

Mining for Data: Assessing the Use of Online Research

Hilary Edelstein, PhD Candidate

Ontario Institute for Studies in Education, University of Toronto
Department of Theory and Policy Studies
6th floor, 252 Bloor Street West, Toronto, ON
M5S 1V6
Canada

Saira Shah, PhD student

Department of Educational Administration program
Ontario Institute for Studies in Education
Canada

Dr. Ben Levin

Professor and Canada Research Chair
Department of Education Leadership and Policy
Ontario Institute for Studies in Education
Canada

Abstract

This paper provides evidence on the way that people use research resources posted on websites. Although the Internet is now 'the' main point of access to research findings, little is known about how it is used to this end. The research reported here has gradually developed some analytical tools for this purpose. We use data from Google Analytics and from a survey of website visitors to describe some of the patterns in the ways that people interact with these resources. Each data source has its own story; together the data can help us understand how organizations and individuals use, or do not use, education research online. We conclude with some implications for practice.

Key Words: Knowledge mobilization, research use, Internet, online research, research dissemination

1 Introduction

[Please note, after blind peer review, this paper will be modified and identifying factors will replace phrases like 'our research team', 'our team' and 'our program']

Knowledge mobilization (KM) is the bridging process between research, policy and practice (Levin, 2011; Nutley, Walter, & Davies, 2007). Although issues of collaboration and conducting research are a large part of the process (Edelstein & Levin, 2011) a central question is: How is research evidence disseminated to those who need it? The accessibility of reliable research evidence often comes from a few clicks on the Internet rather than spending countless hours in a library. This shows how much the Internet has infiltrated our day-to-day lives and changed the way that researchers and information seekers look for and at research (Duffy, 2000; Jadad, et al., 2000). Our research team thought about how we, as well as other researchers and educational organizations are using the Internet as their primary tool both for disseminating and finding research (Hartley & Bendixen, 2001; Greenhow, Robelia, & Hughes, 2009; Qi & Levin, 2010). We have gradually developed a study that is almost entirely conducted online using a variety of information technology tools to collect data, communicate with partners and analyze data to understand the uptake of web-based research materials.

The Use of Online Research (UOR) project examines web-based dissemination and collaboration strategies to understand knowledge mobilization in a world where accessing the Internet is often easier than accessing a library. Our primary interest is in obtaining a deeper understanding into how people access research through their visits to educational websites. This project is grounded in a typology that divides research mobilization strategies into three key categories: Products, events and networks (Sà, Faubert, Qi & Edelstein, in press; Qi & Levin, 2010).

In this typology, the product category includes such things as research reports, videos, and research summaries; the event category includes various forms of in-person or online events as well as follow-up from previous events and information about future events; finally the network category includes efforts to build ongoing relationships between producers of knowledge, knowledge intermediaries and knowledge users.

The UOR project is focused on the product category of this typology, which our earlier work (Sà, Faubert, Qi & Edelstein, in press; Qi & Levin, 2010) tells us is the most common approach to knowledge mobilization. That is, research organizations including universities that still rely heavily on various forms of documents or audio-visual reports as their primary means of sharing their research online with a broad audience. The goal of the project is to identify whether and how much visitors to these websites use certain research related products, and if so, how visitors are using the products. Therefore, the key question guiding our study is: How much and by whom are web-based research findings being accessed and used?

2 Literature Review

Our literature review is organized around two themes of the UOR project: Knowledge mobilization and the use of the Internet. First we explain the broader literature on knowledge mobilization, including its cross-sector relevance and why it is important to the field of education. Then we review the literature relating to how researchers and research organizations are or are not reaching users with the evidence they are producing. In the second half of the literature review we explore why the Internet is an integral piece for disseminating research, the challenges with using the Internet to disseminate research and how researchers have been using the Internet to study users' online habits.

2.1 Knowledge mobilization

Knowledge Mobilization (KM) refers to the multiple ways in which stronger connections may be made between research, policy and practice (Bennet & Bennet, 2007; Cooper, Levin & Campbell, 2009; Levin, 2011). KM permeates many fields such as education, health, and social work (Davies, Nutley, & Smith, 2000). There is considerable confusion in the terminology relating to KM. With interest in knowledge mobilization rising across sectors, so too have the terms to describe this connection between research and practice. Common terms for knowledge mobilization include: Research dissemination; knowledge transfer; knowledge translation; and knowledge utilization (Lavis et al., 2003; Sudsawad, 2007; Estabrooks, 1999; Hemsley-Brown & Sharp, 2003; Weiss, 1979; Graham et al., 2006). For the purposes of this paper KM will be used to define the mobilization of evidence between researchers and practitioners.

Current efforts to improve connections between research, policy and practice are gaining prominence, but leading researchers are still asking questions about how these connections can be improved (Nutley, Walter, & Davies, 2007; Sebba, 2007; Levin, 2011).

Practitioners in many professions are expected to use research to inform their practices, but in many cases researchers find that practitioners are not using the best evidence or that practice lags considerably behind the research (Levin & Edelstein, 2010; Mitton et al., 2007; Maynard, 2007; Dobbins et al., 2007). Moving research into practice means that many practitioners will be faced with the understanding, the often hard to accept, that many of their current practices are based on beliefs, intuition, or personal and collective experiences that are inconsistent with good evidence (Milton, 2006; Levin & Edelstein, 2010). In these cases education research needs to be reconciled with practitioners' current practice (Davies, 1999; Hiebert et al., 2002; Levin & Edelstein, 2010). The belief that practitioners ought to use research evidence is based on the idea that "evidence-based approaches (ie. an intervention program, approach, or policy that has resulted in improved outcomes when tested through research), when implemented in a real world setting, will increase the likelihood of improved outcomes" (Kerner & Hall, 2009, p. 519).

