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The changing landscape of academic search: evidence from a worldwide survey

Núria Bautista-Puig[1,3], Enrique Orduña-Malea[2], Eva Méndez[3], Carmen Perez-Esparrells[4], Rodrigo Costas[5]

[1]Institute of Philosophy, Spanish National Research Council (CSIC), Spain, [2]Department of Audiovisual Communication, Documentation and History of Art, Universitat Politècnica de València, Spain, [3]Department of Library and Information Science, OpenScienceLab, Universidad Carlos III de Madrid, Spain, [4]Department of Economics and Public Finance, Autonomous University of Madrid, Spain; Research Institute for Higher Education and Science (INAECU), UC3M-UAM, Spain, [5]Centre for Science and Technology Studies (CWTS), Leiden University, The Netherlands; DSI-NRF Centre of Excellence in Scientometrics and Science, Technology and Innovation Policy, Stellenbosch University, South Africa.

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Abstract

This study examines how researchers' academic search practices are evolving in a rapidly changing scholarly discovery ecosystem. Using data from a worldwide survey (n=3,349), we analyze time spent searching for academic information, purposes of search, perceived changes since 2020 and factors driving these changes. Results show that most respondents spend between one and five hours per week on scholarly search, primarily to stay up to date and conduct literature reviews. By contrast, career stage emerges as the main source of variation, with early-career researchers reporting higher time investment and stronger increases in search activity since 2020. The majority report some change in their search habits since 2020, with technological drivers (particularly the increased use of AI tools and new search tools) being the most frequently cited influences. Overall, scholarly search appears to be evolving gradually, with career stage emerging as the key dimension shaping differences in intensity.

Keywords: *scholarly search, search habits, academic search engines*

1. Introduction

The rapid growth of the scientific literature has made the discovery of relevant information an increasingly challenge for researchers. As the volume of scholarly publications continues to expand, scholars rely heavily on digital infrastructures to identify, filter, and access relevant knowledge. In this context, the academic information seeking ecosystem, ranging from

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academic search engines, bibliographic databases, and other web-based platforms, has become a key infrastructure of how researchers locate and engage with scientific information (Gusenbauer and Haddaway, 2020; Ortega, 2014).

Over the past decades, academic search engines have consolidated their role as central entry points to the scholarly record, shaping not only access to information but also the visibility and circulation of scientific knowledge (Haines et al., 2010). Their coverage, indexing practices, and ranking algorithms influence which publications are discovered and consulted by researchers (Lawrence and Giles, 1999; Gusenbauer and Haddaway, 2021). The emergence of AI-based tools has introduced new possibilities for interacting with scholarly information and navigating large volumes of scientific literature (Liu, 2026). These developments raise important questions about whether researchers' search habits are beginning to change and how these transformations may be reflected in everyday scholarly search practices.

Despite the growing body of research on scholarly information-seeking behavior and the increasing role of academic search engines in literature discovery, existing evidence on researchers' search habits remains limited and fragmented. Previous studies have often focused on the use or perceived usefulness of specific search tools within particular disciplines or institutional contexts, which restricts the generalizability of their findings (Hemminger et al., 2007). Moreover, much of this research was conducted before the recent expansion of AI-based discovery tools and may no longer reflect current search environments.

This study examines whether researchers' scholarly information search habits are changing within the current scholarly search ecosystem, characterized by the rapid growth of scientific literature, the consolidation of academic search engines, particularly Google Scholar (Nicholas et al., 2017). More recently, the emergence of AI-discovery tools have raised new questions about how these technologies may reshape researchers' information-seeking practices (van Noorden and Perkel, 2023). Specifically, the study aims to analyze the extent to which researchers perceive changes in their search practices since 2020, how the time devoted to search activities has evolved, and which factors are identified as drivers of these changes.

2. Methods

2.1. Survey design

This study analyzes data from a large-scale survey examining researchers' online academic search practices. The original questionnaire consisted of 29 questions organized into three sections covering search habits, search tools, and academic search engines, in addition to a set of sociodemographic questions. This paper focuses on five questions from the section on general search habits. These questions focus on the temporal dynamics of search practices, including the time researchers dedicate to searching for academic information, perceived changes in

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search habits since 2020, and factors influencing these changes, specifically gender, field of research, and career stage. In this last case, the Euraxess' classification was followed (https://euraxess.ec.europa.eu/career-development/researchers).

The survey was available in English and Spanish and was pretested with 50 researchers. Ethical approval was granted by the Ethics Committee of the Universitat Politècnica de València (Ref. P01_26-03-2025).

