and good explanatory power. Generally, two dimensions, accounting for over 70 per cent, are considered a good quality mapping result (Clausen, 1998). After defining the factor variables, a matrix was created with each factor (i.e. country, affiliated institution, academic discipline, and position) and the subject domain variables.

Co-word analysis was conducted for the keywords of the research interests of 668 scholars, in order to reveal their knowledge structure (*RQ2*). From the collected research interest data (1,554 keywords), vocabularies were standardised by using the controlled vocabularies of the Library of Congress Subject Heading (LCSH). However, concerning the keywords extracted from the medical domain, Medical Subject Headings was also used. For example, the terms of children's health habits, children's health behaviour, and childhood health behaviour were combined into "health behaviour in children" by using LCSH. As a result, 673 standardised keywords of research interests remained. Of these, the top 127 keywords, comprising 70 per cent of the total collection, were chosen for co-word analysis.

The co-occurrence frequency matrix of 127×127 keywords was created and then transformed into a correlation matrix by using Pearson's correlation coefficient

	Quantitative data analysis			Qualitative data analysis
Research questions	Correspondence analysis	Co-word analysis	Quantitative content analysis	Qualitative content analysis
(*RQ1*) Profile of scholars using TV content	O	X	X	X
(*RQ2*) Structure of scholars' need for TV content	X	O	X	X
(*RQ3*) Situations in which scholars need TV content	#	X	#	O
(*RQ4*) Scholars' patterns of use of TV content in each research stage	X	X	#	O

Notes: O, useful; #, somewhat useful; X, not useful

Table II. Research questions and data analysis methods

(Pearson's *r*) to represent the proximity of the vectors of the 127 keywords of research interests. The mapping result was presented using Pajek software (version 3.01) (Batagelj and Andrej, 2012). The pathfinder network scaling algorithm was used to increase local detail and create explicit representations of the structures (Börner *et al.*, 2005). We identified each cluster by the subject domain corresponding to their respective keywords.

The 240 instances of journal data and the 15 instances of interview data were analysed using quantitative and qualitative content analysis (*RQ3* and *RQ4*). Quantitative content analysis was used to identify the contextual components from the document sample, and qualitative content analysis was used, mainly to confirm the relevance of the components and investigate the internal context in detail. First, an a priori pilot coding scheme was created based on the relevant literature of information needs (e.g. Dervin and Nilan, 1986; Paisley, 1968; Taylor, 1991) and use patterns (e.g. Bouma and Rod, 2004; Trochim and Donnelly, 2008; White, 1975).

Second, pilot coding was conducted with the random sample, comprising 25 per cent of documents ($n = 240$). The unit of analysis was a paragraph, considering that information needs and use patterns often appear together within a single paragraph. Multiple coding was allowed when one quotation contained more than two types of concept. To ensure reliability, the coding process was closely reviewed twice. As a result, 12 codes were found to correspond to *RQ3*, and five codes to *RQ4*. A second coder, who has a master's degree and has had experience with conducting content analysis in the study of information behaviour, verified this result. The two paired tests of coders achieved satisfactory reliability of 0.85, as calculated by Holsti's formula, which is above the generally acceptable level of 0.80 (Krippendorff, 2004).

Third, the interview data were also coded. To facilitate effective and consistent coding, ATLAS.ti 7.0 was used. The labour-intensity of open coding was almost 150 hours, for each of the three weeks (from 11 September 2012 to 2 October 2012). As a result, 463 quotations were extracted from the 15 interviews (an average of 30 quotations per interview) and 325 codes resulted from the open coding.

Subsequently, axial coding produced a higher level of concepts and categories, compared to the results of the open coding. The associated codes were grouped together by meaning and context. Thus, 47 codes remained (27 codes for *RQ3* and 20 codes for *RQ4*). The second coder, a doctoral student with background knowledge in TV metadata and research methods, re-examined this coding decision. An inter-rater reliability test was conducted on 15 per cent of the quotations. By using Holsti's formula, the inter-rater reliability was found to be 0.88. Through this agreement procedure, a minor revision was made to the initial coding scheme. Three ambiguous codes were deleted, and three similar codes were combined into one. The revised coding scheme consisted of 21 codes for *RQ3*, and 20 codes for *RQ4*.

Lastly, by using the newly revised coding scheme, we re-did the final coding with the entire interview sample ($n = 15$) and the document sample ($n = 240$). The coding procedure was the same as previously described for the pilot document coding and interview coding. The coding took almost 133 hours, spread over three consecutive weeks from 11 November 2012 to 2 December 2012. The final coding scheme comprised 23 codes for *RQ3* and 20 codes for *RQ4*. These codes were interpreted as contextual components, as shown in Table IV. The final coding result was exported into a Microsoft Excel file as a code-document cross-tabulation, containing the frequency of codes across documents, by using the analysis function of ATLAS.ti. The processed data were used mainly for correspondence analysis and quantitative content analysis.