2.2 How to Reach Users

Applied research organizations and universities spend a great deal of time generating research knowledge that could be of use to practitioners and decision makers. This research knowledge often does not reach these potential users (Maynard, 2007). Research outputs must take numerous forms to have the most impact by reaching a larger audience in the education sector. Cordingley (2009) describes how researchers should use clear, simple and jargon-free writing, as well as providing a sufficient and detailed analysis of specific teaching interventions or knowledge in action that allow teachers to connect with the material and test it out themselves.

For research to meet user needs effectively, the target audience needs to be clearly identified while the “specifics of a knowledge-transfer strategy [though we do not think of it as ‘transfer’, which is a one-way concept] must be fine-tuned to the types of decisions they face and the types of decision-making environments in which they live or work” (Lavis, et al., 2003, p. 224).

2.3 Dissemination in knowledge mobilization

Effective dissemination strategies for research are essential for evidenced-based practices. In clinical settings, the connection between research and practice is well developed. Kerner & Hall (2009) observe that “new information management technologies like the electronic medical record (EMR; with information from the practice) and the electronic health record (EHR; with information from the patient), hold the promise of providing real-time communication between practitioners and their patients, as well as providing the opportunity to disseminate to practitioners, at the point of patient contact, key decision aids based on patient-specific information such as test results or patients self-reported health status” (p. 525).

There is a large body of research in the health care sector dedicated to the dissemination of research findings to practitioners (Kerner & Hall, 2009; Oermann, et al., 2010; Muttiah, Georges & Brackenbury, 2011; Lavis, et al., 2005; Walshe & Rundall, 2001; Oxman, et al., 1995). Although in health care significant gaps still exist between evidence and practice, it has a research culture with wide acceptance of the need for evidence to inform practices (Davies, Nutley, & Smith, 2000). Contrasting this to the education sector, Levin (2011) describes how most education delivery organizations such as schools and districts have weak capacities to share, understand and apply research. Levin (2011) further explains how the channels for bringing evidence into practice are weak in spite of the availability of substantial research evidence.

Supporting infrastructure like websites and newsletters may increase the interactivity between producers and users, particularly when the evidence is targeted towards certain audiences or is in a searchable format (Lavis, et al., 2003). Duffy (2000) explains how research and development strategies and research programs are starting to commit to the dissemination of information and have begun turning to the Internet as a vehicle to enable dissemination. However, there is still little empirical documentation that provides evidence as to how KM happens online and if sharing research through the Internet is an effective means of dissemination. As a result, this study turns to the Internet to understand if visitors to research organizations’ websites are sharing the research they find online.

2.4 Why the Internet?

In the age of information technology, the Internet is an ideal place for posting, discussing and disseminating research knowledge. While literature from the education sector on this topic is sparse, literature from the health care and business management sectors about the influence of the Internet on the knowledge mobilization process can help inform what is happening in the education sector. This literature explores the Internet as an important push tool for disseminating research knowledge (Davies, Nutley, & Smith, 2000; Bennet & Bennet, 2007; Jadad et al., 2000; Morahan-Martin, 2004; Ho, et al., 2003; Rajani & Chandio, 2004; Dede, 2003; Skok & Kalmanovitch, 2005).

As an open portal, or the “world’s largest library” (Morahan-Martin, 2006, p.497-498), the Internet serves as a medium for conveying information that can readily reach a wider and more diverse audience “at the right place, in the right amount and in the format” (Jadad et al., 2000, p.362-363). Ho, Chockalingam, Best and Walsh (2003) say that the Internet is not just about getting data at the right place, time or in the right format, it is also about navigating the increasing challenge of keeping up with current knowledge and the ability to integrate it into practice (p.710). Duffy (2000) describes how the Internet serves as an outlet capturing research material that may not meet the specifications of traditional journals and print publications. He also discusses how online networking can disseminate research ideas and information before articles reach a printed format (Duffy, 2000, p.350). Dede (2000) posits that finding and using online research can challenge practitioner’s assumptions, values and culture by engaging them in online networks where practitioners can discuss new research to inform their decision-making practices. In this perspective, Dede (2000) emphasizes the importance of interpersonal connections, not just in the delivery of information but as an essential aspect to changing the way people work.

Although engaging in networks to discuss new research stemming from the Internet and using the Internet as a tool for finding and disseminating research can help facilitate disseminating research to practice, there are issues of unreliable research and inequitable access to the Internet (Morahan-Martin, 2006; Duffy, 2000; Roberts, 2000; Bennet & Bennet, 2004). Even though these authors do not address how to make the Internet more accessible, they do provide some suggestions for sorting through research online. For example, Shah, Kwak, and Holbert (2001), Morahan-Martin (2006), and Ardengo (2008) call for users who are seeking research online to be vigilant about the search terms they use, how many citations they look at online, and being aware of who is writing the research products. They suggest that these measures as well as being critical of what the user finds online will protect the user from being taken in by faulty research.

2.5 Studying the use of online research

To study the use of online research, researchers are beginning to use cybermetrics, “a branch of knowledge which employs mathematical and statistical techniques to quantify web sites or their components and concepts” to aide in understanding how visitors to websites navigate the site and what they might take away from a site (Jana & Chatterjee, 2004). Clifton (2008), Ledford and Tyler (2007) and Phippen, Sheppard and Furnell (2004) suggest that studying web metrics can provide clues for how visitors use websites by examining the search terms visitors use to enter and how they navigate a website. However, Weischedel and Huzingh (2006) caution that using cybermetrics and web metrics alone cannot provide a depth of knowledge about why visitors are coming to a site. As a result, Stanton and Rogelberg (2001) suggest designing surveys or other mechanisms that ask and measure visitor data that cannot be determined through web metrics alone.

