

Searching for settlement information on Reddit

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Abstract

Newcomers are using informal means to find settlement information that is also freely available through formal settlement service providers. Newcomers may seek settlement information on Reddit when the same information might be found through a settlement service provider. This study finds that several Reddit submissions can be categorized in at least one or more of the formal settlement service categories. There is some overlap between informal conversations on Reddit and formalized settlement services. However, informal spaces go beyond providing settlement information in formalized categories. These results suggest that there is scope for policymakers to take a closer look at online conversations to better understand the needs of newcomers when they are looking for information about settling in Canada before and after they arrive. There is the potential to use this information to identify service gaps and create new funded settlement service categories. There is also the potential to accurately train a machine learning model to classify new Reddit submissions and produce real-time advice to policymakers on newcomer information needs.

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INTRODUCTION

Migrants rely on information before and after arriving in Canada to transition to their new life as smoothly as possible (Allard, 2022; Caidi et al., 2010; Monteiro, 2022b; Shuva, 2021a, 2023b). However, information in their home countries is limited in what to expect after arriving (Allard, 2022; Monteiro, 2022a; Shuva, 2023b). In most cases, the decision to migrate involves a complex mixture of information precarity and misinformation (Wall et al., 2017). But even after arriving, they may lack knowledge about the support that is freely available to them (Government of Canada, 2023a).

Reports of disenfranchised newcomers are increasing, even while the information-gathering landscape has expanded considerably with the predominance of Internet-enabled devices and connectivity. There are competing opinions about whether the information distributed on the Internet, particularly social media, has benefitted newcomers or not (Karim, 2023).

Consider the case of pre-arrival migrants. For this group, accessible information that is verifiable and accurate is difficult to gather because they are physically distant from the information sources, which are concentrated in the destination country. Of 550 federally funded settlement service providers (Government of Canada, 2023a), only about 17 service providers have active pre-arrival settlement service agreements (as of January 2021; Government of Canada, 2021b). It is highly unlikely that pre-arrival newcomers will ever use a pre-arrival service. In 2020–21, only 16,447 clients had used a pre-arrival service (Government of Canada, 2021a). Most will rely on their friends and family (i.e., their close social networks) living in Canada, others will use settlement services, while some will rely on strangers on online platforms with whom they have few or no prior relationships.

Examining data from a study by the Association of Canadian Studies – World Education Services (2021), I found that just 7 percent of newcomers found settlement information through a social media platform, even though a large percentage of newcomers found information about immigration policies (9 percent), training (9 percent), health policies (11 percent), general news about Canada (13 percent) and employment opportunities (17 percent).

Among those who have used a settlement service from a Settlement Service Provider Organization, 22 percent learned about that service through a social media platform (Monteiro et al., 2023).

The survey findings suggest that social media is an important source of information for many things, but not as much for information about settlement services (Monteiro et al., 2023). This is either because they do not perceive it as a source for reliable and authoritative information about settlement services, or a lack of settlement information on these platforms influenced those perceptions themselves. In previous studies, trust was shown to be an important determinant of newcomer preferences over which information sources to use (Caidi et al., 2010).

Settlement service providers and government agencies are not primarily targeting newcomers on social media platforms to inform them about available services, even though an increasing number of Canadians are using these platforms as sources of information and news. About 80 percent of immigrants are social media users and have similar usage rates to native-born Canadians (Monteiro, 2022b).

According to a Maru Public Opinion survey conducted in 2022, approximately 26 percent of Canadians get their news from social media websites and 40 percent use social media “always” to get daily news (Casaletto, 2022; Maru Public Opinion, 2023).

When settlement information is not readily available, newcomers will use whatever is available. Informal virtual communities on platforms such as Reddit are accessible and may complement other information sources such as websites, co-ethnic community forums (Shuva, 2021b), public libraries and other information institutions (Caidi et al., 2010; Caidi & Allard, 2005; Shuva, 2023a). Even when the information lacks reliability and accountability, virtual communities have other advantages such as personalized information that speaks to an individual's unique experiences.

This article explores how newcomers are using informal means to find settlement information that is also freely available through formal channels. Newcomers may seek settlement information on Reddit when the same

information might be found through a settlement service provider. Specifically, this paper estimates the degree to which informal online conversational spaces are structured around formalized settlement service categories, and whether these informal spaces go beyond or fall short of those formal categories.

Note that this paper is not about how online communities form, but about how online discussions, that may or may not make up a learning community (Haythornthwaite, 2019), can replicate formal categories. This formalization of informal online discussions indicates that particular outcomes are important to newcomers, such as labor market integration, cultural integration, housing security, health, or food security. Although I cannot observe these outcomes in the data, the search for information in these categories points to outcomes that are relevant to newcomers and policymakers.

Data for this study are extracted using direct access to the Reddit API using a filter search for keywords such as “new to Canada”, “new immigrant to Canada”, “just arrived in Canada” or “received my (our) confirmation of permanent residency (COPR)” across all subreddits. I manually categorized all submissions according to 15 categories of formal settlement services. I then trained a Naive Bayes classification model using a subset of the data, which is then tested for feasibility in future applications.

The results show that 32.16% of Reddit submissions can be categorized in at least one or more of the settlement service categories. This suggests that there is some overlap between informal conversations on Reddit and formalized settlement services.

However, these informal spaces go beyond formal settlement service provision because 21.04% of submissions included a question or query that could have been dealt with by a settlement service provider but there exists no comparable formal service as far as I know.

LITERATURE REVIEW

There is a broad literature on how newcomers search for settlement information. Within the Canadian context, studies by Caidi and Allard (2005) and Caidi et al. (2010) have shown that social exclusion and, to some extent, lack of integration of newcomers into life in the host country are an information problem. These authors have emphasized social and economic factors as the primary determinants of newcomers' inability to access and use new information and communication technologies skillfully to avoid marginalization and become more socially included.

Caidi et al. (2010) has also shown that mundane information-seeking practices of immigrants in everyday life are important determinants of how they might develop preferences for certain types of information sources over others.

These preferences are developed by their social and economic position and cultural background, which are determined by the presence of potential structural and social barriers, such as lack of language proficiency, unfamiliarity with information sources in the host country, immigration status, social isolation, poor experiences when communicating with service providers, and cultural differences attached to the value and understanding of particular information sources.

In addition to the barriers, preferences over information sources are also related to the quality of their social networks (i.e., the presence of strong and weak ties that can supply useful information, which could include a sizable “digital diaspora”); the visibility of formal settlement service organizations, ethno-cultural organizations, and other information providers; the phase of their integration journey (Allard, 2022); and more importantly, the perceived level of trust in those networks and organizations.

Caidi and Allard (2005) also emphasizes how the needed settlement information is a public good when it is accessible through information institutions such as public libraries, archives, and museums. Aside from being publicly accessible, these institutions must provide resources in many languages, programming should focus on shared experiences and aspirations, and finally, these institutions must value the knowledge of newcomers that may be

situated within their cultural heritage (Caidi & Allard, 2005; Komlodi et al., 2016). As a public good, it becomes part of the social capital that newcomers rely on for their inclusion in the host country.

Considering the focus of this study is on social media as an information source, I find that existing research on how migrants and potential migrants search for settlement information on social media platforms is small but growing.

Studies have shown how social media and mobile technologies are an essential resource for new immigrants (Monteiro, 2022b; Shuva, 2021b, 2022), refugees (Borkert et al., 2018; Dekker et al., 2018), and unaccompanied refugee minors (Kutscher & Krefß, 2018) in finding job market information, finding aid and social support, mapping routes, prices for traffickers' services, finding language assistance, learning the culture of the host country, and for emotional support from family and friends.