Validation

To ensure validity, two major techniques in qualitative research were employed: peer debriefing and audit trail. Peer debriefing is a review process conducted by an expert, and it helps probe the researcher's bias, explore meaning, and clarify the basis for interpretation (Creswell and Miller, 2000; Guba and Lincoln, 1985). Audit trail is used to examine the data and the process stemming from the inquiry and to determine the inferential consistency of the findings (Guba and Lincoln, 1985). In the present study, the findings were discussed with the two scholars who are familiar with the substantive area of the research and methodological issues. They provided positive feedback on the research findings. Additionally, the findings derived from the different types of data (e.g. journal articles, interviews) were continuously compared, verified, and integrated into a unified result from the data collection to analysis.

Results

Profile of scholars using TV content

RQ1. What are the demographic characteristics of scholars who have used TV content for their scholarly purposes?

The scholars who use TV content to gather information were from the following fields of study: communication (28.8 per cent); political science (20.3 per cent); sociology (17.7 per cent); interdisciplinary science (11.6 per cent); medical science (11.1 per cent); and law (10.5 per cent). These six domains include 58 different disciplines and the top 18 disciplines comprise over 80 per cent of the total cases. We further analysed how the disciplines can be grouped together by analysing the associations between disciplines and domains. This resulted in six clusters of disciplines: first, the disciplines of communication, journalism, mass communication, media studies, and telecommunication correspond to communication; second, the disciplines of political science, political communication, politics and international relations correspond to political science; third, the disciplines of sociology, anthropology, and linguistics correspond to sociology; fourth, the discipline of linguistics also corresponds to interdisciplinary science; fifth, the disciplines of medicine, public health, healthcare science, community health, and psychology correspond to medical science; sixth, the disciplines of law and criminology correspond to law. Table III shows the correspondences between the six dominant domains and disciplines, which helped narrow down the subject areas of the scholars who use TV content.

The number of countries was greater than expected and was biased towards a relatively small number of countries. The total number of countries was 25, including 74 per cent of the 34 member states of the Organisation for Economic Co-operation and Development. Almost half (48 per cent) of the countries accounted for 98 per cent of the cases. Specifically, Australia, Spain, and Japan were strongly represented in the use of TV content for medical science. Israel and the UK were prevalent in the sociology. Additionally, associations between single country and subject domain were found for the Netherlands and political science; and Canada and law.

Similarly, some institutes are prominent in specific subject domains, although most of the scholars examined in the present study are dispersed across 362 institutes. For example, 83 per cent of the scholars affiliated with the University of Sydney (15 out of 18) use TV content in the discipline of public health. Additionally, some universities are prominently associated with the communication domain. For example, a 100 per cent match to the domain was observed for University of Arizona (12 out of 12)

Domain	Discipline	Country	Affiliated institution	Position
Communication	Communication Journalism Mass communication Media studies Telecommunication	USA	Univ. of California, Santa Barbara Univ. of Arizona Univ. of Wisconsin-Madison	na
Political science	Political science Political communication International relation	The Netherlands	Univ. of Amsterdam Emory University	Chair Director Post doc. researcher Journalist
Interdisciplinary science	Linguistics*	na	Louisiana State Univ.	na
Sociology	Sociology Anthropology Linguistics*	UK Israel	na	Lecturer
Medical science	Medicine Public health Healthcare science Community health Psychology	Australia Spain Japan	Univ. of Sydney	Researcher Research Professor Statistical analyst Manager
Law	Law Criminology	Canada	na	na

Table III.
Summary of the profile of scholars using TV content

Notes: This result is based on the correspondence analyses for the combinations of six dominant domains and 668 TV content-use scholars' demographic information (discipline, country, affiliated institution, and position). The case of Linguistics marked asterisk corresponds to two subject domains

and for the University of California, Santa Barbara (11 out of 11). At the University of Wisconsin-Madison, 52.6 per cent of the scholars use TV content associated with the communication domain (ten out of 19). Political science emerged as a strong domain in two of the universities (University of Amsterdam; and Emory University). The use of TV content by scholars was 81.8 per cent at the University of Amsterdam (18 out of 22) and 88.9 per cent at Emory University (eight out of nine). At Louisiana State University, 54.5 per cent of the scholars involved use TV content (six out of 11) for their studies in interdisciplinary sciences.

