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Where Will AI Take Scholarly Communication? Voices From the Research Frontline

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ABSTRACT

Early career researchers (ECRs) are in an ideal position to soothsay. Yet, much of what we know about the impact of artificial intelligence (AI) comes from vested interest groups, such as publishers, tech companies and industry leaders, which are strong on hyperbole, are superficial and, at best, narrow surveys. This paper seeks to redress this by providing deep empirical data from researchers, allowing us to hear researchers' views and 'voices'. The data comes from a project, which focuses on the impact of AI on scholarly communications. From this study, we report on the perceived transformations to the scholarly communications system by AI and other forces. We were especially interested in discovering what future ECRs foresaw for the established pillars of the system—journals and libraries. The interview-based study covers a convenience sample of 91 ECRs from all disciplines and half a dozen countries. The main findings being that while the large majority thought there would be a transformation there was no consensus as to what a transformation would look like, but there was agreement on it being one shaped by AI. The future appears rosy for journals, but less so for libraries and, importantly, for most ECRs, too.

1 | Introduction

As part of the third phase of the Harbingers project studying international early career researchers (ECRs) from all disciplines (2024)[1], they were asked more than 50 questions in long, open-ended interviews both about a broad range of their scholarly communications and the impact of AI on many of them[2]. Some of what we have discovered has already been published in this journal (Nicholas, Świgoń, et al. 2024; Nicholas, Abrizah, et al. 2024), but here we concentrate on something new and strategic: the transformations and long-term changes to the scholarly communications system occasioned by AI, which were asked about towards the end of an interview.

What we sought to discover was whether ECRs, who are after all the harbingers of change, as we have found in our previous studies (Nicholas et al. 2017, 2019, 2022; Nicholas, Herman, Boukacem-Zeghmouri, et al. 2023), foresee transformative change to scholarly communications because of AI. If so, what will it look like? And if no change is expected, why not? ECRs are, of course, the perfect group to ask, and not only because they are in the research frontline, in the very thick of it (Nicholas, Herman, Clark, et al. 2023), but also because they are the most likely to be affected, as juniors, by the oft-heard threat that AI may lead to replacement of human employees (Dwivedi et al. 2023). Yet the massively expanding literature on the topic is full of utterances from publishers, librarians, pundits, industry 'leaders' and marketeers—foresight for business, we might

Summary

- Fills a knowledge gap on what ECRs as soothsayers say about the transformative aspects of AI.
- A large majority of ECRs envisaged a transformational change of scholarly communications coming
- Less clear is what that transformation would entail with 20 visualisations proffered, with an improved, more efficient, and open scholarly system topping the list.
- Not unexpectedly, the driving force behind transformational change was thought to be AI, with more than two-thirds of all ECRs believing this.
- Journals are thought to reign supreme, but questions are being asked of libraries.

call it—whilst the 'voices' of researchers, not to say the ECRs among them, are hardly ever heard (see, for instance, the following literature review). This paper aims to redress this worrying imbalance, especially as in the current data vacuum things can go awry and not as expected.

Thus, we are bringing in this paper not just the views of nearly a 100 frontline researchers from around the world, whose research encompasses all subjects, but conducted it in such a way as to capture it in their own voices, so ensuring we are even closer to that frontline. Another great benefit of our methodological approach, is that we did not ask for their views on transformational or major change in isolation, but, importantly, measured against their views on the existing scholarly communication system, whose two main pillars—journals and libraries—seemed to have ridden out so many allegedly 'transformative' changes.

Finally, it should be mentioned right at the outset that our ECR cohort, while junior in status, was very experienced and published researchers, at the forefront of research. They knew what they were talking about when it comes to forecasting change.

2 | Aims

The broad aim of the research was to find out where AI will take scholarly communications according to ECRs. More specifically, we wanted to know:

1. What their vision of a transformed scholarly communications system would look like and, indeed, whether they thought there would be one?
2. Whether they thought that key elements of the existing system, such as journals and libraries, would still have a central role to play 10 years down the line?
3. Whether they thought that AI would prove to be *the* transformational force and whether that would be beneficial.