There are fewer studies that examine how migrants use specific social media platforms when seeking information. Instead, there are several studies on how people use specific platforms like Reddit, StackOverflow and X/Twitter to search for information on health (Nobles et al., 2018), work (Sengupta & Haythornthwaite, 2020), teacher or advisor training (Nochumson, 2020; Pasquini & Eaton, 2019; Tur & Victoria, 2014), and education (Gruzd et al., 2018; Kumar & Gruzd, 2019; Sengupta & Haythornthwaite, 2020).

Most of the research papers looking at how platforms support search and learning fall under the *learning in the wild* and *searching as learning* literature. This study does not directly contribute to these two strands of literature because I am not looking at whether newcomers have learned anything from their search for information on Reddit. Instead, I assume that there is some *learning* and *searching as learning* that occurs when newcomers connect with members of the Reddit community. In this way, the theoretical frameworks of previous studies are needed to understand the underlying processes from the observable data, even though I cannot make any empirical inferences about the cognitive mode of learning of the users.

While platforms such as Wikipedia, Goodreads and OpenStreetMaps are information providers of a specific product (online encyclopedia, online book reviews and open access maps, respectively), platforms such as Quora, Reddit and Stack Overflow have no analogous product to speak of. Yet, groups on these Q&A platforms provide valuable answers with no predefined goals for their users (Sengupta & Haythornthwaite, 2020). Q&A platforms produce knowledge through interactions, where the interactions are moderated by rules and norms that arise deliberately (by the intervention of moderators), or spontaneously (by learned responses or conforming to the behaviours observed in the interactions between users).

The learning communities that form on Reddit are the result of repeated networked interactions between users that also actively contribute to emerging roles within these communities, such as "moderator" and "FAQ finder". These relationships could constitute a *learning community* or *community of practice* (Haythornthwaite, 2019).

Although this paper is interested in search behaviour, where users perform *information retrieval* (Rieh et al., 2016), the study of commitment among users is beyond the scope of this work. Commitment to sharing and engagement is a necessary condition for the formation of a learning community. For simplicity, I assume that social learning and learning communities are formed exogenously (Haythornthwaite, 2019). That is, agents are individuals who perform a range of "look-up" and "exploratory" search tasks because they are looking for information that is personalized to their needs (Rieh et al., 2016) or are creating their own learning opportunities (Ford et al., 2014), but may not be committed to the online community from which they are retrieving information.

Consistent across most previous studies, I find that even informal interactions on social media platforms mirror pre-existing formalized structures. (1) Online information-seeking replicates in-person information-seeking behaviour with some advantages (i.e., anonymity and accessibility), (2) that online information-seeking complements traditional learning, or (3) that online information-seeking informs an information gap in traditional awareness campaigns. Most studies aim to formulate recommendations for decision-makers such as policymakers, healthcare providers, or educators.

For example, Nobles et al. (2018) found that the information sought on the r/STD subreddit can be systematized into types of diseases, symptoms, and treatments, similar to the information that is searched for through

formal healthcare providers. The authors identified policy-relevant recommendations to improve targeted health communication in line with what is being searched for on the subreddit by its users, and also address awareness gaps in traditional health information provision.

Another study related to healthcare by Ossai et al. (2022) studied information-seeking behaviour on the subreddits r/BabyBumps, r/beyondthebump, r/pregnant and r/Parenting. They found parents searched for information on paediatricians across four themes: paediatrician-specific factors, office-related factors, parent/patient factors and social factors. They identified the primary concern among Redditors was whether the paediatrician was available on their insurance network, whether they were board certified, their gender and nationality, and their vaccination policies. Potentially a cause for concern is that quality metrics and online physician reviews were not topics frequently mentioned in posts. This finding has important implications for paediatric practices in providing information that meets the needs of parents and supports an informed choice of paediatrician.

Similarly, studying the usage of #Twitterstorians among educators and learners should complement traditional teaching-learning in classrooms (Kumar & Gruz, 2019), although the way collaborative learning occurs in each setting will differ.

A SEARCH MODEL FRAMEWORK

This section develops a search model where newcomers are searching for information to attain pre-defined objectives, such as “to migrate” (Wilson, 2021) or “to integrate”. The information-seeking process is costly and, in many cases, inaccessible.

Newcomers derive utility from the information they search for during their migration and integration journey which informs their actions, affect and cognition. Newcomers seek information that derive certain rewards or avoid harms, but may also derive affective value from information that reduces their overall ignorance on a topic. Similarly, newcomers have expectations and pre-defined beliefs which influence their choice of what information to look for (Kelly & Sharot, 2021; Sharot & Sunstein, 2020).

How newcomers predict information will impact their actions, affect, and cognition will jointly determine how much they will invest in information-seeking behaviours (Kelly & Sharot, 2021; Sharot & Sunstein, 2020). In some cases, they may seek out more information while others may actively avoid certain types of information (Golman et al., 2017; Kelly & Sharot, 2021; Sharot & Sunstein, 2020).

It is very likely that the value newcomers derive from information seeking is highly individualized, determined by a range of pre-disposed behavioral factors originating from their psychological state and socioeconomic condition.

Although, it is possible that newcomers may engage in information search practices that lead to worse outcomes (Golman et al., 2017). In this study, we assume that newcomers' predictions about the outcomes of information search are perfectly aligned with their expected outcomes.

The costs associated with the search for information depend on the amount of prior knowledge that the newcomer has. Newcomers are heterogeneous in the amount of prior knowledge they have about life in Canada. Therefore, the amount of learning that occurs in the search process depends on the level of that initial knowledge (Vakkari, 2016).

The individualized costs of information search may also be influenced by the social position of the newcomers in the host country. In other words, their immigration status (i.e., as permanent residents, temporary workers, or international students), the size and quality of their social networks, and their previous experience with information institutions in the home country (i.e., public libraries, archives, or museums) jointly contribute to newcomers' information search practices when they arrive in Canada (Caidi & Allard, 2005).

The environment in which newcomers operate is complex in many dimensions. In an idealized setting, newcomers have all the information they need to begin their migration and integration journey. However, perfect

information is far from the reality faced by many newcomers. Instead, the information must be searched for in an environment where the necessary information is distributed across several sources.

The distribution of information across sources is a friction that newcomers must overcome in addition to other potential barriers to migration and integration. What matters to newcomers for efficient migration and integration is their ability to search for information in an environment where access to information is unequal, but also being able to learn from those sources as they interact with the information providers (i.e., settlement service providers, government agencies, employers, friends and family, and virtual communities).

Newcomers' learning is defined as a change in their conceptual knowledge structure, or in other words, as the incorporation of a flow of knowledge into their current knowledge structure. Newcomer learning can be conceived as the result of an iterative search process (i.e., formulating queries, selecting sources to review, and reviewing those source documents) by updating the knowledge structure they have about a topic.

Even though learning is the outcome of searching, this does not rule out that during the search process learning is also happening. And, we might even predict whether learning was happening by observing the search process over time (Vakkari, 2016). We do not go into much detail on these aspects of search and learning because it is beyond the scope of this paper. Instead, it suffices to know that searching for information involves a change in the knowledge structure that leads to learning about a topic.

I assume that learning is a connective process (Haythornthwaite, 2019), and occurs in informal and non-formal ways, either through in-person interactions or virtually through a platform.