Scholars who use the TV content hold various positions, from practical to academic. For example, a number of authors in the political domain were journalists (e.g. a CNN reporter), and many authors in the medical science domain were affiliated with research institutes that focus on health policy and health promotion (e.g. the Australian Centre for Health Promotion in University of Sydney; the NSW Centre for Physical Activity and Health; and the Kissileff Laboratory for the Study of Human Ingestive Behaviour at the University of Liverpool). Profiles of the scholars who use TV content are shown in Table III. These demographic characteristics increase our understanding of the environment of TV content use by describing the geographic, social, and disciplinary settings of the scholars.

Structure of scholars' need for TV content

RQ2. What is the structure of their need for TV content?

The knowledge structure denotes the setting that influences the TV content needs in scholarly communication. The visualisation of the knowledge structure shows four

clusters: hub, political science, law, and medical science (see Figure 1). The hub domain represents the core group of TV content needs, which is associated with communication, interdisciplinary science, and sociology. This was identified as a hub because the betweenness centrality values of the involved topic keywords were relatively high with 0.3 or greater (e.g. "mass media" with 0.55, "effect of mass media on something" with 0.48, "popular culture" with 0.52, and "social psychology" with 0.35). These research interests are associated with the need to understand human behaviour, specifically focusing on the interaction between society and culture, and the individual. For example, one research interest on "the effect of mass media on something" (betweenness centrality = 0.48) is mainly associated with people's attitudes towards a specific phenomenon portrayed in current mass media content. Another keyword, "social psychology" (betweenness centrality = 0.35) is concerned with how their social environment affects people's thoughts, feelings, and behaviours.

In the political domain, the research interests converge on the scholars' needs in the study of practical politics, associated mainly with "public opinion" (betweenness centrality = 0.55), "elections" (0.21), and "international relations" (0.53). Election-related research interests include elections, political campaigns, communication in politics, and political participation. International relations-related research interests include issues that are more global, such as "world politics", "social conflict", and "terrorism".

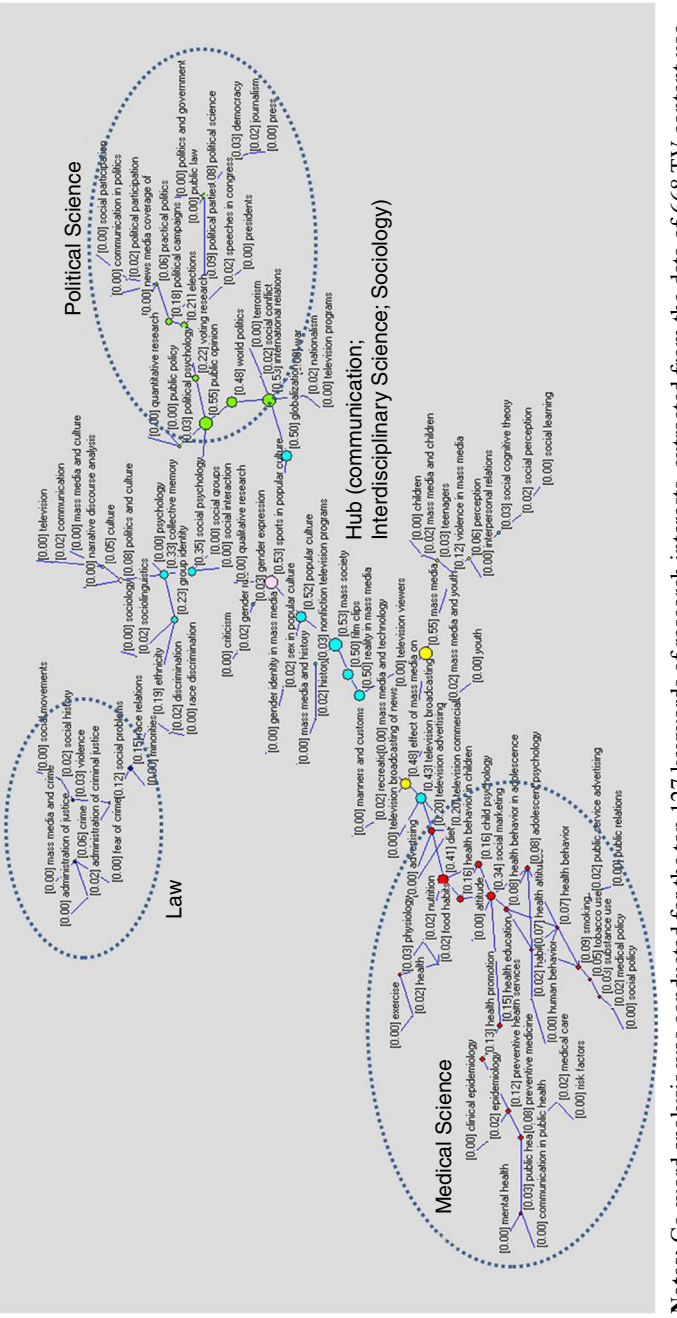
The law domain addresses the need to consider public attitudes towards social problems. Specifically, the research interest in "social problems" (0.12) was conceptually linked with "crime", "violence", and "race relations". The medical domain's research interests are very homogeneous, focusing on the TV content needs for the study of public health and health behavioural change. Particularly, the keyword "diet" (0.41) was prominent and was associated with five research interests ("nutrition", "food habits", "health behaviour in children", "television commercials", and "television advertising"). This cluster of research interests implies the association between TV advertisements and health behaviour, in relation to public health. This distinct, homogeneous medical domain could be narrowed down to a public health domain. Therefore, more the focused subject domain of public health is used hereafter.