Due to the newness of this research, there are few empirical studies. One, by Shak, Kwak and Holbert (2001) examines the use of the Internet and engagement in a social civic life (p.141-142). They examine how people use the Internet by disaggregating their study populations online practices by civic engagement criteria, including “engagement in community activities, trust in others, and life satisfaction” (Shah, Kwak, & Holbert, 2001, p.142). They believe that the Internet “allows users to gain knowledge, build linkages, and coordinate their actions to address joint concerns” around civic issues (Shah, Kwak, & Holbert, 2001, p.144). As part of their study, they consider four components of Internet use: Social recreation, product consumption, financial management, and information exchange (p.148). In their study the use of the Internet for information exchange had a positive impact on civic engagement (Shah, Kwak, & Holbert, 2001, p.149). Similarly, in our studies on knowledge mobilization and using the Internet as a place for gathering and disseminating research evidence, we are looking at the impact on changing education practice.

3 Conceptual Framework

Our study of the use of online research focuses on three facets (Figure 1):

- 1) Research evidence: Various aspects of the research products influence use.
 - Type of resource (idea, product, contact, link)
 - Format (long or short print version, video, language)
 - Relevance (how tailored to particular users)
- 2) User:
 - Role (parent, teacher, student, researcher, district administrator, journalist, interested citizen)
 - Purpose of visit to website (work, study, personal reasons)
- 3) Actual use over time: Comparing original intention to actual use.
 - Use over time (no use, undetermined usefulness, immediately useful, intended future use, actually used)
 - Sharing of materials (formally and informally; internally or externally to their workplace)
 - Type of use (conceptual, symbolic, and instrumental)

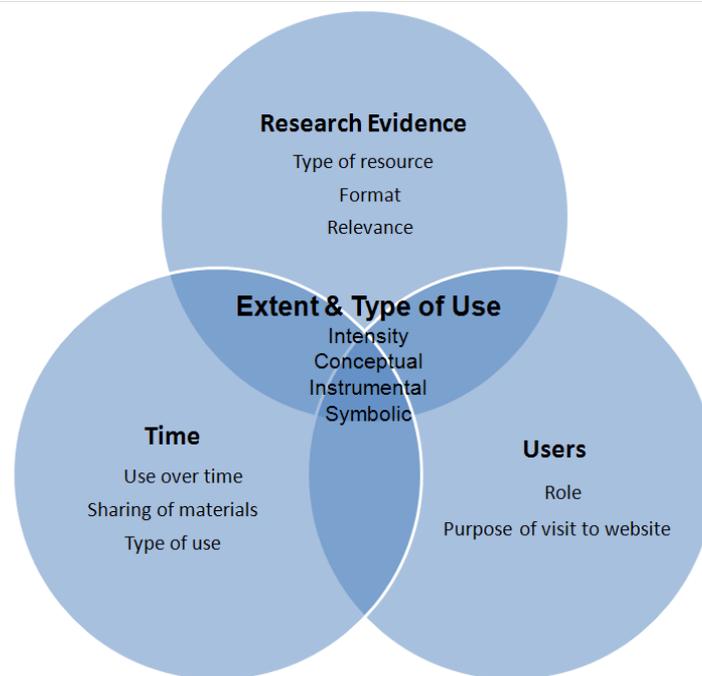


Figure 1. Conceptual framework showing the interrelation between research evidence, context and time. (See also Cooper, Edelstein, Levin & Leung, 2010)

3 Methodology

Table 1 gives an overview of our data sources, sample, methodology, and data analysis.

Table 1. Overview of methodology

Research Facet	Data sources	Sample	Method	Data analysis & outputs
Actual use of research over time from websites.	Website usage data	9 partners from 3 different countries (5 Canadian, 1 New Zealand, 3UK)	Google Analytics for website usage: page views, bounce rate, new and repeat visitors, landing, entrance, exit page, and time spent on page.	Cross-case analysis of data using Excel.
Actual use of research over time from web-based materials.	Product download data	Same as above	Google Analytics for downloads: page view, time one page, bounce rate. Product typology chart to understand the range of products available online. Identifying product types for research use.	Analysis framework will be created based on the typology chart and the products specified for research use Cross-case analysis using Google Analytics data to understand use over time (comparing use over time)
How research products influence use.	Survey data	12 partners from 3 different countries (6 Canadian, 1 New Zealand, 5 UK)	Initial survey	Descriptive data. Themes from long answer questions.
Role and purpose of the user's visit.		Respondents to the initial survey	Follow-up survey	Descriptive data. Themes from long answer questions.

At this time, we have a dozen partners from across Canada, the UK, and New Zealand. The Canadian partners include a university research group, not-for-profit organizations, government organizations, and a school board research group. The UK partners include different government and university funded research organizations, while the New Zealand partner is a government run research branch. Although there are five UK partners, only three of these partners opted to participate in the Google Analytics portion of our project, while the other two are only participating in the survey portion of the project. Similarly, one of the Canadian organizations has opted to only participate in the survey. We do not identify the partner organizations by name due to anonymity as requested by the partners. In the Google Analytics findings section, we refer to the partners by number (Organization 1, 2, 3, etc) and research page designation (Organization 1 has three identified research pages; these are referred to as page 1.1; 1.2; and 1.3).

4 Data Sources

In order to understand how visitors to websites of various educational organizations use research related products, we are assessing two key data sources: Google Analytics data and survey data.

