How is academic research being mobilized? A Scoping Review

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Abstract

K*[1] is an increasing priority for universities, research funders, and community and government organizations. As such, researchers must identify who to engage with their research, when and how to engage them, and determine whether their engagement has been successful. We conducted a scoping review of the literature to survey the extent to which researchers are attempting to engage end-users, and the methods they are using to do so. In this paper we summarize the methodology we employed to locate and analyze relevant research articles. We provide a quantitative overview of these articles based on domain, authorship, specific groups of end-users, and the format used to share research with them, and describe our qualitative inquiry into the ways in which the authors of the studies attempted to evaluate end-user engagement. The INKE 2020 lightning talk will emphasize the qualitative piece of this analysis, and how this scoping review will inform future work of our ongoing project, STOREE (Supporting Transparent and Open Research Engagement and Exchange).[2]

Introduction

The scholarly landscape is shifting. Funding agencies, university strategic plans,[3] and community-based manifestos (Boilevin, Chapman, Deane, et al., 2019) are signalling changing expectations of publicly funded research with regards to research access, accountability, and

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[1] Shaxson, Bielak, Ahmed, Brien et al. (2012) use the term "KStar" or "K*" as an "overarching concept" and "useful shorthand" (Foreword) for knowledge translation, knowledge mobilization, knowledge exchange, and so on.

[2] We are grateful for funding support from the Social Sciences and Humanities Council of Canada, and to our partners UBC Library, SFU Library, the UBC Learning Exchange and BCCSU.

[3] The University of British Columbia's newest strategic plan focused specifically on Knowledge Exchange (Strategy 9), and specifically seeks to "Improve the ecosystem that supports the translation of research into action." Available https://strategicplan.ubc.ca/strategy-9-knowledge-exchange/

societal impact. In Canada, recipients of Tri-Agency[4] funding are expected to communicate research to a wide range of beneficiaries, including "researchers, scholars, clinicians, policymakers, private sector and not-for-profit organizations and the public [to allow them to] use and build on this knowledge" (Government of Canada, 2016). Although the Tri-Council agencies specify different considerations for K* (Government of Canada, 2019a, 2019b, 2019c), the common undercurrent is that research should be accessible to and utilized by diverse members of society, and that researchers have a responsibility to ensure that this occurs. As such, there are increasing demands for scholars to publish research in open access venues, engage end-users at the end-of-grant stage (summative K*) or during the research process (formative or integrated K*), and find novel ways to communicate research results in non-academic formats.

As part of our ongoing research project, we are interested in how researchers have been responding to these demands, and whether there are disciplinary differences in this response. In this work we ask, "How is academic research being mobilized?" We undertook a systematic search of interdisciplinary literature to document and analyze how researchers are attempting to engage end-users in academic research, the modes in which they are communicating this research, and whether they are evaluating their efforts.

Methodology

We were interested in understanding the ways in which the following were described and utilized in scholarly articles: 1) the process of K*, recognizing the varied terminology (e.g., knowledge translation, mobilization); 2) knowledge users, such as practitioners, the general public, policy makers, or more targeted audiences such as parents, newcomers, and so on; and 3) modes of knowledge exchange.

We identified a range of subject-specific and aggregate databases: Medline; Business Source Complete; The Education Resources Information Center (ERIC); Library, Information Science & Technology Abstracts (LISTA); Communication and Mass Media Complete; and Web of Science Core Collection. We then generated search terms based on the aforementioned

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[4] The Tri-Council funding agencies (Tri-Agency), comprised of the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC), and the Social Sciences and Humanities Research Council (SSHRC).

areas of interest. We conducted three separate searches in each of the six databases for each of the main components (*search 1*: knowledge exchange and related terms; *search 2*: knowledge users; and *search 3*: mode of knowledge exchange) and later combined them using the Boolean operator AND. Search strings were constructed and applied in each of the six databases. Next, we examined the controlled vocabulary and keywords used within specific search tools, as well as the affordances offered by each database, such as wildcards, Boolean, and proximity operators. We used this information to modify the searches slightly to maximize recall and precision. We also conducted hand searching using citation chaining techniques, or "snowball methods" (e.g., Greenhalgh et al. 2004). Our strategies were appropriate given the multidisciplinary nature of the literature on knowledge exchange, and the lack of consensus on the terminology used to describe it across fields. This initial search in April 2019 yielded 306 total records; we did not limit by publication date. We removed duplicates and applied the following inclusion criteria to obtain 104 items:

- English language publications, due to lack of fluency in other languages;
- Scholarly, peer reviewed publications containing empirical research. Literature reviews were retained for hand searching the references lists, but were not eligible;
- Identification of a non-academic audience with whom research was being communicated in the paper;
- Specified mode of knowledge exchange, such as an instrument, practice, or media for sharing research.

We then conducted full-text review of the 104 articles and removed an additional 60 items that did not meet the inclusion criteria, leaving a final list of 44 articles for analysis.

Table 1 shows the type of information we extracted from each article, and the specific fields we created to capture this information. While we determined specific categories in advance, the fields shifted and new categories emerged as we engaged with the articles. We used OpenRefine software to examine categories and clean and refine the data. For example, we wanted to ensure we were using consistent terminology (e.g., "United Kingdom" vs. "UK" or "Britain). OpenRefine helped us to organize and make sense of the data we extracted from the articles in order to analyze and present the findings quantitatively, e.g., number/percent of articles in the sample by subject.

Table 1

Extract information by type and fields

Type of information	Specific fields
Bibliographic information	Article title; named authors; publication title; publication date; volume; issue; and page numbers
Author information	Institutional affiliations of the authors; country based on author affiliation; authors' area of specialization; academic or professional affiliation, e.g., professor, clinician
Research scope	Subject, e.g., health sciences; geographic scope, e.g., specific to a particular city or country
Digital K* format	Blog; Twitter; YouTube; Facebook; Discussion boards or forums; Podcasts; E-learning platforms; Websites; e-Newsletters; Plain language summaries; Research or professional reports; Resource lists; Other
Non-digital K* format	Pamphlets; Newsletters; Handouts; Plain language summaries; Research or professional reports; Press releases; Policy briefs; Lectures; Events; Other
Intended knowledge users	Professionals, e.g., nurses, employees; Policy makers; Students; Adults; Elders; Children; Young adults; Specific gender; Health consumers, e.g., patients, parents and caregivers; Other/unspecified, e.g., general public
Study duration	Length of time specified for K*/audience engagement
Accessibility	Published in an open access or paywalled journal

We also created fields to make open-ended notes about the study sample, methods, outcomes, and research goals and examined these fields qualitatively.

Findings

In this section, we present a quantitative summary of the information extracted from the articles, as described in Table 1. A significant amount (90%, n=40) of the reviewed articles were in subject areas related to health sciences, including in the fields of emergency medicine,

nursing, public health, health policy, and mental health. While there are K* efforts in the humanities, social sciences and science disciplines, they were not captured in this scoping exercise. This may be indicative of issues with our terminology; for example, science researchers may develop patents, which is not a research output we captured. However, it may also signal that fewer scholars outside of the health disciplines are practicing K* or that their practices are not being documented in their scholarly outputs, either because it is not a normative part of their scholarly discourse or is not supported by primary publishing venues. Nonetheless, this is a finding worthy of further investigation.

Less than half (45%, n=20) of the articles were published in open access (OA) journals. One OA journal, *Journal of Medical Internet Research* (*JMIR*) and its affiliated *JMIR Research Protocols*, *JMIR Mental Health*, and *JMIR Human Factors*, stood out with 13 articles. It was notable that open access publications for K* work were not largely selected.