Situations in which scholars need TV content

RQ3. In what situations do scholars use TV content for scholarly purposes?

For this research question, scholars' TV content needs were identified across all research processes. Specifically, we discovered their need for seeking a research topic, formulating research questions, using research data, providing the cue for the hypotheses, and supporting their arguments. For example, a political science interviewee said that he needed newscasts to capture the social issues regarding his research interest. A sociologist employed the narrative structure from a TV drama to examine family culture. An interdisciplinary scientist adopted excerpts of newscasts to support his arguments. Some other cases used TV excerpts in relation to political events (e.g. a presidential campaign or 9/11) and used TV content to explain how the media affects the public and society.

The most frequently observed patterns in the document content analysis ($n = 240$) was that scholars need TV content to examine social trends (55.0 per cent), understand people's consciousness and behaviours (32.9 per cent), and interpret popular culture

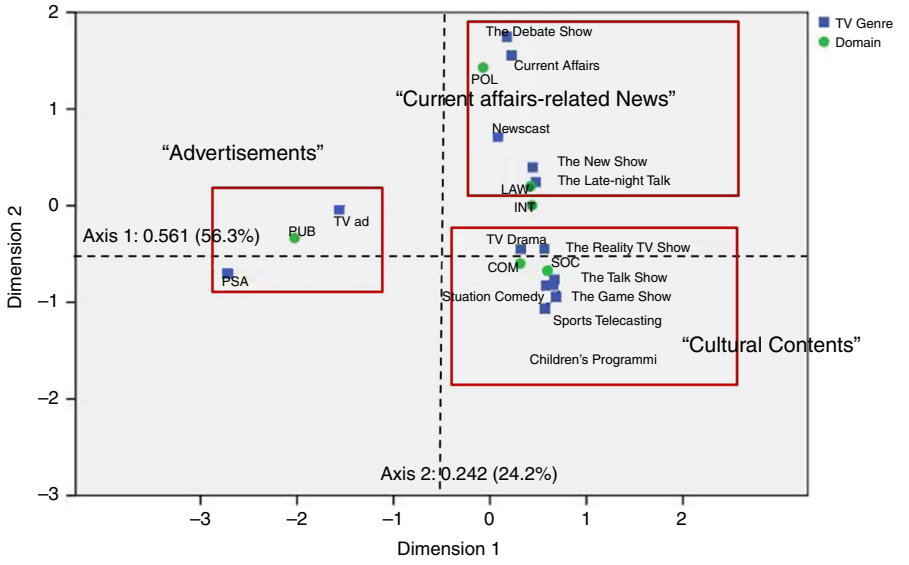


Notes: Co-word analysis was conducted for the top 127 keywords of research interests, extracted from the data of 668 TV content-use scholars. Betweenness centrality was calculated during co-word analysis of the top 127 keywords of the scholars' research interests. The number in brackets (e.g. [0.50]) preceding each keyword denotes its betweenness centrality value. The node size reflects its betweenness centrality value

Figure 1.
The need structure of TV content over all six dominant domains (betweenness centrality)

(11.3 per cent). For example, some scholars use TV news coverage of politically sensitive issues, crime, and public health issues; other scholars consider TV content as a source to observe, measure, and describe people's consciousness and behaviours; still others interpret cultural images in the TV content (e.g. anti-immigrant jokes on a late-night talk show, or gay characters in a TV drama).