Formal exchanges between settlement service providers and their newcomer clients are one type of connective learning with a clear aim of settling and integrating those clients. Settlement service provider organizations (SSPO) are formal institutions with financial resources, trained teaching staff and a well-defined objective.

The services that are provided through an SSPO may be categorized in a list of well-defined sets of services. These categories define the boundaries of what constitutes settlement and integration. In the [Appendix](#), I have provided a list of federally funded settlement services that SSPOs in Canada might offer.

Given that the challenge for SSPOs is teaching and providing information that will support the settlement needs of newcomers, there is good reason to suggest that these formal exchanges involve connective learning.

On the other hand, learning through informal exchanges between friends, family, and even strangers is an equally important way to gather settlement information (Allard, 2022; Shuva, 2021a, 2021b). Even though informal exchanges do not include vast financial resources, pedagogical skills or even common objectives for the exchange, there is still useful information being conveyed.

The information exchanged informally can also be categorized, but the boundaries of what constitutes settlement and integration are not rigid. They are malleable to the needs of the newcomer and the quality of the exchange. For instance, newcomers might need more personalized information, or the exchange might involve co-learners (i.e., all of whom are newcomers). If the personal objectives of learners are clear, then informal exchanges also involve connective learning.

Even though the connectivity associated with learning in informal exchanges is similar to that in formalized exchanges, the information that is passed may have unique characteristics. Newcomers themselves describe SSPOs as reliable and accountable (Monteiro, 2022a). Likely, newcomers will also view the information that SSPOs provide as trustworthy. They might view information from informal exchanges with suspicion depending on the source of the information. Newcomers will be reluctant to act on such uncertainty.

This suggests that information passed through connective exchanges will have a quality dimension. The quality of information becomes even more suspect where co-learners are anonymous (i.e., they may not be field experts), and the learning is a sequence of short relations without a reputation (i.e., infrequent interactions) rather than a long relationship (i.e., consistent and frequent interactions) between users (Haythornthwaite, 2019). Learning on Reddit can be characterized as connective learning based on inquiry, advice and support, filling information gaps from formal sources, personalization to unique situations, but also as a quick inquiry to "tid-bits" of information.¹

The search process associated with informal exchanges in online networks such as Reddit may have a different relation to learning outcomes. The search mode that I observe in the Reddit posts of this study is better described as *look-up search* that involves fact-finding and inquiry rather than *exploratory search* (Rieh et al., 2016). Even though this project does not assess whether learning is happening or the type of learning that is happening on Reddit posts, there is reason to believe that the learning might be receptive and critical because co-learners are free to argue and discuss. In other words, users are not just fact-finding, but also evaluating/debating the usefulness and reliability of the information.

In this case, learning is unlikely to involve some *creative* cognitive forms (Rieh et al., 2016), which are reserved for learning behaviours that go beyond simply looking for the right answer but also involve the users reflecting on the depth of their search process.

Connectivity among information providers

It is not just the connectivity of learners that matters, but also of those that hold information. So far, I have assumed that the SSPOs hold information. In reality, settlement information is distributed between settlement service providers, other nonprofit agencies, government agencies, employers, friends and family, the diaspora, websites and virtual communities (for the rest of this section, I will refer to these as “information providers”). Migrants must exert considerable effort to navigate these formal and informal spaces to seek the information they need.

Information providers interact with each other in complex ways to provide newcomers with the information they need in the host country. The complexity of their interactions arises from seemingly disparate objectives. For instance, civil society organizations and virtual communities serve newcomers with needed information intending to support community goals. Employers provide similar information to newcomers who wish to develop more robust workplaces for newcomer employees. Some partnerships between these information providers facilitate information flows, such as through Local Immigration Partnerships (Citizenship and Immigration Canada, 2013). Immigration, Refugees and Citizenship Canada also provides information and directly responds to queries through its official Twitter/X handles (Gintova, 2019).

The formalized information providers, which include civil society organizations, government agencies, employers and diaspora associations, are more structured, potentially organized through partnerships, and produce more accountable information, but are also more rigid and less personalized in the information they supply.

Informal providers such as virtual communities are less structured, loosely organized based on moderation or codes of conduct, are more likely to reproduce misinformation, but are also more responsive to queries and environmental shifts (for instance, during the COVID-19 pandemic virtual communities were an important source of information for newcomers while formal providers transitioned to online services). However, it should be noted that informal learning spaces, such as the #Twitterstorians on Twitter (Kumar & Gruzd, 2019), may extend existing formal learning conducted in traditional settings such as classrooms. So, it may not be the case that informal learning spaces are less accountable sources of information.

Pre-arrival newcomers are physically disconnected from many of these providers and instead rely on what is accessible. In particular, pre-arrival newcomers use their personal social networks alongside websites and virtual communities to get the information they need (Shuva, 2021b). A factor to consider when using these informal sources of information is whether they are reliable and authoritative. This means that the information may be uncertain (i.e., the information provider is not an expert), factually incorrect (i.e., misinformation), or deliberately misleading (i.e., disinformation or “information crafting”) (Caplin & Leahy, 2004; Shuva, 2021b).

With websites run by formal information providers, such as government, diaspora associations, and civil society organizations, there is likely to be no question of their authoritativeness or reliability. Similarly, personal social networks, such as friends and family, are reliable but are not likely to be authoritative sources of

information. Virtual communities, such as Reddit, are the least likely to be authoritative or reliable. However, in information-precarious settings, this might be just enough to begin their journey (Dekker et al., 2018; Wall et al., 2017; Yuksel, 2022).

There are some grey areas in terms of the authority and reliability of particular online discussion forums run by private agencies that also offer paid immigration solutions. For instance, the two major online discussion forums in Canada are the CanadaVisa.com and ImmiGroup.com/forum/, both of which are run by private sector organizations offering paid immigration solutions to potential newcomers. This is a grey area because even though these forums are moderated for misinformation they could put migrants in a position where they are encouraged to pay for services.

An open question for further research is how connectivity among information providers affects the learning environment or the potential to learn among newcomers.

DATA

In this paper, I consider newcomers seeking information on Reddit communities, which is an emerging information source (Caidi et al., 2010) for settlement information. Newcomers can find information by reading posts created by other users, but they can also post their own questions. This paper focuses on the latter.

While Reddit may not be the most widely used by newcomers to search for information compared to online discussion forums dedicated to immigration topics (such as CanadaVisa.com and ImmiGroup.com/forum/), there are reasons for why newcomers may prefer to use Reddit to complement their other information sources.

First, online discussion forums dedicated to immigration issues are not easy to find, while Reddit is considered the front page of the internet and frequently appears among the top search results in Google.

Second, newcomers might prefer to use Reddit because it may not be clear to them that their particular information need is a settlement need. In this case, it would be strategic to post on a subreddit where anybody knowledgeable about the topic can provide assistance. For example, inquiries about finances and banking are probably better handled by a member of the r/PersonalFinance subreddit, who may be a finance or banking expert, irrespective of whether they are migrants themselves.

Subreddits are structured around specific topics, such as r/ImmigrationCanada, r/PersonalFinance and r/TorontoRealEstate. Within each subreddit, users ask questions or create submissions that other users comment on. The comments within each submission could range from directly answering the questions, providing additional information, to something completely off-topic.

Specifically, with submissions created by newcomers, comments can come from other newcomers, established immigrants, native-born Canadians, immigration lawyers, immigration consultants, real estate agents, settlement service provider staff, or others.

While subreddits may seem informal, there is considerable moderation by the community moderators of the content posted by its members. However, moderators do not verify information, question its reliability, or the intentions and knowledge of members who post in the community. So we should still regard the authoritativeness and reliability of the posts with suspicion.