We sought to do this by reporting what they said very much in their own words through comments and quotes, by giving ECRs high degrees of freedom in what they told us, by asking broad and open questions, each one informing the next in a conversational tone. In addition, with interviewers talking to them in their own language and sitting back and listening as much as possible. We wanted, above all else, their visions of the future and not those that preoccupy the industry or older and more mature researchers.

3 | Working Definitions

3.1 | Transformative

By 'transformative' we mean life-changing, industry-changing, work-changing, and all markedly and fundamentally changing. It is clearly a word that can be used differently, and we were interested in how ECRs interpreted it.

3.2 | Early Career Researchers

Lacking a universally accepted definition, a pragmatic concept of the ECR has been adopted. It focuses on common factors: their being employed in a research position, being relatively young, in an early phase of their career, not yet established as permanent faculty. Thus: Researchers who are generally not much older than 40[3], who either have received their doctorate and are currently in a research position or have been in research positions, and are currently doing a doctorate. In neither case are they in established or tenured positions. In the case of academics, some are non-tenure line faculty research employees.

3.3 | Subject

All throughout the life of the Harbingers project we have covered science and social science ECRs, but we are pleased to announce the inclusion of the arts and humanities in this study and given the relatively high numbers included (33, over a third of the cohort) we are at least in the position to make some exploratory comparisons between them and those in other disciplines.

3.4 | Artificial Intelligence

AI has no firm or formal definition. Consequently, when asking about attitudes to and anticipations of the place of AI it necessary to consider—what do you actually mean by AI and we had several questions which disclosed that. Furthermore, the quotes throughout the AI questions suggest a variety of software and 'apps' are considered by some to be 'AI'. By collecting this data, we aimed to establish both the differences and similarities in how AI is defined. We were seeking definitions based on literary warrant.

4 | Literature Review

Two years to the day since the release of the open-access chatbot ChatGPT unleashed a frenzy of interest in artificial intelligence (AI) and there is a considerable and growing body of expert appreciations of their scholarly potential. Perhaps, the best known

among them is Dwivedi et al.'s (2023) wide-ranging paper. Bringing together 43 contributions from experts in fields such as computer science, marketing, information systems, education, policy, hospitality and tourism, management, publishing, and nursing, it offers multidisciplinary perspectives on opportunities, challenges and implications of AI for research, practice and policy. One of their main conclusions is that it is academic research that will experience some of the most transformative impacts.

They are not alone in thinking so: the host of studies, editorials, opinion pieces and deliberations on the topic all reflect a consensual opinion that AI-enabled platforms and techniques hold great promise for enhancing, perhaps even revolutionising traditional ways and means of conducting research (for a review see Herman et al. 2024). True, a recurring theme in the analyses of the implications of introducing AI to research is that the move necessitates exercising great caution, for the AI-afforded opportunities come with considerable risks, too. Thus, as Susarla et al. (2023) suggest, the potential for AI to transform research lies in the scholarly community's ability to harness its strengths, address its limitations, and forge a path forward for its prudent use.

Indeed so, which is why experts agree that AI will accelerate change within the scholarly world, but debate the extent of the change to come. Thus, for example, a Ithaka S-R report, reporting the views of just 12 interviewees representing publishers, librarians, scholarly societies, and funders, leaves no doubt that AI-fuelled change is indeed in the air. However, whilst some experts thought that AI created a transformative wave, so much so that we are already on the cusp of a third digital transformation, the more commonly held opinion was that the efficiency gains it afforded made publishing function better, but did not fundamentally alter its dynamics or purpose (Bergstrom and Ruediger 2024).

The intriguing question which follows from these forecasts is, of course, what the actual happenings on the ground are: what do the researchers themselves think of AI-assisted scientific work and to what extent do they avail themselves of the novel ways and means of doing research that AI affords? At this early stage of the AI-driven developments, our understandings of researchers' views and practices are patchy: not only are empirical studies on the topic few and far between, but even those already available are often small scale and limited in scope, since they focus on one country and/or one discipline and/or one specific aspect of the topic.