2.2. Data collection and analysis

The survey was conducted between May and July 2025 using the Alchemer online platform. Distribution combined targeted invitations based on ORCID–OpenAlex researcher records from the in-house database of the Centre for Science and Technology Studies (CWTS), with dissemination through academic mailing lists and social media.

A total of 5,994 individual researchers responded the survey. After excluding incomplete responses, the final dataset includes 3,349 valid responses from researchers across disciplines and career stages. The dataset was cleaned and standardized prior to analysis. All analyses were conducted in R (version 4.4.1).

3. Results

3.1. Time dedicated for academic search

The analysis of the distribution of weekly time devoted to searching for scientific information reveals clear patterns associated primarily with researchers' career stage, while gender differences appear more limited and context-dependent (Figure 1).

Across all time intervals, researchers at the R3 (independent) stage consistently represent the largest share of respondents. This group accounts for the highest proportions in almost every category of weekly dedication, including both moderate and high levels of activity. For instance, R3 researchers constitute around 40% of those dedicating 1–5 hours per week and remain the most represented group in the 5–10h, 10–20h, and >20h intervals. This pattern suggests that the independent stage of the research career corresponds to the period of greatest engagement in systematic information seeking. By contrast, R1 (first stage) and R2 (postdoctoral) researchers display more balanced distributions across time intervals, with shares generally ranging between approximately 20% and 30%. R4 (leaders) systematically represent the smallest proportion of respondents in all dedication ranges, typically around 10–13%, indicating a lower overall involvement in direct information searching, and a shift toward managerial and supervisory responsibilities.

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Figure 1. Time spent searching for academic information per week by research career stage and gender

Gender differences are generally modest, although some variations emerge in specific contexts. In the lowest dedication category (<1h per week), women in the postdoctoral stage (43.3%) are more represented than men (30.6%), suggesting a greater concentration of female postdoctoral researchers in this category. However, these differences diminish in the intermediate ranges of dedication. In the 5–10h interval, for example, the distribution of male and female researchers across career stages is nearly symmetrical, particularly among R3 researchers. Some gender differences reappear at the highest levels of dedication. Among independent researchers (R3), men show a higher presence in the >20h category, whereas among research leaders (R4), women represent a larger share of those dedicating more than 20 hours per week to information searching. Overall, the results indicate that career stage is the main factor structuring information-seeking intensity, while gender differences appear only in specific segments of the distribution.

Regarding the differences across research fields, these are relatively small and mainly affect the intensity of search rather than its overall structure. While applied sciences show a slightly higher presence in the upper time categories (10–20h: 17.4%; >20h: 10.7%), and social sciences concentrate more in intermediate ranges (5–10h: 32.1%), the overall pattern remains consistent across fields, with most researchers dedicating between one and five hours per week to academic search (e.g., natural sciences: 43.8%; health sciences: 43.5%; social sciences: 39.0%; humanities: 39.7%).

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3.2. Reasons for searching

The most frequently mentioned reasons for searching for scientific information highlight the core tasks of academic activity: staying up to date in their fields and conducting systematic reviews were reported as “often” or “very often” by 78.5% and 72.2% of the respondents, respectively (Figure 2). The frequency of searches to complete research proposals (67%) also stands out, closely linked to conducting literature reviews, whereas searches for solutions to methodological problems (60.3%) are common but less often conducted.

These patterns remain broadly consistent across research fields, gender, and career stages. In most subgroups, staying up to date in one’s field is the most frequent reason for searching, with particularly high values among male R4 respondents in applied sciences (89.1%), health sciences (88.6%), and social sciences (87.7%), and among female R3 respondents in applied sciences (88.6%), health sciences (86.9%), and humanities (87.5%). Conducting literature reviews also shows consistently high percentages, especially in social sciences, where it reaches 83.5% among female R1 respondents, 84.4% among female R2 respondents, and 88.0% among male R1 respondents. By contrast, more specialized purposes are less common, such as searching for information about candidates in assessment processes, which generally remains below 20% in early- and mid-career groups, and conducting bibliometric analyses, which is usually below 30% in most profiles. Overall, these subgroup differences reflect variation in intensity rather than substantial changes in the main hierarchy of search purposes.