Moderation ensures that submissions are on topic, broadly related to the subreddit purpose, and posts are not derogatory, discriminatory, abusive, or engage in self-promotion (i.e., commercialization). This form of moderation ensures that data extracted from the subreddit is useful for our analysis. Moderation is enforced by banning users and removal of posts that violate the subreddit code of conduct.

In addition to moderation and codes of conduct, there are no other formalized practices on the subreddit. There appears to be a Community of Practice that has emerged in these subreddits (Haythornthwaite, 2019). I refer to these spaces as being "co-created" by its members as a "learning community" through relations maintained over time between members that have a common purpose of exchanging information (Haythornthwaite, 2019).

Although a Community of Practice can emerge through interactions between users, these are not isolated from external influences. For instance, *r/ImmigrationCanada* submissions are self-tagged by members with one of the following flairs: “Meta”, “Express Entry (EE)”, “Study Permit”, “Citizenship”, “Work Permit”, “Visitor Visa”, “Provincial Nominee Program (PNP)”, “Sponsorship”, “Other”, “None” and others are left untagged. This organizes the subreddit into distinct conversation spaces that allow members to find relevant information quickly.

Members co-created these informal spaces as a reflection of the formal categories that were created through the administration of immigration policies. It can be expected that any information-seeking and learning that occurs in these informal spaces is occurring within these formal categories, explicitly (such as the flairs used on *r/ImmigrationCanada*) or implicitly.

The informal conversation on other subreddits may be constructed around formal categories that are less obvious and are unlikely to include submission flairs that are immigration-related. For instance, the submission flairs on *r/PersonalFinance* include “Housing”, “Debt”, “Auto”, “Insurance” and “Employment”, which matter for newcomers but also the general population. Instead, the formal categories that matter to newcomers must be identified from the content of the submission itself.

I used the following 14 formal category labels: “Employment-related services”, “Starting a business and entrepreneurial skills”, “Networking events, connections”, “Primary care services, food programs, mental health services”, “Community connections events and workshops, mentoring”, “Information sessions in banking, finances, tax preparation or housing”, “Citizenship test preparation”, “Language training and assessment”, “Needs assessment and referrals, information and orientation, pre-arrival services”, “Resettlement assistance program”, “Temporary residency status”, “Other (miscellaneous)” and “Other (immigration-related)”. The final label “Not relevant” was included to categorize posts that were not included in any of the other labels.

I excluded “In-direct services” from the list of service categories because these services are not provided directly to newcomers and it is unlikely that they would arise in an informal discussion. I also excluded “Support services” because these services are typically provided in addition to another settlement service.

I also combined service categories based on similarities: “Needs assessment and referrals” was combined with “Information and orientation” and “Pre-arrival services”. Similarly, “Language assessment” was combined with “Language training”. Then, “Credential and skills assessment” was combined with “employment-related services”. Finally, “Community connections events and workshops” was combined with “Mentoring”.

Numerous submissions, comments and replies on Reddit were obtained using the Reddit API. I extracted Reddit posts that included the following exact terms “new to Canada”, “just arrived in Canada”, “just migrated to Canada”, “just immigrated to Canada”, “newcomer to Canada”, “newcomers to Canada”, “newcomer in Canada”, “new immigrant in Canada”, “new migrant in Canada” or “received my (our) confirmation of permanent residency (COPR)”.

I restricted this study to 1451 submissions. I excluded comments and replies because the focus of this study is *search* rather than *learning*. However, the gap between search and learning is narrowing with advancements in virtual search technologies (Marchionini, 2019). Searchers use queries for information retrieval and evaluate the search results based on prior knowledge, making sense of those search results and re-evaluating their search strategies. Since search has become, and is further becoming, less expensive in time and effort, searching, learning and making sense of the search process is instantaneous.

Some posts were not relevant to this study and were excluded. Posts that do not mention Canada in the text, title or the name of the subreddit were excluded.

Posts that received no comments were included, but we could easily conclude that there was no connective learning happening within those threads. Also, posts from users living in Quebec or posts that mentioned Quebec were also included. However, posts in French were excluded because only English keywords were used to search for posts through the Reddit API.

The following section will discuss the methodology that I used to label submissions based on the content of the title and text of the submission.

METHODOLOGY

I manually coded the 1451 submissions into one of the 14 category labels. I read the title and text for each of the submissions and assigned two labels to each of the submissions. The first label that was assigned more closely matches the content of the submission than the second. About 99 percent of submissions had the same first and second labels assigned to them. For the rest of this study, I will only use the first label.

The service categories that were assigned to each of the posts were based on methods used by prior studies such as Kumar and Gruzd (2019), Ossai et al. (2022), and Sengupta and Haythornthwaite (2020). The difference with those studies is that an existing framework of service categories already exists.

The categorization was completed twice by the author to ensure that the categories were correctly assigned.

During coding, I encountered several submissions from SSPOs and private entities that were promoting their own services. I found 21 submissions by an SSPO and 90 by a private entity. I excluded these submissions leaving 1340 submissions that were used in this study.

For submissions that were assigned an “Other (miscellaneous)” label, I also added a descriptive label with no predefined set of categories. I let the labels within this category emerge naturally from the content of the submissions.

Before reading the submission content and assigning labels, I learned about the services that were being provided by settlement service providers. A summarized description of the services is provided in the [Appendix](#).

The pre-defined service categories come from a variety of sources such as definitions used by IRCC in the Settlement and Resettlement Program (Government of Canada, 2023b). I also used more detailed descriptions of the services from Praznik and Shields (2018).

Federally funded settlement services are only available to those who have received their Confirmation of Permanent Residency (COPR) before arriving in Canada or with Permanent Residency status after arriving in Canada. Since the migration status of a Redditor is not explicitly identifiable, I inferred it from the content of the submission. I assigned service labels to submissions that clearly indicated permanent immigration, while I labelled others as “Temporary residency status” or “Not relevant”.

Note that some temporary residents might be eligible for settlement services from agencies that receive funding from other sources, such as provincial/municipal governments, private donations, and grants. Since the COVID-19 pandemic and also since an increasing number of immigrants are choosing to get their permanent residency through a two-step immigration pathway, there have been growing demands to extend federally-funded settlement services to temporary workers and international students.

The search terms that were used to collect data, such as “new to Canada”, “just arrived in Canada” could be used by temporary residents (i.e., international students and temporary foreign workers). Where there is uncertainty about the status of the user, I default to the assumption that they have received their confirmation of permanent residency or already had permanent residency status.

The labeling process involved reading the title and text of each submission and assigning them to the correct label based on the query or question that the Redditor is asking in their post. The correct label was decided by asking whether a settlement service could have addressed the question.

I have provided a few examples of submissions alongside the label that was assigned in [Table 1](#). There is some uncertainty in the process of assigning labels because settlement services involve a long time commitment to attend programs and workshops which could last hours to days. The queries that are submitted by Redditors are usually tid-bits of information that are part of a service and do not represent the full extent of a service provided.

Sometimes it was difficult to determine whether I should include a submission that did not have an obvious service category as “Other (miscellaneous)” or “Not relevant”. I reserved the “Other (miscellaneous)” label for submissions where the Redditor explicitly included a question or query but could not be assigned to any of the other service categories. The “Not relevant” label was used for submissions where the Redditor did not include a question or query, but was advising, providing an update on their situation, or describing an experience they had.

TABLE 1 Examples of submissions and labels.