Figure 2 shows the result of correspondence analysis, indicating close relationships between TV genres and domains. Three major clusters (current affairs-related news, cultural contents, and advertisements) were identified. On the left side, TV ad and public service advertising (PSA) were identified together with the public health science domain. This means that public health scientists are more likely to use advertisements. For example, according to the results of our document analysis, advertisements are mainly used as research data in public health science to estimate behavioural responses towards media exposure. On the right hand side, two different clusters can be seen. One is characterised as the TV genres of current affairs-related news (e.g. debate show, current affairs, newscast, news show, and late-night talk show). Such TV genres correspond to the domain of political science. The other cluster can be represented by cultural contents. The domains of communication and sociology use various types of TV genre as cultural content (e.g. TV drama, reality TV show, talk show, game show, situation comedy, sports telecasting, and children's programming). These type of data are used by scholars to describe a certain culture in their narratives. Interestingly, some scholars use certain features of TV content, such as TV guests, music, or bulletin board messages. For example,



Notes: In this map, the abbreviations of the six dominant domains are as follows: COM, Communication; POL, Political Science; INT, Interdisciplinary Science; SOC, Sociology; PUB, Public Health Science; and Law. Correspondence analysis was conducted for the combinations of six dominant domains and TV genres resulting from the quantitative content analysis of the document sample (n=240). The two dimensions account for 80.5 percent of the total variance in the data. The total inertia of the profiles is 0.803

Figure 2. Frequently needed TV genres corresponding to six dominant domains

TV guests were used as interviewees or survey participants. Some of the music in evening dramas was used to examine its function of attracting attention. Bulletin board messages were also used to assess public opinion of how people respond to social issues in TV content.

Formal and informal communication also influences these TV content needs. In formal communication, the scholars' TV content needs are derived from the theoretical background of effect-related theories. The scholars mainly focus on how TV constructs and portrays society. The following excerpts from two interviews illustrate these uses and purposes:

> I tried to examine how the professions in TV dramas are expressed and portrayed. I am interested in how doctors are portrayed in TV dramas over time. The background of the study was derived from cultivation theory in communication study.

> In electoral campaign studies, agenda-setting theory is mainly used; additionally priming effect and frame setting are also discussed. A very important issue is whether audiences adopt the portrayal of TV contents.

For informal communication, scholars' TV content needs are derived from informal contact with their colleagues or other professionals. The two key aspects of informal communication are first, social contact with the professionals engaged in media-related work and second, everyday talk concerning TV programmes. Indeed, several interviewees stressed that other media-related professionals, such as media scholars, announcers, and TV producers, affect their needs for TV content. For example, informal contact with media scholars through e-mail exchanges or conference influences their needs and uses of TV content. Additionally, scholars' involvement with non-governmental organisations' media monitoring projects also influences their needs for TV content. Some scholars capture a research topic or problem from everyday conversation concerning TV programmes. These needs are derived from casual rather than academic situations.

Regarding the more personal needs for TV content, the scholars' familiarity with the media determines their research needs. Interestingly, one-third of the interviewees (five out of 15) had experiences with media-related work and activities, either as a reporter, a journalist, an interviewee, a student of media studies, a TV guest, and/or an author who published a book on mass media. The interview participants said that this media-related work motivated them to use TV content. Additionally, two interview participants commented that their personal tendencies towards heavy TV viewing affect their need for TV content.

Lastly, the scholars' institutional contexts influence their needs for TV content. Government policy, social movements, and/or their scholarly social situation play a significant role in shaping their needs. For example, two interviewees noted that they have developed their needs for TV content from government policy:

> There is a nutritionist association, which is called the Korean Dietetic Association. It started to monitor nutrition under the support of the Ministry of Health. There was an effect of monitoring on TV and newspaper […] My research using TV content was conducted in line with the government policy.

> Government does things to promote health through anti-smoking campaigns and other public service advertisements. You can get some recent research on anti-smoking. We did that research to know the effect of public service announcements aired on TV because our government spent so much money on the prohibition of smoking.

Taken together, the contextual components of four categories influence scholars' needs for TV content: research on the social environment; formal and informal communication; scholars' media familiarity; and the institutional context. The first and the third categories are derived from the scholars' individual characteristics, while the second and the fourth are influenced by social factors.

Scholars' patterns of use of TV content in each research stage

RQ4. How do the scholars use TV content for their scholarly purposes?

We also investigated the ways in which scholars use TV content during each research stage: problem; methodology; and presentation (see Table IV). During the problem stage, scholars brainstorm and generate ideas to develop their research questions. The methodology stage involves data collection and processing, while the presentation stage involves analyses of the data.

During the problem stage, the patterns of TV content use for generating of research ideas and defining research problems were identified. When scholars generate research ideas from TV content, two information-seeking behaviours are involved: encountering and browsing. Encountering occurs when scholars accidentally discover some research ideas from TV content as follows:

> Especially in food safety experiments, I sometimes discover some good ideas from the TV programmes.