5 Google Analytics findings

The purpose of analyzing the website use data was to improve our understanding of the way various research products are used. Given the lack of previous research in this area, there were virtually limitless places to start. Here we present some of our initial analysis, which is inductive based on what we can understand from the data available on each of the partner organizations. Since we could not find previous studies of this kind, we had to develop an approach to using the data to understand the use of these sites.

We use Google Analytics (GA) to analyze the website use by examining specific metrics. The metrics we look at are: Visits, visitors, page views, pages viewed per visit, average time on site, bounce rate, percent of new visitors, top landing page, and downloads or specified products. Each partner organization identified specific pages where it had research resources for more intensive investigation. We calculated visitors who view the homepage and specific research pages as a percent of all visitors, as well as analyzing repeat visitors to the identified research pages.

We chose GA over other analytic software tools due to ease of access, availability and the resources available on GA to help us conduct our analysis (Ledford & Taylor, 2007). We use GA to analyze our data based on the following frameworks as shown in figure 2 and table 2:

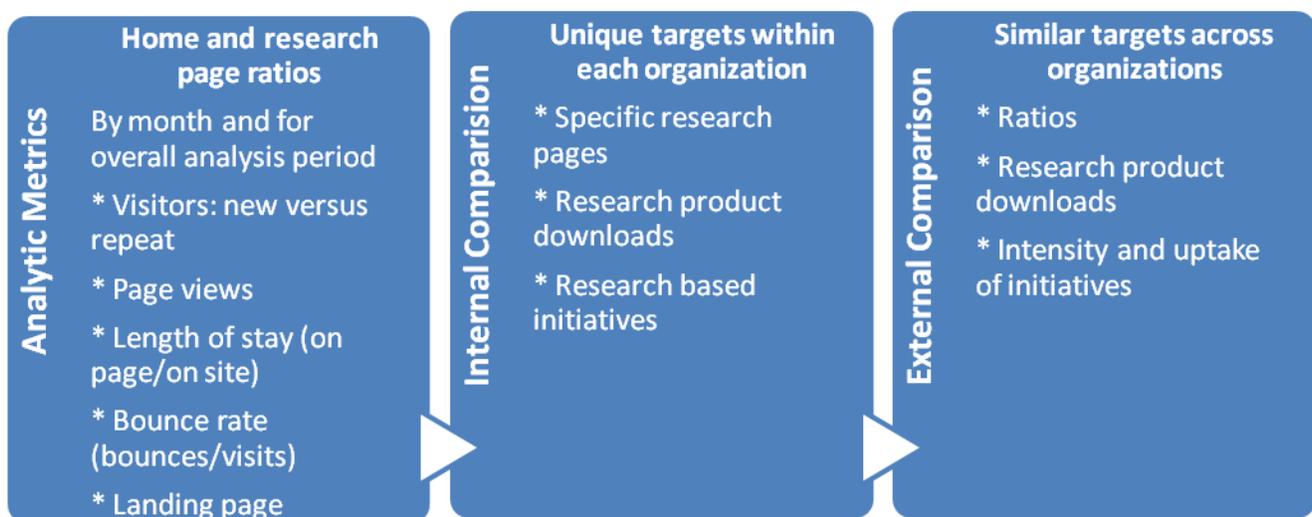


Figure 2. Analysis framework showing analytic metrics, internal comparison and across organization comparison

Table 2. Definition of common metrics from Google Analytics (2010)

Web Metric	Definition
Visits	Visits represent the number of individual sessions initiated by all the visitors to a site.
Visitors	Visitors are unique people identified by unique visitor cookies. "Visitors" or "unique visitors" refers to the count of visitor ID's that viewed the site during the selected date range. The initial session by a user during any given date range is considered to be an additional <i>visit</i> and an additional visitor. Any future sessions from the same user during the selected time period are counted as additional visits, but not as additional visitors. For example, if someone visits the site 3 times in a month that would count for one visitor and 3 visits.
Time on site	Provides an average time that each visitor spent on the site per day. This may not mean time looking at the site but only time that the page was open on the visiting computer.
Bounce rate	Provides a percentage of how many visitors on that day bounced off the site within a few seconds of coming. From this statistic, we could presume that the visitor did not find what they were looking for, or that it was the wrong site.
Average page views	The average number of pages each visitor viewed .
Repeat visits	Visitors who come back to the website or a particular page.
Exits	This metric identifies the number of exits from a particular page, and, as with entrances, it will always be equal to the number of visits when applied over an entire website. Use this metric in combination with particular content pages in order to determine the number of times that particular page was the last one viewed by visitors. A percent of exit (% exit) is the percentage of site exits that occurred from a page or set of pages.
Landing page	The page that a visitor comes to first when entering a website.
Entrances	This metric identifies the number of times a particular page served as an entrance to your site.

5.1 Website data analysis

Our website use data analysis is reported in the following categories:

- (1) Overall site use
- (2) Homepage use
- (3) Research page use

We use a set of codes in the following tables. PgV refers to page views, R to research pages, TR to total research pages, H to homepage and O to overall site usage.

5.2 Overall site usage analysis

Table 3 reports data from our partners on major metrics from June 2010 through May 2011 where available. Although not all of our partners have been with us that long, and some for longer (since October 2009), we can track backwards for website usage data. According to the methodology table (See table 1), we have a total of 9 partners for the Google Analytics data analysis portion of the UOR project. Each partner joined Google Analytics at different times. Therefore, although we have twelve month's data for most partners (n=6), we have seven months of data for one partner and five months of data for two partners. We therefore report data per month.