Link	Label
1	Orientation and information
2	Primary care services
3	Tax preparation

Finally, I trained Naïve Bayes and Support Vector Machine models with the manually labelled submissions. About 80 percent of submissions were used to train the model, and the remaining 20 percent were used to test the predictions of the model.

The following section will show the results of the labeling exercise and the precision of the trained models. Finally, I will also discuss the findings.

RESULTS

The first submission of the data used in this study was made on 30 April 2011, and the latest on 22 August 2023. There was a spike in submissions in 2019. Because of the COVID-19 pandemic, there is a decline in 2020, followed by many posts between 2021 and 2023 (see [Figure 1](#)).

Most submissions were from the subreddits *r/ImmigrationCanada*, *r/PersonalFinanceCanada* and *r/askTO* (see [Figure 2](#)). I expected this considering that *r/ImmigrationCanada* is focused on Canadian immigration issues and is an important source of information for newcomers.

Second, newcomers are concerned about their financial situation and may have questions about how to support themselves during their initial years in Canada. Third, since most newcomers to Canada settle in Toronto, it is not surprising that many are using *r/askTO*.

Although these subreddits had the largest number of submissions, they received few comments. None of the subreddits that newcomers were posting frequently in were among the top 20 in terms of average number of comments (see [Figure 3](#)). Although this study does not analyze the comments and replies to the submissions, this preliminary evidence suggests that newcomers' submissions may not be reaching a large audience and probably do not always find the information they need.

Many users make identical posts on subreddits to increase the reach of the post and gather more comments from different audiences. I identified 20 submissions that were identically reposted in more than one subreddit, where 3 submissions were posted on the same subreddit and 17 were posted on different subreddits. This type of posting behaviour suggests that users are searching for information that is essential to them and are strategic in how they gather information. They are maximizing the potential of landing on the right answers by posting extensively across different subreddits, rather than posting intensively on the same subreddit.

Based on the labeling exercise, I found that 431 (32.16 percent) submissions were categorized in at least one or more of the settlement service categories (i.e., not the "Other (immigration-related)", "Other (miscellaneous)", "Temporary residency status" or "Not relevant" categories). [Figure 4](#) shows a breakdown of the total number of submissions by service category.

The results suggest that there is some overlap between informal discussions on Reddit and formalized settlement services, but it is not substantial. Less than half of the submissions that were analyzed fell within one of the formal settlement service categories. This suggests that informal spaces do replicate the formal settlement service categories to some extent but also go beyond such formal categorizations.

Of the 1340 submissions, I found that the topics go beyond formal settlement service categories because 21.04 percent of submissions were in the "Other (miscellaneous)" category.

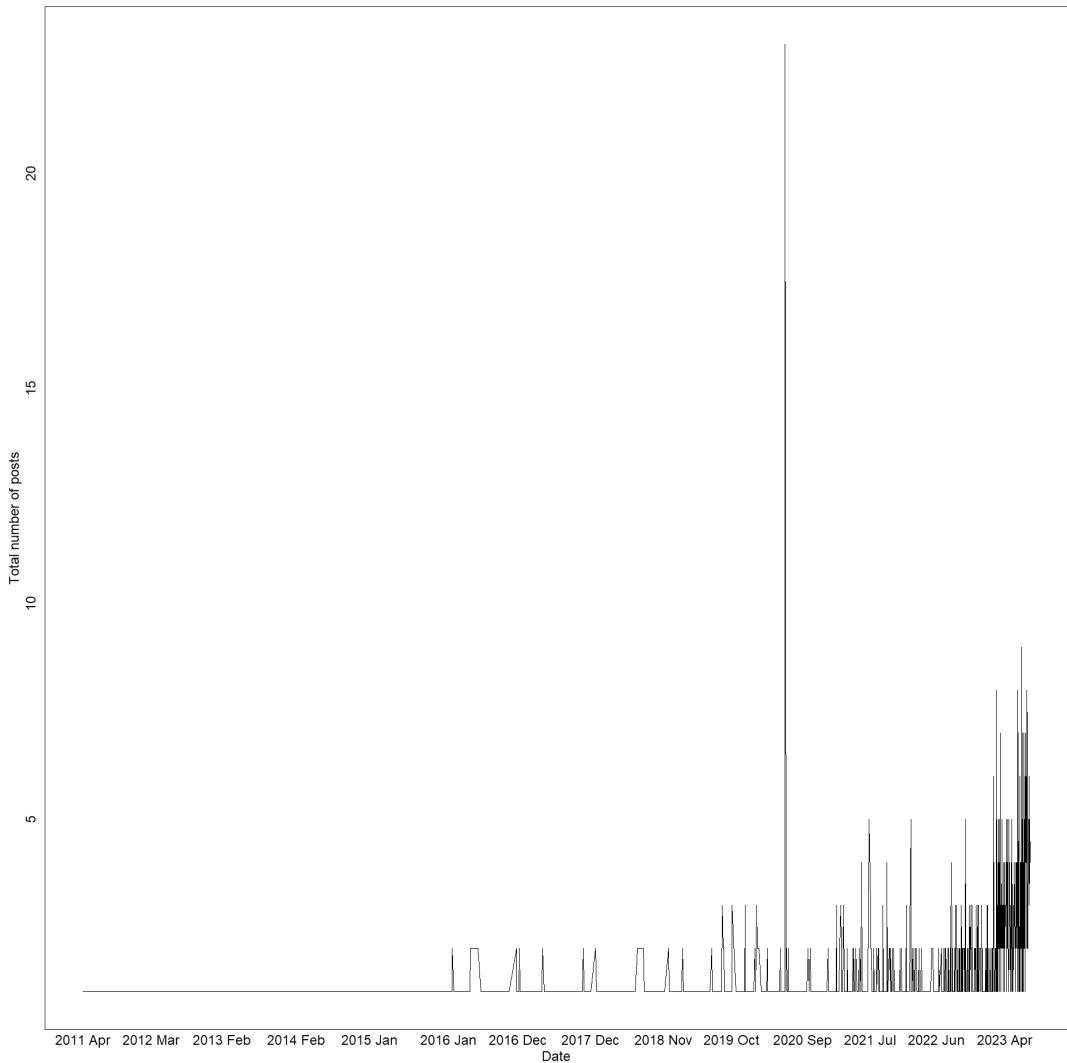


FIGURE 1 Number of submissions overtime.

Figure 5 shows the labels assigned to submissions within “Other (miscellaneous)”. As far as the definitions of service categories described in the Appendix, the labels listed in the figure did not fall into any one of the service categories. Several submissions were leisure or entertainment posts, followed by submissions related to education and student loans.

Settlement.org is a website that newcomers to Ontario can use to find services. Many of the services listed on the website may not receive federal settlement service funding but may receive funding from provincial sources and private donations. For example, Housing Assistance and Legal Clinics are offered to newcomers. In this case, the labels for “housing” and “legal” that are included in “Other” may still be considered as a part of searching within a formal settlement service category even if it is not considered a federally funded settlement service.

Similarly, “Childcare” and “Public transportation” services are sometimes provided to clients as a “Support service” on top of an existing settlement service.