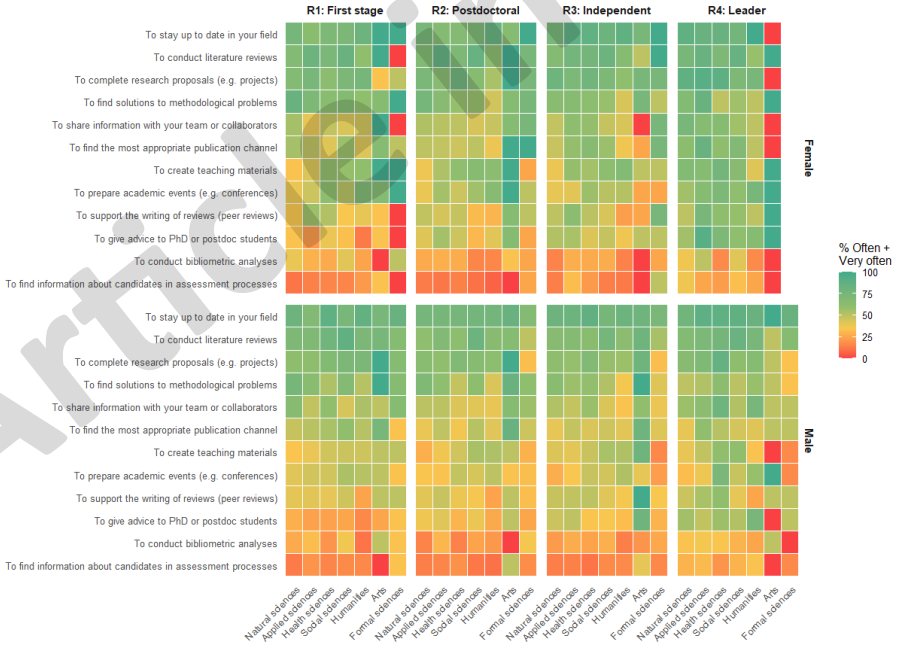


Figure 2. Academic searching by purpose, field, gender and career stage.

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3.3. Changes in search habits

Most respondents reported some degree of change since 2020. Specifically, 41.6% indicated that their search habits had changed slightly, while 23.4% reported significant changes, compared to 35.1% who stated that their habits had not really changed (Figure 3).

Overall, respondents report a moderate increase in the time dedicated to searching for academic information since 2020 (39.7% increased vs. 21.9% decreased), although a substantial proportion report no change (38.4%). In contrast, more specific aspects of the search process tend to show a different pattern, with decreases slightly outweighing increases, such as in the time needed to find relevant material (35.3% vs. 29.8%) or to create accurate search queries (33.3% vs. 27.1%). These patterns are consistent across gender and research fields, while career stage shows clearer variation, with early-career researchers more frequently reporting increases in overall search time (54.1% in R1) compared to more advanced stages (32.4% in R3 and 32.7% in R4). Differences by gender are minimal (e.g., increased weekly search time: 40.2% among women vs. 39.5% among men), whereas some field-level variation is observed, with higher increases in health sciences (42.0%) and humanities (43.5%) (see Figure 3).

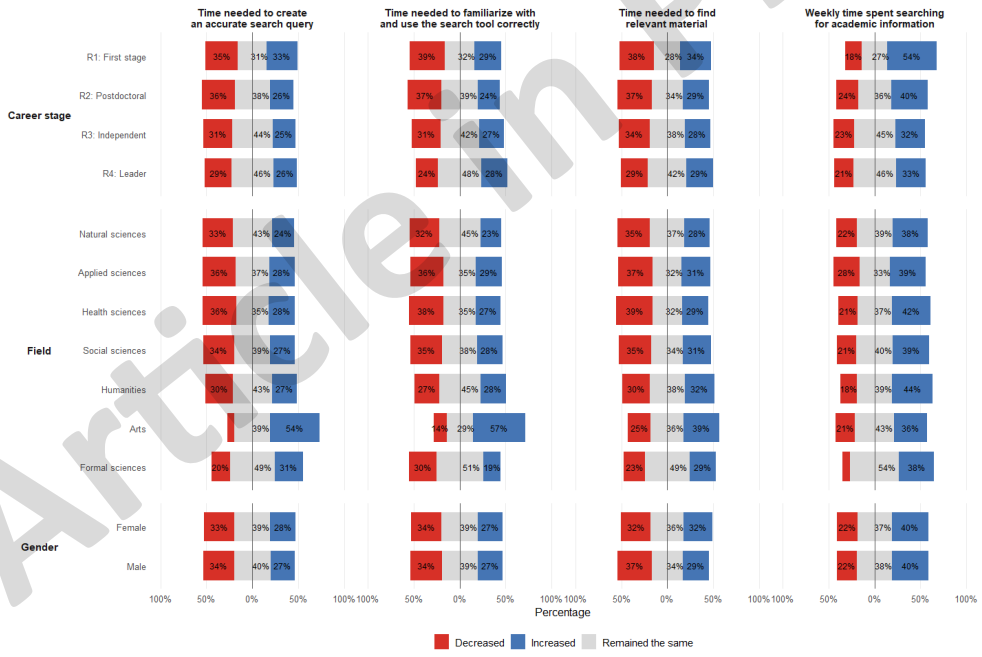


Figure 3. Changes in time dedicated to search-related activities since 2020

Regarding the factors influencing changes in search habits or time dedication since 2020, respondents most frequently pointed to technological drivers such as increased use of AI tools