Figure 1 depicts the articles year of publication.[5] Most of the articles were published after the year 2014, reaching a peak in 2017 (n=10). Author affiliations were gleaned from the articles and from web searches. Institutional affiliations were classified as
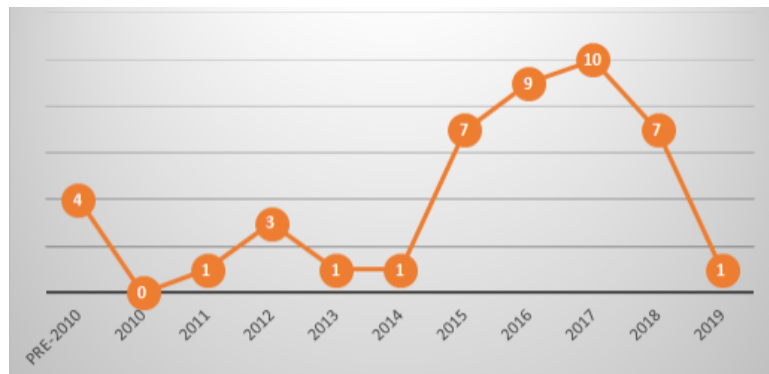
Figure 1 *Number of articles by publication year*

academic (including faculty or research institutions affiliated with a university) or professional (medical, industrial, professional, non-academic institutions). Most author groupings were affiliated with academic institutions (n=26), followed by joint collaborations between academic and non-academic authors (n=15), and purely non-academic professional authors (n=3). Authors were based in 15 countries, with Canada (n=20), the United States (n=9) and Australia (n=8) figuring most prominently. Other countries included the United Kingdom, Germany, Saudi Arabia, India, Malaysia, Norway, Sweden, Democratic Republic of Congo, Qatar, Spain, France

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[5] Note that the 2019 publications include up to April 2019.

and Croatia. These findings are not surprising given that we included only articles written in English.

Knowledge end-users

The reviewed literature focused on studying the impact of K* practices on diverse sets of end users (Figure 2). Professionals and practitioners were most targeted (n=20), followed by health consumers (n=14) (which includes patients (n=9), parents or caregivers (n=5), policy makers (n=10),
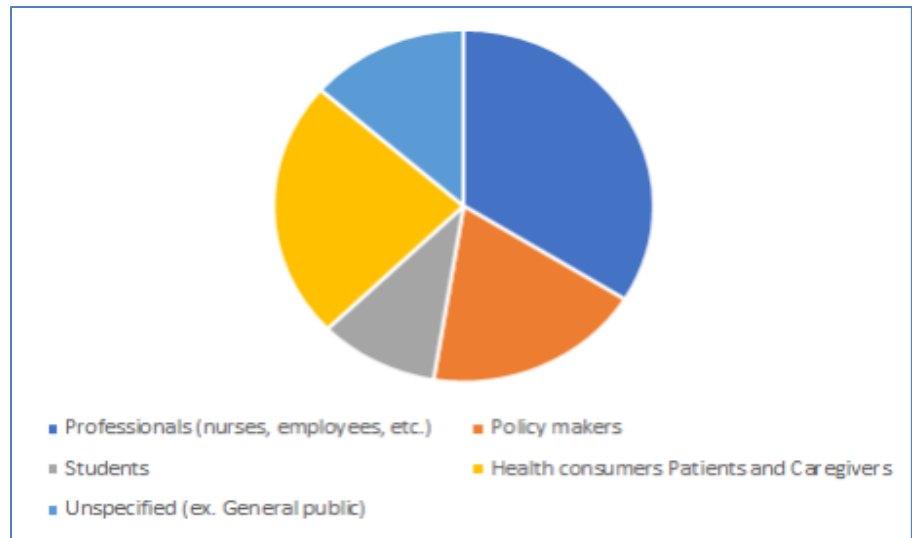

Figure 2 Research end-users

students (n=6), and groups of unspecified audiences (including the general public) (n=8). Five of the articles focused specifically on women, but the remainder did not specify gender. Among the 12 articles that specified age as an inclusion criterion for sample selection, most targeted adults (n=9), followed by children or young adults (n=2), and seniors (n=2). Of those articles mentioning duration in their analysis, the most common timeframe was 1-6 months (n=15), followed by less than one year (n=11), less than one month (n=5), and 7-12 months (n=2).

K* Modes

We grouped modes of K* identified in the articles into three categories: 1) electronic/ online, 2) print, and 3) oral communication; some articles used more than one K* mode.