Similar to crowdsourced health information, where referrals to formal health services is high (Nobles et al., 2018), I identified some promotional posts by the settlement agency Immigrant Networks, Immigrant

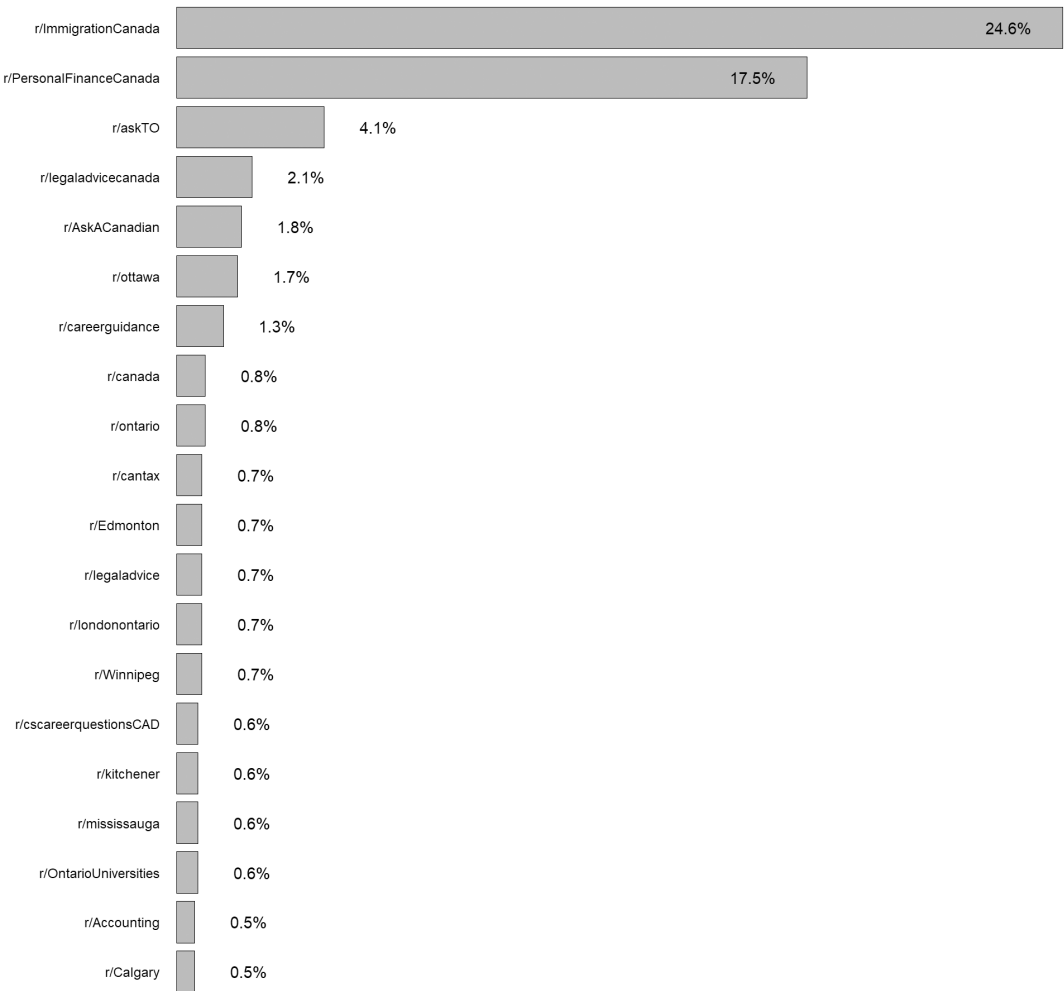


FIGURE 2 Total number of posts by subreddit. Excluding posts labelled as “Not relevant”.

Women in Business and the news website Canada Immigration News. However, I found that 90 posts (6.72 percent of all submissions) were made by several immigration consultants, an English proficiency testing agency, an apartment rental platform, a used car dealership, a realtor, a couple of online job boards, and a staffing agency promoting their own services to newcomers.

The relatively large number of private sector service providers and the almost non-existent presence of federally funded settlement service providers puts these newcomers and potential migrants in a precarious position of exploitation. It further contributes to the perception that social media is not the place for newcomers to go if they want to find settlement information.

Finally, I trained a Naïve Bayes and Support Vector Machine model using 80% of the labelled data and tested the model on the remaining 20%.

Given the limited training data available and a large number of features (i.e., the 12 service categories including the “Other”, “Other (miscellaneous)”, and “Not relevant” categories), the accuracy would be low when trying to make predictions on all these categories. Therefore, I limited this exercise to two sets of predictions for the two largest service categories of “employment-related” and “Information sessions in banking, finances, tax preparation or housing”.

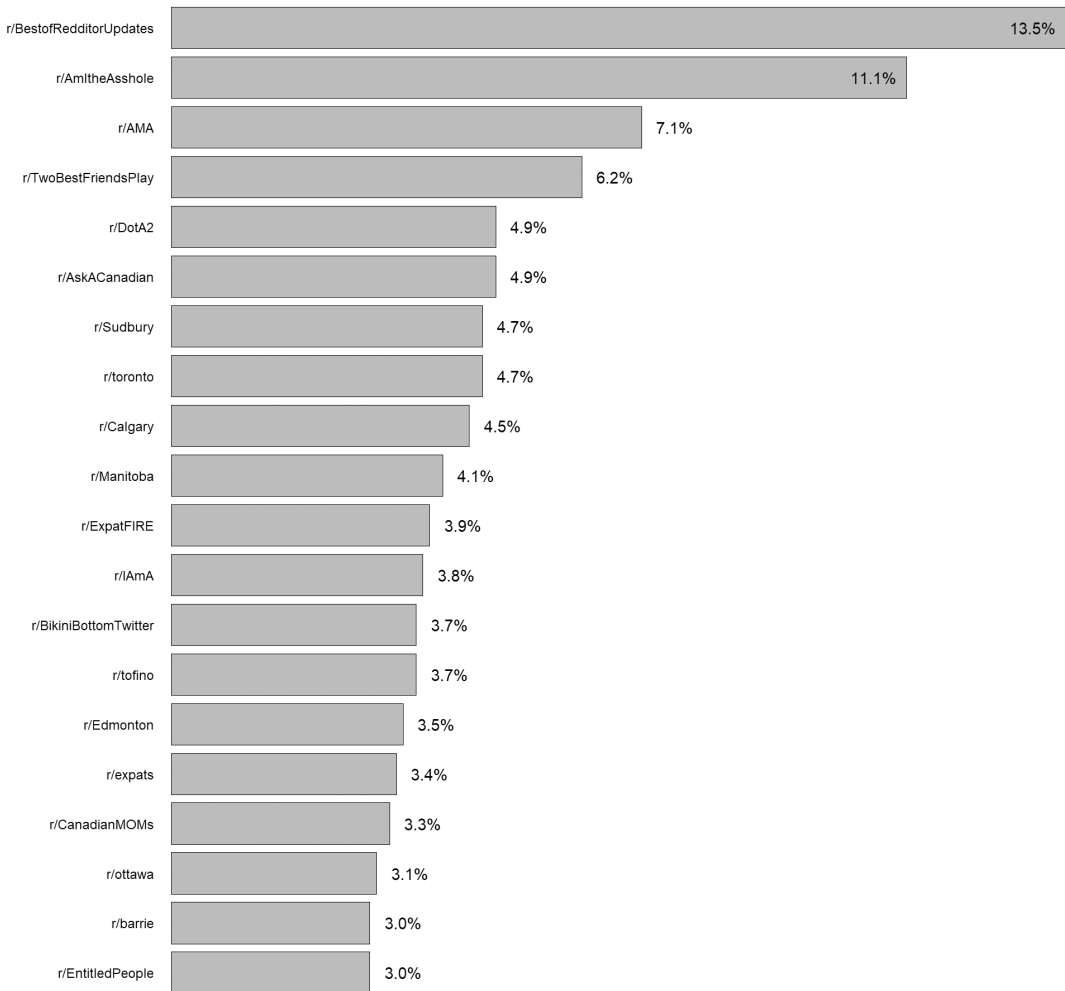


FIGURE 3 Average number of comments by subreddit. Excluding posts labelled as “Not relevant”.