Table 3. Overall website usage

Organization	1	2	3	4	5	6	7	8	9	Min	M	Max	SD
Total pages (June 1, 2010-May 31, 2011)	2724	4400	2704	94	14605	2027	327	868	729				
Months of data	12	7	12	12	5	12	12	12	5				
Overall visits/month	8646	39709	12327	375	30608	9998	2888	1951	2380	375	12098	39709	13879.045
Overall visitors/month	7593	31860	11662	305	26721	8938	2713	1607	1821	305	10358	31860	11458.695
Overall page views/month	24812	103429	23808	1049	85132	34403	9639	9198	5200	1049	34074	103429	35831.262
Page views per visit/month	3	3	2	3	3	3	3	5	6	2	3	6	1.202
Overall average time on site	29:01	13:10	13:10	29:03	12:53	32:33	30:54	44:09	26:26	12:53	25:42	0:44:09	
Overall bounce rate (%)	57.28	59.48	72.40	59.89	61.82	62.00	39.11	42.55	37.48	37.48	54.67	72.40	12.046
Overall % new visits	71.28	57.34	75.36	52.99	66.02	73.43	82.40	58.00	49.10	49.10	65.10	82.40	0.113
Months of downloads	6	2	0	12	5	12	12	1	0				
Total downloads	3637	6323	0	274	106	507	3471	542	0	0	1651	6323	2273.696

Table 3 demonstrates that the websites vary greatly in size and amount of traffic, and indeed across all the metrics and indicators. The largest sites have hundreds of times more pages and visitors than the smallest sites. However time on site, although it also varies greatly, does not seem higher for larger sites and bounce rates seem lower on the smaller sites. Organization 1, 4, 6, 7, 8, 9, and 10 can be classified as research-based organizations with disseminating research to practice as a priority in their mission statements. Organizations 2, 3, and 5 are broader purpose organizations where research dissemination is just one priority. Their web sites are more geared towards non-research related information.

Table 4. Do visitors view the homepage?

Organization	1	2	3	4	5	6	7	8	9	M	SD
H_PgV/O_PgV (%)	3.4	25.3	22.1	15.3	5.7	8.2	8.8	24.5	7.1	13.4	8.6
H_PgV/O_V (%)	11.25	81.98	45.07	52.65	18.32	31.63	31.14	71.42	59.51	44.77	23.9
Entrances to homepage by overall page views (%)	2.43	19.78	15.94	11.92	3.75	5.9	6.87	7.91	2.36	9	6.1

Table 4 provides information about the extent to which the homepage is viewed across organizations. The first row is homepage page views as a percent of overall website page views. The second row is the percent of overall visitors who view the homepage. The third row indicates the percentage of visitors who enter the website through the homepage compared to other pages.

These data indicate that on some sites relatively few visitors ever go to the homepage. Overall these data suggest that home pages are not the main focus of visitors, and may not be seen at all by many or most visitors. One implication of this finding is that sites should not assume that their home page is the primary organizing vehicle for visitors, and that a site should be easy to understand and navigate from any starting point.

Table 5. Cross-case analysis

Organiz ation	Months of data	Page	Page description	Page views/m onth	Visits/ month	Average time on page	Total visitors to visits of the subpages (%)	Repeat visitors (%)
1	12	1.1	Overview of research	214	10	00:46	0.1	1.13
		1.2	Specific research page	258	92	00:47	1.2	1.02
		1.3	Specific research page	35	5	01:11	0.1	0.17
		1.4	Publications	469	24	00:42	0.3	2.46
		1.5	Blog	330	77	01:49	1.0	1.63
2	7	2.1	General research page	132	32	00:56	0.1	0.13
		2.2	Specific research page	105	44	02:25	0.1	0.08
		2.3	Specific research page	154	30	01:20	0.1	0.17
3	12	3.1	Specific research page	41	7	00:26	0.1	0.27
		3.2	Specific research page	4	0	01:13	0.0	0.03
		3.3	Specific research page	12	8	02:46	0.1	0.03
		3.4	Specific research page	16	6	01:40	0.1	0.08
4	12	4.1	Overview of research	28	5	00:31	1.7	2.80
		4.2	Products	62	2	00:18	0.7	7.21
		4.3	Events	21	1	00:34	0.4	2.40
		4.4	Networks	16	1	00:37	0.2	1.86
		4.5	Publications and reports	78	22	01:21	7.1	7.95
		4.6	Tools	5	1	00:21	0.2	0.55
		4.7	Specific research page	7	2	01:17	0.8	0.65
		4.8	Specific research page	6	1	01:27	0.4	0.64
		4.9	Specific research page	16	5	02:09	1.8	1.48
		4.10	Specific research page	135	92	01:46	30.1	10.45
		4.11	Specific research page	5	0	00:54	0.1	0.50
5	5	5.1	Specific research page	307	238	04:20	0.9	0.21
		5.2	Specific research page	385	175	03:51	0.7	0.40
6	12	6.1	Publications	1041	37	27:01	0.4	3.79
		6.2	How to use page	369	24	09:31	0.3	1.30
		6.3	Specific research page	19	9	55:24	0.1	0.05
		6.4	Specific research page	29	13	54:36	0.2	0.07
7	12	7.1	Specific research page	12	2	02:21	0.1	0.14
		7.2	Specific research page	26	18	02:17	0.7	0.18
		7.3	Specific research page	19	2	01:06	0.1	0.24
		7.4	Specific research page	21	12	00:43	0.4	0.13
		7.5	Specific research page	18	2	00:32	0.1	0.24
8	12	8.1	Specific research page	553	235	01:01	14.6	4.76
		8.2	Specific research page	97	19	01:44	1.2	1.08
9	5	9.1	Overview of research	234	5	00:42	0.3	1.66
		9.2	Research publications	922	23	00:42	1.3	6.54

Our cross-case analysis as shown in Table 5 provided information on the use of identified sub-pages on each partner website. Variability across pages and organizations is high. One striking observation is that the identified research pages get very small numbers of visitors relative to the site as a whole, in many cases getting less than 1% of total visitors. Although this is not surprising considering that some sites have thousands of pages (see table 3), it does suggest that the resources going to these pages are not necessarily well used. This finding fits with other research that indicates that passive availability of research is not an effective dissemination strategy compared with active outreach (i.e. through personal connections). Other findings include the number of visitors who enter the website onto the identified subpages. Visitors who enter the site on specific pages range from less than 3% of visitors to the total site entering on an identified page to over 70% of visitors to a site landing on a specific page although mean number of visitors who land on the identified research pages is 15%.