Three exceptions are the *Nature* studies conducted in 2023, one of the earliest studies to investigate the utilisation of AI for scientific research, all of which cast a wide net to capture a snapshot of the then-prevailing situation. The first, a survey that yielded 672 responses from readers who responded to an online questionnaire shortly after the advent of ChatGPT, indicated that around 80% of them had already used the chatbot or a similar AI tool at least once, but 57% said they used them only for 'creative fun' (Owens 2023). Another survey, this time of more than 1600 researchers around the world, looked at the positive and the negative impacts of AI-powered tools, the frequency of their use, the purposes to which they were utilised, the benefits and problems associated with their use, their capability to assist in reviewing articles, their anticipated usefulness and the existence of barriers to progress. The findings indicated increasing use of artificial-intelligence tools in research, with scientists expressing concern as well as excitement at the prospect of integrating AI in their scholarly undertakings (Van Noorden and Perkel 2023). A third survey, this time among 3838 self-selecting respondents from 93 countries, which targeted specifically postdocs, explored how they were using artificial intelligence chatbots. It found that roughly one-third of respondents did use AI to refine text, write code or organise the literature, but around two-thirds of them did not feel that AI had changed their day-to-day work and career plans (Nordling 2023).

However, as noted, the available empirical studies into the potential and/or extant uses of AI for scholarly purposes tend to be rather focussed. Thus, for example, two additional early studies into the introduction of ChatGPT to the scholarly world looked at specific disciplinary cohorts with the express aim of finding out their attitudes and experiences. The first surveyed education, research and healthcare faculty participants in a hybrid (virtual and in-person) panel discussion event. Only 40% of the 420 attendees had tried ChatGPT, but the juniors among them (trainees) were not only more interested in using the technology than their senior colleagues, having more positive views, interest, and acceptability beliefs in using it, but more of them had already tried it, too (Hosseini et al. 2023). The second early study also looked at researchers in the healthcare sector, this time to understand their perceptions of and emotions towards ChatGPT via sentiment analysis of their tweets on the topic. 33% of the tweets were found to reflect positive sentiments, 14% negative sentiments, and, rather interestingly, 51%—neutral sentiments (Praveen and Vajrobol 2023).

By the same token, a recently published Ithaka study is also discipline-specific, setting out as it does to better understand how biomedical researchers think about and use generative AI in their research (Ruediger et al. 2024). Deliberately so, and with good reason, too, for, as the authors explain, biomedical research is at the forefront of generative AI-enhanced research. Obviously, though, the nuanced insights thus gained into biomedical researchers' attitudes to and uses of AI, whilst critical to informed decision making about how to support this specific disciplinary cohort, cannot be directly transported to the research enterprise.

Other studies, too, are focused in their approach, if in different ways. Thus, for example, a small study, conducted in the summer of 2023 in one institution, only looked at the local faculty's expectations and their preparedness for Generative AI to aid academic research. It found that 70% of the 92 respondents, although expressing both enthusiasm and concern at the prospect of using AI-based tools and platforms, had no knowledge or only conceptual understanding (as opposed to hands-on practice) with generative AI (Liu and Jagadish 2024).

Another survey study, quite wide-ranging in its coverage of topics and size (around 2500 participants), but reflecting the situation in one country only, Denmark, explored the use of generative AI for research. The study, currently disseminated only as a preprint, evaluated 32 AI use cases across five research phases: idea generation, research design, data collection, data analysis, and writing/reporting. The perceptions, thus, identified fell into

three clusters: GenAI as a work horse, GenAI as a language assistant only and GenAI as a research accelerator. The views as to the research integrity implications of each use varied, with language editing and data analysis accorded a more positive reception than experiment design and peer review tasks. Here again, junior researchers used AI more than their senior colleagues (Andersen et al. 2024).

Yet another survey, which took a comprehensive approach to the various aspects of AI integration into research undertaking, was conducted by the European Research Council, to explore researchers' then-current use of AI and their views on future developments. However, as the study targeted ERC grantees already using or developing AI, its findings obviously highlight the views of biased audiences. It is perhaps not very surprising then that the majority of the respondents, when asked to envision the development of AI in the scientific process by 2030, both in general and within their specific fields, said that AI will serve as a support tool, play a pivotal or essential role, and, in some cases, even accelerate, revolutionise, or transform certain elements of the scientific process or of their own field (ERC—European Research Council 2023).