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was the most reported factor (1,733 respondents; 51.7%), followed by the adoption of new search tools (1,436; 42.9%). Finally, a smaller proportion of respondents reported other reasons (372; 11.1%) (see Figure 4).

Subgroup analysis reveals a highly consistent pattern across gender, research fields, and career stages, with technological factors clearly dominating in all cases. The influence of AI tools remains remarkably stable across groups (typically around 17-19%), reinforcing its role as a systemic driver of change. In contrast, career stage introduces more noticeable variation in time-related factors, with early-career researchers reporting higher increases in time dedicated to research (15.4% in R1 compared to 10.9% in R4).

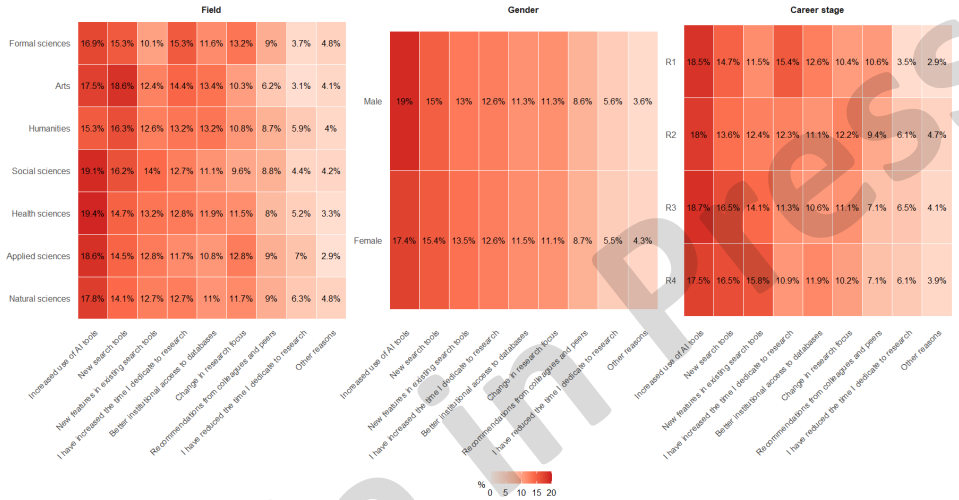


Figure 4. Factors influencing changes in search habits by subgroup

4. Conclusions

The results show that most researchers dedicate a limited but regular amount of time to searching for academic information, with the majority reporting between one and five hours per week. Career stage emerges as the main factor shaping this distribution. Independent researchers (R3) consistently represent the largest share across time categories, suggesting particularly intensive engagement with scholarly discovery at this stage. In contrast, research leaders (R4) appear less involved in direct searching activities.

The motivations for academic search are highly consistent across disciplines, gender, and career stages. Staying up to date in one's field and conducting literature reviews clearly dominate as the most frequent purposes, reflecting the central role of search in supporting core research activities. Other motivations, such as identifying methodological solutions or searching

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information for evaluation processes, appear less frequently and reflect more specific or situational information needs.

Most respondents report some degree of change in their search habits since 2020, although these changes appear gradual rather than disruptive. Early-career researchers are more likely to report increases in the time devoted to search activities, while more senior researchers show more stable patterns. Across all groups, technological developments—particularly the growing use of AI-based tools and new search platforms—are identified as the main drivers influencing these evolving search practices.

This study has limitations that should be considered when interpreting the results. First, the findings rely on self-reported survey data and therefore reflect perceived rather than directly observed search behavior, which may introduce bias. Second, although the sample is large, it is not fully representative of the global research population, as voluntary participation may overrepresent digitally engaged researchers. Third, the cross-sectional design does not allow causal inference or direct observation of changes over time, capturing only perceptions of change since 2020. Finally, some subgroup analyses, particularly in smaller fields such as fine arts, should be interpreted cautiously due to limited sample sizes, and the rapid evolution of AI-based tools means the results reflect a specific moment in a rapidly changing search ecosystem.

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