Cross-organization comparison raises some interesting similarities and differences. On average visitors do not seem to spend much time on certain identified pages, spending less than one minute on a page with some pages being viewed for an average time of 20 seconds or less. On some pages, however, visitors are spending about 2-4 minutes on a page, with the unusual exception of organization 6 whose pages have average times on the page of 27 minutes (6.1); 55 minutes (6.3) and 54 minutes (6.4). We are pursuing this further with the reasons for this anomaly. In our cross-case analysis we also looked at the percentage of repeat visitors to each subpage. The percentage of repeat visitors is quite low, with the majority of identified web pages attracting less than 10% of repeat visitors.

7 Survey data

The Use of online research project has twelve partners on whose websites the surveys are embedded.

The first survey is posted on our partner organizations' websites on multiple web pages to increase the chance that visitors to the site will see and participate in the survey. Some organizations (i.e. Organization 1), promoted the survey through a listserv and member newsletter. The results of this initial survey will help us to understand visitor's intentions: what relevant research information they found, what they plan to do with that information, how they think it will inform their current and future work, and if they plan to use the research formally or informally within and outside of their workplace. The second survey is provided to respondents who agreed in completing the first survey to be emailed a follow-up approximately 30 days later. The second survey asks about what respondents actually did with the research related products that they previously found on our partner websites, and what impact it had on them and for their organization.

7.1 Survey findings

The first survey was accessed 350 times as of early May, 2011. After removing the blank surveys (n=101) and the surveys where respondents did not give consent to participate in the study (n=16), 233 surveys remained. Most of our partners' websites have had the survey embedded since April 2010, while 3 have only collected responses since January 2011. Response rates to this survey on all sites have been very low therefore we cannot be confident that the responses represent typical visitors to the sites. We have now redesigned the first survey as a quiz or game to see if that will increase the response rate. The response rate to the follow-up survey, as of May 2011, was very low (complete surveys N=41) out of a total of 48 surveys. Therefore we report only briefly on the follow-up findings here. We will be conducting another analysis when the number of response warrants.

Primary Roles

We asked respondents to indicate their primary role in coming to the website. We provided respondents with the following choices: Parent, teacher, student, researcher, school or college administrator, school mental health professional, community mental health professional, early year's leader, children's service leader, journalist, interested citizen, governor, policy, local authority officer and other. The set of possible roles was broadened as a result of the interests of some of our partners. Some of these categories (governor, local authority officer) are specific to the UK education sector and were requested by our UK partners. The biggest single category of respondents were researchers (n=91; 39%), followed by teachers (n=57; 25%), students (n=39; 17%) and others (n=38; 16%).

Interesting Findings

81% (n=154) of the respondents found information on the websites that was interesting or useful, while only 3% (n=6) disagreed and 15% (n=29) were not sure.

Surprisingly, of the 223 responses to this question, 63% (n=141) said that they would not refer others to this website while only 37% (n=83) said that they would.

Perceived impact of useful information from sites

The first item in the set of questions around impact of information, ‘This item is of immediate and practical importance’, had a mean of 1.6. This indicates that the most interesting idea, product, link, or contact that respondents found on the site was generally of great importance to them. The question about whether this item would ‘inform current research, course teaching or development’ had a mean of 1.7. While the question on ‘I will read/think more about this item before I determine its implications’ had a mean of 1.8. ‘This information will affect the way I do my work in the future’ and ‘The information will affect the way I think about other issues’ both had a mean of 1.9.

The questions about formal and informal sharing through meetings, discussions, action agendas, sharing via word of mouth or e-mail, were intended to assess people’s intentions to share the information they found useful on these sites with others in or beyond their workplace. Among respondents, there was a preference for sharing results informally (‘I will informally share this information with others at my workplace’, $M=2.8$, 53% agreed with the statement, and ‘I will informally share this information with others outside of my workplace’ $M=2.7$, 53% agreed with the statement). On the other hand, there were slightly less respondents who would be willing to share what they found formally (‘I will formally share this information with others at my workplace’ $M=1.8$, 50% agreed with the statement and ‘I will formally share this information with others outside of my workplace’ $M=2$, 40% agreed with the statement).

7.2 Follow Up Survey

Although we only have a small number of follow-up studies, three themes have emerged from these very preliminary data.

First, contrary to the intentions expressed in the initial survey, informal sharing rates are reported in the follow-up as higher than formal sharing rates.

Second, when participants were asked about how important the information they found from their visit to the website was for them personally, out of those that responded to the question (n=17), the majority (n=12) felt that the information was very important (n=5) or important (n=7). Similarly, when asked how important the information was in affecting the work their organization did, 82% of respondents believed that the information was very important (n=4) or important (n=10). Third, 47% (n=17) stated that they have used content from the website. Another 25% (n=9) had not yet used the content from the website, but intended to use it in the future while 28% (n=10) said they have not used content from the website and did not intend to use it in the future. These rates are somewhat lower than the initial survey, and since this group of respondents is likely to be more motivated than average, they suggest that actual use of online materials will be lower than in the first survey of measuring intention of use.