Research stages	Subcategories of TV content use	Contextual components: Relevant code name	*n* of frequency	%
Problem stage	Generation of ideas	Encountering[a]	na	na
		Browsing[a]	na	na
	Definition of problem	Capturing interesting works	67	27.9
		Capturing social issues	58	24.2
		Employing influential messages	50	20.8
		Monitoring media content	62	25.8
Methodology stage	Data gathering	Searching	50	20.8
		Obtaining TV content data	138	57.5
		Gathering survey data	48	20.0
	Data processing	Text coding	47	19.6
		Video coding	43	17.9
		Video editing	23	9.6
		Screen viewing	17	7.1
		Transcribing	7	2.9
		Script reading	2	0.8
Presentation stage	Analytical assistance	Content analysis	78	32.5
		Discourse analysis	22	9.2
		Conversation analysis	7	2.9
		Statistical analysis	114	47.5
		Description of the results	74	30.8

Notes: The descriptive statistics are based on the document content analysis ($n = 240$). We have allowed for multiple coding. [a]The two codes of "Encountering" and "Browsing" were obtained from the interview sample ($n = 15$)

Table IV. Summary of the use patterns of TV content

> For instance, I was watching TV drinking beer with one of my friends and there was martial arts on TV. It was really cruel to me to see this […] It was really interesting that that kind of cruel thing was on TV for the whole population to watch. I was beginning to think I will do some research regarding media violence.

Additionally, scholars who use TV content seem to generate ideas through browsing. They tend to search video images sequentially and purposefully. As shown in the following three quotations, scholars look through TV content sequentially to gain research ideas. In terms of browsing, some scholars record TV content, and others simply watch the content:

> I recorded all related TV content. After that, as my dissertation was about reality TV, I discarded what I could not use […] While browsing TV, I selected the standardised patterns and they worked really well with what I was looking for.

> I was normally browsing TV videos. After one or two times, I could see naturally the main agenda of what they want to say. After that, I analysed and criticised the video […].

> Around 1999, I made up my mind to do research on TV dramas, so I started watching TV from 2000. Over the weekend, I was browsing all TV dramas, which were on TV during the previous week […] Beginning with drama titled < All of Eve > I watched all the programmes.

When identifying research problems based on the TV content, four patterns emerged: capturing interesting works (27.9 per cent); capturing social issues (24.2 per cent); employing influential messages (20.8 per cent); and monitoring media content (25.8 per cent). The first two behaviours of capturing are associated with information-encountering behaviours.

Some scholars claim that TV content can influence people's consciousness, attitudes, and behaviour; they measure the media effects on behaviour. Scholars use TV content to investigate certain attitudes or behavioural changes in people, stimulated by the TV content (e.g. voting behaviour, health attitudes, and fear of crime). Specifically, newscasts, TV ads, and PSAs (28 cases out of 50, 56.0 per cent) were frequently considered as influential. This pattern of use was prominent in public health science, political science, and communication.

Other scholars claim that TV content is influential, but they focus more on examining whether it reports social phenomena fairly. For example, scholars are interested in how objectively newscasts cover political and social issues, how accurately health information in TV ads is conveyed to the public, and how well criminal drama reflects social reality. The preferred TV genres for monitoring media content are newscasts (26 cases out of 62, 41.9 per cent), followed by TV ads (11 cases, 17.7 per cent), and drama (ten cases, 16.1 per cent). The same as in the case of influential messages, the pattern of monitoring media content is prominent in public health science and political science.

During the methodology stage, many scholars use TV content to search for a certain type of data (e.g. discourse, video image, narrative structure, TV guest, or music) and they obtain this data from TV programmes. In many cases, searching and obtaining data from TV content are sequential processes. Searching involves accessing the metadata regarding the TV content (e.g. TV schedule, audience rating, target audience, viewership, news articles, or catalogues). As the interview response below indicates, the scholar searches first for the topic (e.g. "queer") with a bibliographic tool, such as a catalogue of TV content (e.g. "TV guide") and subsequently tries to obtain data from the TV content (e.g. "video recording"):

> In America, there is a *TV Guide* that lists TV schedule for one week. Based on *TV Guide*, I recorded all programmes related to queer-related programming.