Figure 3 shows digital formats (n=33); interestingly, podcasts were not used by any of the reviewed articles and are thus not included in the analysis. Facebook, Twitter, and blogs were the top three platforms, followed by YouTube and websites, online discussion forums, e-learning platforms, and electronic lay summaries. The "other" category consisted of a range of

applications including: Instagram, wikis, Slideshare, Google+, Pamphlets via emails, Live chats, Web conference, Whatsapp, Snapchat, Linkedin, and others.
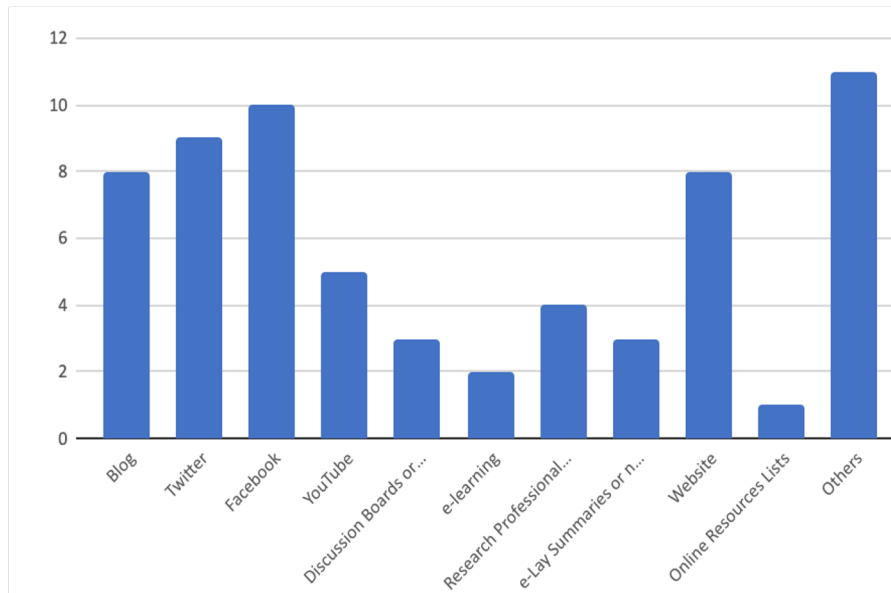
Figure 3 *Online media for K**

Print based K* instruments were commonly research reports, lay summaries (synopses of scholarly articles), and policy briefs, as well as newsletters, pamphlets, and press releases and non-academic articles (Figure 4).
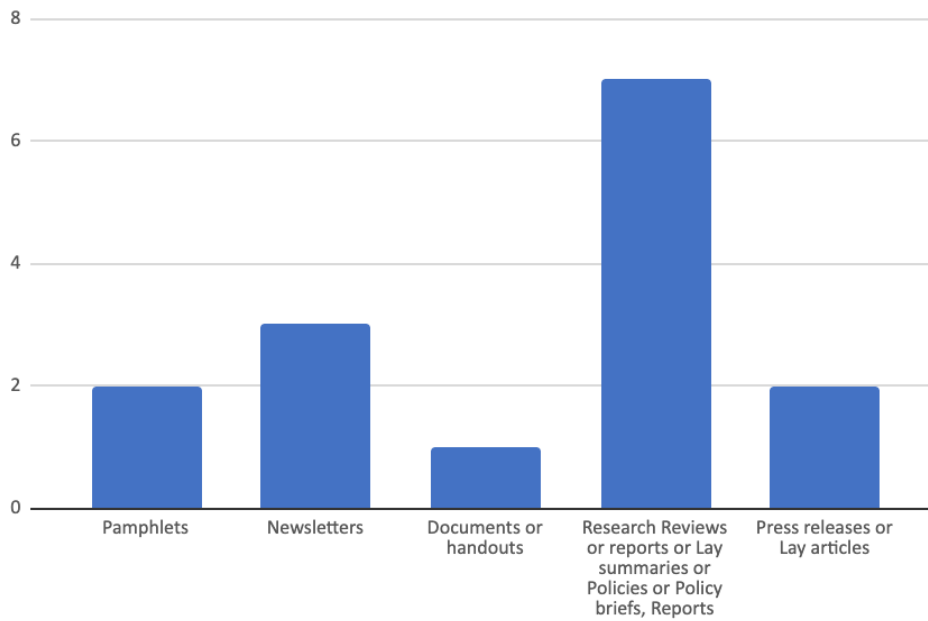
Figure 4 *Print-based formats*

Oral communication strategies were also used (n=11). The vast majority (n=6) employed workshops, a few used lectures (n=2), while others featured other interventions (n=4) such as research-based theatre, traditional radio broadcast and educational TV programs, and lectures.