5 | Methodology

5.1 | Recruitment of Interviewees

National interviewers (from China, Malaysia, Poland, Portugal, Spain, UK and US), recruited ECRs on the basis of the definition outlined earlier (and used in all Harbingers studies) using their local research networks and connections supplemented by mail-outs from scholarly publisher lists. For the pilot, each country was originally allocated a potential quota of interviewees (10); however, it did not turn out quite like that. Malaysia, Portugal, and Spain did recruit 10. However, in China it turned out to be a very hot topic and 21 eager ECRs were recruited; in the case of Poland, 32 were recruited, and this was thanks to local funding (National Science Centre no. 2022/45/B/HS2/00041) providing the opportunity, for the very first time in the history of Harbingers to include arts and humanities (22 of them) and the UK/US were represented by just 7 ECRs due to time constraints. Given the pilot and exploratory nature of the project, the imbalance in country coverage was not thought to be a problem, and the importance of China internationally, the opportunity to increase the size of the pilot to 90 ECRs and the attraction of extending the study to the arts and humanities more than made up for it. What we ended up with, of course, was a convenience sample.

Interviewees included both ECRs who participated in Harbingers-2 and were happy to continue (26 of them) and new ones, recruited to fill the ranks of participants who had left research, no longer qualified as ECRs, or declined because of work commitments or lack of interest. Interviewers generally interviewed people in their own universities, and we collected demographic data from ECRs, and this provided an insurance that we were all on the same page when it came to identifying ECRs.

The breakdown of the ECR cohort by country, discipline, gender and age band is given in Table 1. Note especially the age of the cohort and how many relatively old researchers there are.

TABLE 1 | Demographic breakdown of cohort.

Discipline										
	CHEM	**ENV**	**HUM/ARTS**	**LIFE**	**MATH**	**MED**	**PHY**	**SOCH**[a]	**SOCS**[b]	**Total**
N	7	4	23	6	9	12	16	5	9	91
%	8%	4%	25%	7%	10%	13%	18%	5%	10%	100%
Country										
	CN	**ES**	**GB**	**MY**	**PL**	**PT**	**US**			**Total**
N	22	10	3	10	32	10	4			91
%	24%	11%	3%	11%	35%	11%	4%			100%
Age										
	Youngest (26–30)	**Younger than most (30–34)**	**Median (35–37)**	**Older than most (37–39)**	**Oldest (39–51)**	**N/A**	**Median**			**Total**
N	18	18	18	18	18	1	36			91
%	20%	20%	20%	20%	20%	1%				100%
Gender										
			Male	**Female**						**Total**
N			43	48						91
%			47%	53%						

[a]Includes Economics and Business, Geography and Psychology.
[b]Includes Anthropology, Politics and Sociology.

There are three reasons for this. First, for this pilot, for reasons of convenience, we are retaining ECRs from previous stages of the project and hence they are all a year or two older. Second, it is the nature of academic, or indeed any employment, that not everyone moves forever upward. Third, some of the researchers who were ECRs at the time of Harbingers-2 have since become tenured and are included in the cohort.

It was a convenience sample for a pathfinder project, so we cannot claim it is representative. ECRs were selected using criteria drawn up in terms of age, status, gender, and discipline.

5.2 | Data Collection

Semi-structured, free flowing interviews of 60–90 min in duration were the main source of data, and this was supplemented by the professional knowledge of the national interviewers. The interview schedule consisted of 7 pages of questions[4], covering broad AI matters, an exhaustive range of general scholarly communication questions, and questions about the impact of AI on scholarly activities. However, this paper focuses principally on the 5 transformative-leaning questions, and these questions can be found in Section 6.