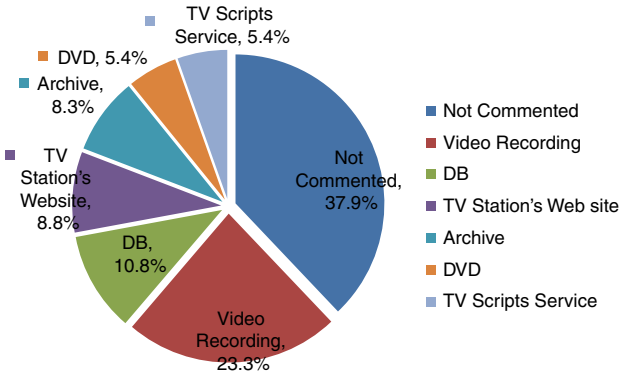
In particular, we found that when scholars search for specific TV content data, they highly rely on three types of audience-related information: audience rating; media markets; and target audiences. Audience rating is concerned with how many people view the TV content. Media market denotes a region where the population can receive the same television offerings. The scholars basically defined the sample boundary, considering high audience rating and the specific media market. The target audience is concerned with what kind of people view the TV content. The scholars also consider the target audience when they search the TV content for their research. For example, some scholars defined the sampling frame as "children's programme", in order to examine children's behaviour.

Second, when scholars search for TV content, they need to seriously consider time-related information. Scholars consider air date/time to be important, and mainly, they consult a TV schedule to obtain this information. The following quotations illustrate these characteristics:

> There was a way to collect TV commercials at that time. I consider the time as an important factor […] Since TV commercials have a different effect on time and frequency with which they are exposed to the content.

> The TV political ads generally start just before the news airs. I consulted a TV schedule from the Central Election Management Committee and asked for those advertisements from the broadcasting company archive […].

In TV content searching, we observed no distinct use patterns. Although TV content is characterised as multimedia content, with a mixture of image, audio, and video, many scholars still access it by its text, using keyword search terms (instead of image, audio or video) to browse through databases and/or archives; and yet, scholars have access to various other information sources (see Figure 3). The most frequently observed patterns were video recording (23.3 per cent), followed by databases (10.8 per cent), TV station's web sites (8.8 per cent), archives (8.3 per cent), and DVD and TV scripts services (5.4 per cent). So far, scholars who use TV content have been unfamiliar with the use of electronic databases. Yet, political scientists and jurists occasionally use some abstract databases (e.g. Vanderbilt Television News Archive) and transcript databases (e.g. LexisNexis).



Note: n=240

Figure 3.
Frequently needed information sources for TV content from the content analysis

The gathered TV content tends to be processed in six ways: text coding (19.6 per cent), video coding (17.9 per cent), video editing (9.6 per cent), screen viewing (7.1 per cent), transcribing (2.9 per cent), and script reading (0.8 per cent). Two types of data processing can be characterised as "TV content text processing" (text coding, transcribing, and script reading in Table IV) and "TV content image processing" (video coding, video editing, and screen viewing).

In text processing, scholars handle TV content by focusing on the text, especially in relation to the discourse. Text coding is conducted as part of the content analysis of the text, which typically contains discourse data (e.g. political discourse) extracted from TV content. Text coding is accompanied by transcribing or script reading. For example, scholars use typed, verbatim transcripts of discourse from tape-recorded TV programmes when there are no TV scripts available. Scholars who can access or obtain TV scripts tend to read them for their analysis.

In image processing, scholars use visual TV content, especially the video images or the response data from those viewing the images. The TV content image can be processed using video coding, video editing, and screen viewing. For video coding, scholars mainly employ video images, especially in advertisements, current affairs, and cultural contents. The collected video images are categorised into meaningful units of analysis. During a video editing experiment, the edited video becomes stimulus material. To obtain response data from viewers, scholars asked a group to watch the edited video with a specific message, in order to measure their response; they were then instructed to complete a questionnaire. Screen-viewing captures some image or narrative from TV content, or allows coders to browse TV content as a preliminary means of conducting video coding.

In the presentation stage of their work, scholars use TV content to present their research findings. They tend to use TV content to conduct specific analysis as well as to describe the results of the final analysis. In particular, statistical analysis was most frequently used (47.5 per cent). The use of inferential statistics was prominent in situations in which scholars tried to predict and describe public health behaviour or legal consciousness. The second most frequent means of analysis was content analysis (32.5 per cent). Many scholars focus on the messages carried by the TV content. The preferred TV genres for content analysis are newscasts (36 cases out of 78, 46.2 per cent) and TV ads (17 cases, 21.8 per cent). Although the discourse analysis (9.2 per cent) and conversation analysis (2.9 per cent) represent a relatively small proportion, many scholars in the present study (primarily interdisciplinary scientists and sociologists) use both methods to analyse TV content, especially to interpret cultural contents. A large number of scholars who use TV content also use it to support their research evidence (30.8 per cent). These scholars tend to employ TV content as an example or a reference to confirm an argument or to present their research findings.