I found that the accuracy of the Naïve Bayes model was very low (accuracy rate of just 1%) in predicting each of the two services. The accuracy of the Support Vector Machine model was 96% in predicting “employment-related” services and 90% in predicting “Information sessions in banking, finances, tax preparation or housing” services.

This preliminary exercise indicates that there is potential to produce a more accurately trained machine learning model to classify new Reddit submissions and to provide real-time advice to policymakers on newcomer information needs. However, much more training data and testing would be required to accomplish this task and build a functional model.

DISCUSSION

The main finding of this paper is that several inquiries made in Reddit posts overlap existing services provided by settlement service provider organizations, or information that could have been provided through a formal settlement service.

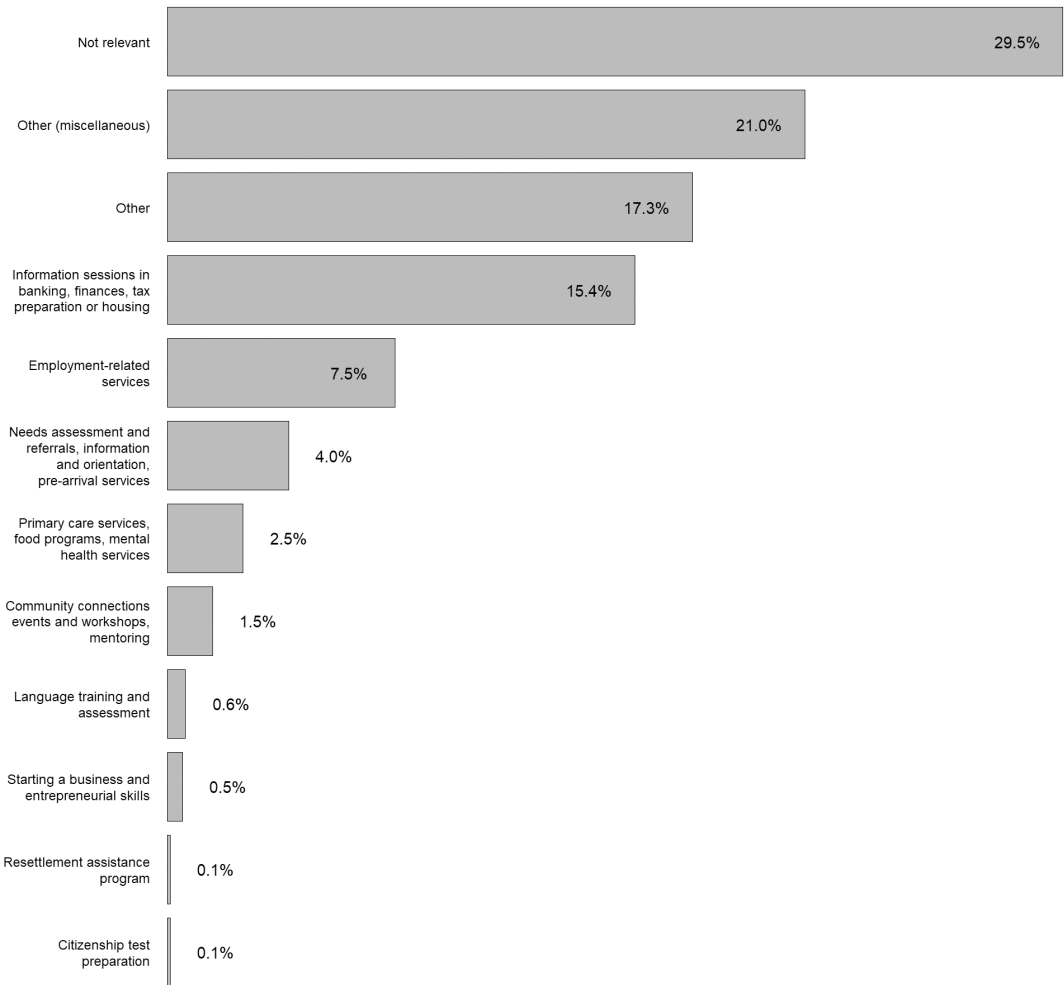


FIGURE 4 Total number of submissions by service category.

This finding suggests that newcomers are using social media to search for information either because they are unaware of the service that is being provided by formal settlement service organizations, or even if they were aware of these services newcomers might prefer to use social media platforms like Reddit to find settlement information.

This finding highlights the boundaries of formal settlement service provision, which are limited to impersonal interactions and a closed list of the 10 settlement service categories (see [Appendix](#)). Newcomers need personalized information that addresses their unique settlement trajectories and seeking such personalized information is potentially more effective when a network of weak ties is approached, such as in online communities like Reddit.

The data shows that newcomers approach specialized networks on Reddit where more specific information can be obtained to address their needs. The source of this information may not be other immigrants, but anyone who is knowledgeable about the topic. For example, newcomers were not just using r/ImmigrationCanada, but also r/PersonalFinanceCanada, r/askTO, and r/legaladvicecanada when they believed that the information they were looking for could be better addressed by those communities.

This study further highlights the mundane and everyday search needs of newcomers (Caidi et al., 2010), which is an essential part of the integration journey of newcomers. For example, leisure activities, buying & selling items,