8 Discussion & Conclusion

An important feature of this project is our collaborative work with our partners. We share all our data and analysis with all partners and invite their comment through e-mail and occasional audio-conferences. Our partners have made many suggestions during the project that have improved our understanding of the data we have generated; that interaction continues. This preliminary analysis of our data suggests several findings. First, there are very significant differences between the various sites in terms of their overall size and the role that communication of research plays in them, even though all partners in this project regard research communication as an important part of what they do. In virtually all cases, relatively few people are visiting the identified research pages, suggesting that the provision of information on websites, even when the sites overall have very large amounts of traffic, does not yield very much in the way of take-up. In the next phase of the study we will be looking at various ‘push’ mechanisms that organizations may use to promote their research resources, ranging from RSS feeds to newsletters to links on higher profile pages or other sites. We are also now tracking the number of downloads of specific research products as another indicator of the value of websites as a means of research dissemination. Another finding is that most traffic to sites and to particular pages does not come from site home pages but from elsewhere on the Internet. This suggests that profiles on search engines or external links is likely more important to generating use than is the construction of a home page or a site navigation system.

Although, in most cases we suspect that organizations give much more attention to the latter than to the former. Again, in future analysis we will be doing more work on where visitors to research pages come from. On the other hand, it may be that site organization and navigation are important in helping visitors find useful resources and that if these were improved, traffic to research pages might increase. Respondents to our survey, though not necessarily representative of all visitors, are reporting that what they find online is important and that they do share it, even if informally. If we can raise the response rate to the survey and generate more follow-up surveys these data will become more reliable and useful. We are working with our partners on various options to improve these response rates.

In sum, although the Internet has become a primary access point for research, our analysis shows that online uptake of research is not as robust as might be thought. Passive strategies of information provision do not, based on these data, seem very effective or efficient, and our findings suggest that organizations interested in sharing research need more active knowledge mobilization strategies.

References

- Amara, N., Ouimet, M., & Landry, R. (2004). New evidence on instrumental, conceptual, and symbolic utilization of university research in government agencies. *Science Communication*, 26(1), 75-106.
- Arduengo, M. (2008). Evaluating the effectiveness of scientific material published on the web. *Science Editor*, 31(3), 83-84.
- Bennet, A., and Bennet, D. (2007). *Knowledge mobilization in the social sciences and humanities: Moving from research to action*. MQI PRESS: Virginia
- Bennet, A., & Bennet, D. (2004). *Organizational survival in the new world: The intelligent complex adaptive system*. Butterworth-Heinemann: Boston.
- Bielak, A. (February 9, 2011). *An evolution of the knowledge business*. Paper presented at the Ontario Education Research Symposium. Toronto, ON.
- Cooper, A., Levin, B., and Campbell, C. (2009). The growing (but still limited) importance of evidence in education policy and practice. *Journal of Educational Change*, 10, 159-171.
- Cooper, A., Edelstein, H., Levin, B., & Leung, J. (May 2010). Use of web-based research materials in education: Is uptake occurring? *Paper presented at the 39th Annual Canadian Society for the Study of Education Conference*. Montreal, ON.
- Cordingley, P. (2009). Research and evidence-informed practice focusing on practice and practitioners. *Cambridge Journal of Education*, 38 (1), 37-52.
- Clifton, B. (2008). *Advanced web metrics with Google analytics*. Indianapolis: Wiley Publishing Inc.
- Davies, H.T.O., Nutley, S., Smith, P. (2000). *What works: Evidence-based policy and practice in public services*. The Policy Press: University of Bristol.
- Davies, P. (1999). What is evidence-based education. *British Journal of Educational Studies*, 47 (2), 108-121.
- Dede, C. (2000). The role of emerging technologies for knowledge mobilization, dissemination, and use in education, paper commissioned by the Office of Educational Research and Improvement, US Department of education. Retrieved February 2010 from http://www.virtual.gmu.edu/ss_pdf/knowlmob.pdf
- Dobbins, M., Rosenbaum, P., Plews, N., Law, M., Fysh, A. (2007). Information transfer: What do decision makers want and need from researchers? *Implementation Science*, 2 (20), 1-12.
- Duffy, M. (2000). The Internet as a research and dissemination resource. *Health Promotion International*, 15(4) 349-353.
- Edelstein, H., & Levin, B. (May 2011). Issues in conducting new research: Challenges and rewards. *Paper presented at the 40th Annual Canadian Society for the Study of Education Conference*. Fredericton, NB.
- Estabrooks, C. (1999). Modeling the individual determinants of research utilization. *Western Journal of Nursing Research*, 21 (6), 758-771.
- Graham, I., Logan, J., Harrison, M., Straus, S., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *The Journal of Continuing Education in the Health Professions*, 26 (1), 13-24.
- Greenhow, C., Robelia, B., & Hughes, J. (2009). Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, 38(4), 246-259.
- Hartley, K. & Bendixen, L. (2001). Educational Research in the Internet Age: Examining the Role of Individual Characteristics. *Educational Researcher*, 30(9): 22 - 26.
- Hemsley-Brown, J., and Sharp, C. (2003). The use of research to improve professional practice: A systematic review of the literature. *Oxford Review of Education*, 29 (4), 449-470.
- Hiebert, J., Gallimore, R., Stigler, J.W. (2002). A knowledge base for the teaching profession: What would it look like and how can we get one? *Educational Researcher*, 31(5), 3-15.
- Ho, K., Cockalingam, A., Best, A., & Walsh, G. (2003). Technology-enabled knowledge translation: Building a framework for collaboration. *Journal of Canadian Medical Association*. 710-711.