Discussion

Despite a wide variety of information sources for scholars, most studies on information use have focused on traditional sources, such as journals, academic databases, and reference sources. This study focused on the context of one specific information source – the one that has remained unexplored. TV content was examined from a new perspective – TV content as an information source. Indeed, it was found to be a meaningful information source for scholarly purposes in several domains beyond communication. This result extends the findings of the studies on information sources in scholarly communication and related services.

Theoretically, Taylor's IUE framework, which focuses on the "context" in information behaviour, was adapted to explain the context, not only of scholarly information needs and uses, but also of the knowledge structure of scholars who use TV content for the purpose of research.

Practically, identifying the context within which scholars use TV content for scholarly purposes provides information for libraries and archives that is useful for building service guidelines for scholar-users as a specialised group. The findings indicate that the scholars' demographic characteristics and research interests influence their use of the TV content. The four contextual components of TV content use can be grouped to represent an environment for the use of TV content. The environmental characteristics inform many facets of the use of the TV content and are useful for the design of user-oriented systems. For example, some of the identified components, such as audience-related information or a certain type of data (e.g. discourse, video image, narrative structure, TV guest, or music) can be used in specifying search options. In addition, the scholar profile and the TV content-need structure provide service providers with decisive information to strategically plan collections in broadcast archives and related institutes. The findings can also assist current and potential scholars who need to use TV content pertaining to the social environment for their research.

Unformatted material, such as TED videos and political cartoons, have recently been discussed in scholarly communication (Sugimoto and Thelwall, 2013; Wu, 2013). However, despite the need of some subject domains for TV content, it has remained difficult for scholars to access and obtain TV content for their scholarly purposes. Considering that TV content is a unique source, particularly useful for examining social trends, understanding people's consciousness and behaviours, and interpreting popular culture, scholars who use the TV content are a specialised user group. Understanding their use environment may initiate further work on their particular needs and the organisation of this atypical information.

Conclusion

This study has examined why, how, and in what contexts scholars use TV content. Based on the Taylor's IUE components, the result provides the following summaries and implications:

(1) The academic backgrounds of scholars who use TV content are communication, political science, sociology, interdisciplinary science, medical science, and law. In addition to identifying these six domains, we articulated the demographics of the scholars using them. The scholars studied are from 25 countries, and of these, 12 countries accounted for 98 per cent of all cases. Additionally, 362 institutions were identified, and of these, some institutes were more biased towards particular domains. For example, the University of Amsterdam and University of Sydney were strongly represented in the political science and medical domains, respectively. The scholars involved in the study hold various positions, from practical to academic. The above findings contribute to a definition of the boundaries of the potential academic user group of the TV content.

(2) The need structure for TV content comprised four domains: first, a hub consisting of communication, interdisciplinary science, and sociology; second, political science; third, law; and fourth, medical science. Each domain has its

own research needs. Political scientists need to conduct practical political research, mainly associated with public opinion, elections, and international relations. In law, jurists are concerned with investigating public attitudes towards social problems, such as crime and social issues. The most homogeneous domain, medical science, focuses on public health and changes in health behaviour. These results have implications for the design of information services targeting specific users and for providing a guideline for scholars to select and gather TV content. The profiles of the users are very important because this factor affects the selection and use of information (Hjørland and Albrechtsen, 1995; Kling and Covi, 1997; Savolainen, 1995; Talja and Maula, 2003). Following this stream of research, we postulate that the use of the TV content by scholars depends on their academic domain, and therefore, the domain analysis is useful for discovering new academic user groups and their information needs. Theoretically, this study extends the horizon of domain analytical research on scholarly communication.

(3) The motivations for using TV content originate from the following four situations: research on the social environment; the use of either formal or informal communication; the familiarity of scholars with the media and related information; and the influence of their institutional context, such as government policy or academia. In many cases, scholars who use TV content tend to be interested in social trends, human behaviour, and popular culture. They need the TV content in various stages of their research process. Some scholars even use TV content as an example or a reference when they need to support their arguments, especially in relation to public culture and current affairs. This contextual information regarding user needs can be used to create guidelines for planning collections in TV archives, as well as in libraries and information centres.

(4) The different patterns of using the TV content for each research stage also emerged. During the problem stage, scholars use TV content to generate ideas and define the research problem. Their encountering and browsing behaviours preceded their capturing and monitoring behaviours. During the methodology stage of their research, the pattern of use of TV content are focused on data gathering and processing. During the presentation stage, scholars mainly employ the TV content for statistical analysis and content analysis. Many of these scholars also use TV content to support their arguments. These findings have implications for planning more user-oriented interfaces and applications for personalised information systems and services.

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