Evaluation of K* Strategies

Surveys were most commonly used to capture attitudes and behaviour towards K* instruments and interventions (n=29), and the majority of these studies relied exclusively on surveys (n=22). Social media analytics was the second most widely used data collection method (n=13), with studies focusing on "traffic" and online interactions (e.g., followership, viewership, comments, likes, etc.). Some studies combined social media analytics with surveys (n=7), while others relied solely on social media analytics (n=6). Many used tests (in the form of quizzes or experiments) (n=8) to capture changes in user behaviour or knowledge level. This may have involved capturing a baseline (before participants were exposed to the K* intervention) to compare post-intervention behaviour or knowledge. Tests were used in combination with one or more data collection methods (e.g., surveys, interview) (n=7) or web analytics (n=1), or on their own (n=3).

Qualitative analysis of the reviewed articles

As part of the qualitative analysis of the data, we examined whether impact was reported in the reviewed articles. This included changes in behaviour, improved knowledge (including professional development), higher web-based interactions, uptake in industry, and policy change. As we deepen our qualitative examination of the articles, we are looking to the broad literature on knowledge utilization and exchange to develop our approach. First, Greenhalgh et al. (2004), Landry et al. (2001) and Redman et al. (2015) have emphasized the value of contextual factors in knowledge creation and use. Redman et al.'s (2015) acknowledged "enabling factors" in research engagement as external (e.g., such as the availability of research) and internal, distinguishing individual (e.g., perception of the value of research) and organizational (e.g., policies, resources to support research use) factors. Second, Greenhalgh et al. (2004) adapted criteria from the World Health Organization Health Evidence Network to evaluate the quality of the evidence identified in their case studies. They used categories ranging from "no evidence" and "limited evidence" to "strong evidence," and also differentiated "direct" and "indirect" evidence at the

strong and moderate levels (p. 586). Finally, Weiss (1979) identified seven different meanings of knowledge use (e.g., knowledge-driven problem-solving, tactical, interactive). Redman et al. (2015) also emphasized the purpose of using the research, including agenda setting, policy development and implementation. Nutley, Walter and Davies (2007) summarized different models, such as Cousins and Leithwood's (1986) proposition that research may be "used" to make decisions, educate people, or provide basic evaluation of a program.

Thus, our qualitative analysis is focusing on: 1) end-of-grant versus integrated K* work, and any "enabling factors" that influenced the design and implementation of the K* strategy; 2) the extent to which the articles were able to evaluate the "reach" or impact of their research with their targeted audiences; and 3) the purpose for mobilizing the research. We will discuss these three themes in greater depth at the INKE meeting.

Conclusion

The emphasis on how knowledge is created, disseminated and used is not new. Weiss (1979) identified seven different models of knowledge use, and other researchers have examined the linear and dynamic ways in which research moves between researchers and end-users (Landry et al., 2001). What is emerging are top-down forces (i.e., funding agencies, university strategic plans) and bottom-up directives (community-led initiatives to define research priorities and the guidelines for engagement) that are redefining the ways in which scholarship is to be undertaken and shared. The reasons for these shifts are well many, but include open access mandates for publicly funded research (Government of Canada, 2016) and backlash against the extractive research conducted in community settings (UBC Learning Exchange, 2014).

However, it remains to be seen whether the impetus to engage in K* activities is having a demonstrable effect on research outputs and outcomes, and, beyond the scope of this review, whether both new scholars or those trained in more traditional methods of academic research have capacity to shift their practices. This scoping review was an attempt to understand the current landscape of K* with respect to who is being targeted by K* strategies, what media is being used to communicate research to broader audiences, and evidence of successful research engagements. We anticipate that these findings will allow us to develop frameworks around the barriers of K* for researchers, identify the skills and knowledge needed to do K* work

effectively, and explore contextual factors of research use that must be considered in designing meaningful research engagements with end-users.

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