- Jadad, A. (1999). Promoting partnerships: Challenges for the Internet age, *BMJ*, 319, 761-764.
- Jadad, A., Haynes, R., Hunt, D., & Browman, G. (2000). The Internet and evidence-based decision-making: A needed synergy for efficient knowledge management in health care. *Journal of Canadian Medical Association*, 162(3). 362-365.
- Jana, S., & Chatterjee, S. (2004). Quantifying web-site visits using web statistics: An extended cybermetrics study. *Online Information Review*, 28(3). 191-199.
- Kerner & Hall (2009). Research dissemination and diffusion: Translation within science and society. *Research on Social Work Practice*, 19(5). 519-530.
- Lavis, J., Davies, H., Oxman, A., Denis, J., Golden-Biddle, K., Ewan Ferlie. (2005). Towards systematic reviews that inform health care management and policy-making. *Journal of Health Services Research & Policy*, 10(1), 35-48.
- Lavis, J., Robertson, D., Woodside, J., McLeod, C., Abelson, J. (2003). How can research organizations more effectively transfer research knowledge to decision makers. *The Millbank Quarterly*, 81 (2). 221-248.
- Ledford, J., and Tyler, M. (2007). Google analytics 2.0. Indianapolis: Wiley Publishing Inc.
- Levin, B. (2008). *Thinking about knowledge mobilization*. A Paper prepared for an invitational symposium sponsored by the Canadian Council on Learning and the Social Sciences and Humanities research Council of Canada.
- Levin, B. (2011). Mobilizing research knowledge in education. *London Review of Education*, 9(1), 15-26.
- Levin, B. and Edelstein, H. (2010). Research, policy and practice in education. *Education Canada*, 50 (2). Canadian Education Association: Toronto. 29-30.
- Maynard, A. (2007). Translating evidence into practice: why is it so difficult? *Public Money and Management*. 251-256.
- Milton, P. (2006). Opening minds to change the role of research in education. *Education Canada*, 47 (1). 39-42.
- Mitton, C., Adair, C., McKenzie, E., Patten, S., Perry, B. (2007). Knowledge transfer and exchange: Review and synthesis of the literature. *The Millbank Quarterly*, 85 (4). 729-768.
- Morahan-Martin, J. (2004). How Internet users find, evaluate, and use online health information: A cross-cultural review. *CyberPsychology & Behavior*, 7(5). 497-511.
- Muttiah, N., Georges, K., Brackenbury, T. (2011). Clinical Research Perspectives on Nonspeech Oral Motor Treatments and Evidence-Based Practice. *American Journal of Speech-Language Pathology*, 20. 47-59.
- Nutley, S., Walter, I., Davies, H.T.O. (2007). *Using evidence: How research can inform public services*. The Policy Press: University of Bristol.
- Oermann, M., Shaw-Kokot, J., Knafl, G., Dowell, J. (2010). Dissemination of research into clinical nursing literature. *Journal of Clinical Nursing*, 19. 3435-3442.
- Oxman, A., Thomson, M., Davis, D., Haynes, R., (1995). No Magic Bullets: A systematic review of 102 trials of intervention to improve professional practice. *Canadian Medical Association Journal*, 153. 1421-1431.
- Page, R. (2008). Web metrics 101: What do all these terms mean? Retrieved on November 3, 2009 from www.makeuseof.com/tag/web-metrics-101
- Phippen, A., Sheppard, L., & Furnell, S. (2004). A practical evaluation of web analytics. *Internet Research*, 14(4). 284-293.
- Qi, J. & Levin, B. (2010). *Strategies for mobilizing research knowledge: A conceptual model and its application*. Paper presented at the 39th Annual Canadian Society for the Study of Education Conference, Montreal, Quebec.
- Rajani, M.K., & Chandio, M.S. (2004). *Use of Internet and its effects on our society*. A paper presented for the National Conference on Emerging Technologies, Jamshoro, Pakistan.
- Roberts, J. (2000). From know-how to show-how? Questioning the role of information and communication technologies in knowledge transfer. *Technology Analysis & Strategic Management*, 12(4). 429-443.
- Research supporting practice in education (2011). Retrieved from www.oise.utoronto.ca/rspe on March 5, 2011.
- Sá, Creso; Faubert, Brenton; Qi, Jie; Edelstein, Hilary. (2010, In Press). Understanding how organizations use the Internet to mobilise knowledge: Findings from the field of education. *International Journal of Management in Education*.
- Sebba, J. (2007). Enhancing impact on policy-making through increasing user engagement in research. In L. Saunders (Ed.), *Educational research and policy-making*. London: Routledge.
- Shah, D., Kwak, N., & Holbert, L. (2001). "Connecting" and "disconnecting" with civic life: Patterns of Internet use and the production of social capital. *Political Communication*, 18(2). 141-162.
- Skok, W., & Kalmanovitch. (2005). Evaluating the role and effectiveness of an intranet in facilitating knowledge management: A case study at Surrey County Council. *Information & Management*, 42. 731-744.
- Stanton, J., & Rogelberg, S. (2001). Using Internet/intranet web pages to collect organizational research data. *Organizational Research Methods*, 4(3). 200-217.
- Sudsawad, P. (2007). *Knowledge translation: Introduction to models, strategies and measures*. Southwest Educational Development Laboratory, National Center for the Dissemination of Disability Research: Austin, TX.
- Walsh, K., & T.G. Rundall. (2011). Evidence-Based Management: From Theory to Practice in Health Care. *Millbank Quarterly*, 79(3). 429-57.
- Weischedel, B., & Huizingh, E. (2006). *Website optimization with web metrics: A case study*. Paper presented at ICEC, Fredericton, Canada.
- Weiss, C. (1979). The many meanings of research utilization. *Public Administration Review*, 39 (5). 426-431.