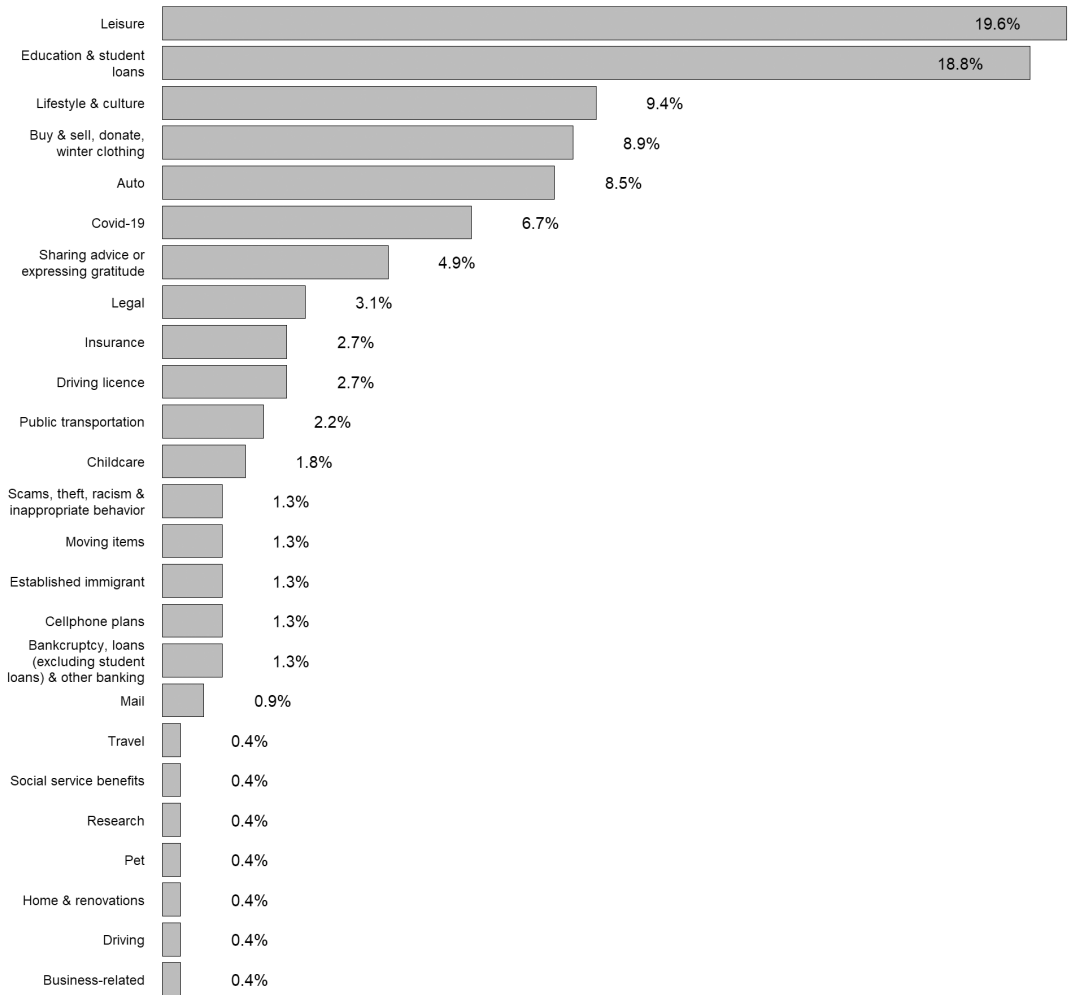


FIGURE 5 Total number of submissions by service category within “Other (miscellaneous)”.

winter clothing essentials, and public transportation were topics that appeared among the top 10 search queries in the “Other” category.

The findings of this paper also suggest that the settlement information space has many dimensions when it comes to accessing needed information. The same information may be attained in many ways.

Settlement information may not be evenly or uniquely distributed between information providers. There will be considerable overlap because newcomers themselves are diverse in their information-seeking practices. In other words, newcomers have preferences on how information is accessed based on their personal, social and historical experiences with information sources (Caidi et al., 2010).

The dichotomy that was presented in the theoretical framework of this paper suggests that formal and informal settlement information providers interplay to supply varying degrees of “trust” and “cultural affinity” to the information that is provided (Allard, 2022; Caidi et al., 2010; Monteiro, 2022a).

For example, the teacher-learner type exchanges that are a feature of formal settlement service provision are potentially high in the trust factor but may not provide information that meets the needs of diverse cultures.

On the other hand, crowdsourcing-type exchanges that are a feature of Reddit are potentially low in the trust factor but may provide information in a way that is relevant to the diverse cultural, social, and economic backgrounds of newcomers.

CONCLUSION

This article explores how newcomers are using informal means to find settlement information that is also freely available through formal settlement service providers. Newcomers may seek settlement information on Reddit when the same information might be found through a settlement service provider.

This paper finds that 32.16 percent of Reddit submissions can be categorized in at least one or more settlement service categories. There is some overlap between informal conversations on Reddit and formalized settlement services. This suggests that more than a quarter of inquiries by newcomers on Reddit are about settlement services that are already formally provided by a settlement service organization. These newcomers were potentially unaware of the services that are formally provided by settlement service organizations.

But these informal spaces go beyond formal settlement service provision because 21.04 percent of submissions were labelled as “Other (miscellaneous)”. This label was assigned to submissions that included a question or query that could have been dealt with by a settlement service provider when there existed no comparable formal service available.

These results suggest that there is scope for IRCC (Immigration, Refugees and Citizenship Canada), provincial governments, settlement service providers, and other nonprofit organizations that support newcomers to take a closer look at online conversations to better understand the needs of newcomers when they are looking for information on settling in Canada before and after they arrive. There is the potential to use this information to identify service gaps, create new funded settlement service categories, and target communications so that online newcomers are aware of formal settlement services.

There is also the potential for SSPOs to actively participate in online communities and for funding agencies to develop new funding instruments that go beyond providing services in formal delivery formats, but also in informal settings.

This research also suggests that crowd-sourced knowledge networks could serve as a tool to provide information that is situated in newcomers' cultural heritage (Komlodi et al., 2016). Information providers may benefit from supplying information that meets newcomers' demand for greater “trust” and “cultural affinity” in information sources (Allard, 2022; Caidi et al., 2010; Monteiro, 2022a).

Finally, I trained a Naïve Bayes and Vector Support Machine model using 80% of the labelled data and tested the model on the remaining 20%. The Naïve Bayes model produced a low accuracy rate in predicting “employment-related” services and “Information sessions in banking, finances, tax preparation or housing”. While the Support Vector Machine model had a much higher accuracy rate.

There is potential to produce a more accurately trained machine learning model to classify new Reddit submissions and to provide real-time advice to policymakers on newcomer information needs.

AUTHOR CONTRIBUTIONS

The author is the sole author of this study.

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CONFLICT OF INTEREST STATEMENT

The author declares that he has no conflict of interest.

PEER REVIEW

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/imig.13261>.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTE

¹ I do not go into more detail whether Reddit would make up a learning community or community of practice, since it is dealt with more concretely elsewhere (see: Haythornthwaite, 2019; Marchionini, 2019).

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APPENDIX

Description of settlement services

1. Employment-related services: Assist newcomers gain knowledge and skills to enter the Canadian labour market. Services could include training and bridging programs, employment and credential assessment, work and volunteer placements, professional networking, mentoring, career pathways explorations, as well as assistance with resume writing, job search strategies, interview preparation, understanding Canadian workplace culture, and skills assessment and development.
2. Starting a business and entrepreneurial skills: Services could include business ideation, choosing the right business structure, legal and accounting, creating a business plan, marketing/branding for your business, human resources for small businesses, best practices for pitching, market validation, sales, online networking, one-on-one mentoring, and leadership training.
3. Networking events, connections, mentoring: The programs could help clients set up their LinkedIn profiles, connect with employers, get started with online networking, connect with other newcomers, make connections within the community and find mentors to help them in their settlement journey.
4. Primary care services, food programs, mental health services: health services can include primary care, health education, disease prevention and illness, mental health supports, healthy eating, dental care, sexual health, etc.
5. Community connections events and workshops: Assist newcomers connect with people, institutions, employers and organizations in their community through activities such as conversation circles, settlement supports in schools and libraries, mentoring, and cultural awareness and knowledge transfer activities and networking activities. Host matching programs match newcomers with volunteer Canadians to support learning about life in Canada.
6. Information sessions in banking, finances, tax preparation, or housing: Supports finding temporary and permanent housing, subsidized multicultural housing, information and orientation on general banking, mortgages, savings, and tax preparation.
7. Citizenship test preparation: citizenship test, preparation.
8. Language training and assessment: Formal and informal language training in the form of classroom instruction, conversation groups, one-on-one lessons or online.
9. Needs assessment and referrals, information and orientation, pre-arrival services: Services that identify and assess newcomer needs, make referrals to other services, develop personalized settlement plans, provide information about their rights and obligations, port of entry services, counselling, pre-arrival services in person or remotely.
10. Resettlement assistance program: Provided to Government Assisted Refugees (GARS). They will receive income support for up to 12 months after arriving. They also qualify for reception at the port of entry, temporary housing, orientation and information, support finding permanent housing, applying for government benefits and programs, and assessment and referrals up to 4–6 weeks after arrival. Ukrainian temporary residents and their dependents also receive transportation, security arrangements and incidental support associated with their stay in Government of Canada-supported temporary accommodations.