5.3 | Data Analysis

All interview transcripts, accepted by ECRs as being correct, were translated to English where necessary and transferred by the national interviewers to a coding sheet, which closely matched the questions of the original interview schedule but left room for information derived from additional enquiries or clarifications during the interview process. The coding sheets were multi-faceted, containing quantitative and qualitative data, and a question could generate both. For each question, the coding sheet captured the interviewee's response in three ways: (1) as a code (e.g., Y/N); (2) as a quotation; (3) and as an explanatory comment from the interviewer. We refer to (2) and (3) as being free-text[5]. A coding was only applied to questions where it was reasonable to anticipate a limited and unequivocal range of responses. Free-text comments were subject to a thematic analysis by a member of the research team who was not directly involved in the interviewing in order to obtain an overarching and standard analysis.

6 | Results

First, we present the interview data in order of the individual and relevant questions asked, and then we provide an overview of the data by country.

6.1 | Interview Data

The questioning about transformational change started with an open and unrestricted question in which AI was not actually mentioned; although, of course, ECRs had been asked many questions about the impact of AI on such scholarly communications topics, such as peer review, reputation, and discovery. So, they had been prepped for such a question and had AI very much in their minds. It also enabled them to mention other agents of change. Aware also that the established system had been buffeted much in the past by so-called transformative events yet still retained its basic shape and characteristics, we did not want to constrain them in any way. While still interested in context and the health of the existing system, we then moved on to asking them about the sustainability and strength of two of the main pillars of the established system—journals and libraries. Only then, after they had considered the main assets of the existing system, did we ask directly for their transformative opinions on AI.

6.1.1 | Transformed Scholarly Communications

The opening question—really an ice-breaker—addressed the topic very broadly indeed without any leading or prompting and asked: *What form do they think a transformed scholarly communications system might take*? This was a catch-all question giving ECRs full room and responsibility for what they said. This is its strength. Having said that, we were particularly interested in learning whether open science would be raised, as it is often heralded as a transformative and beneficial force. Of course, ECRs might not foresee any changes at all or desire any. We conducted a keyword analysis to get an idea of what types of scenarios they foresaw.

Three-quarters of the 85 ECRs who commented envisaged a transformational change. Of the rest, they either felt there would be no change (5) or that they just did not know enough to say anything (15) and nearly half of these came from one country—China (9/22). Indeed, there did not see much passion for change or answering the question in this country's case.

Even the ECRs who came up with visions or suggestions were not always very clear or specific about what they foresaw or wished, and this could be partly due to the fact that they have so much choice; it was not easy to express and translate, and there was not one single thing that they could put their finger on. Certainly, there was little consensus, with more than 20 different visualisations proffered, a rich range indeed. Just 8/85 ECRs mentioned AI, although it topped the list regarding most mentions. Open science (7 ECRs) came next, and that was followed by better peer review and improved evaluation.

What follows is 13 visualisations or forecasts, which garnered some support with illustrative quotations provided, with more quotes given for the most subscribed-to visualisations.

1. An improved and more efficient scholarly system

We'll see a more significant transformation with increased use of AI technology on academic and social media platforms. Even scientific info is making its way onto Tik Tok and YouTube. However, traditional journals are still essential. [Malaysian mathematical scientist].

The application of artificial intelligence will promote efficient communication and also ensure a certain quality. [Chinese physical scientist].

Assuming that the transformative force would be 'AI', I see 'AI' tools for validating research results; reviewing literature; checking

facts. This is *from a first validation perspective, before passing on to a panel of experts for review. AI could also make it easier for publications to reach their target audience*. [Portuguese mathematical scientist].

2. A more open system

We should focus more on quality and transparency rather than just publishing a lot. Without embracing openness and open science, we might keep the current system that rewards publishing a lot. I want to write because I value knowledge, not just to meet requirements. [Malaysian mathematical scientist].

We need to move towards open science, open journals, open data, because it is unacceptable that we have to use SciHub due to a lack of money for expensive subscriptions to international journals. [Polish humanities ECR].

In addition, these transformations should definitely go in the direction of open access, *especially to scientific journals* (*with open access to books it would have to solve the problem of printing costs, I do not know how it works*). [Polish humanities ECR].

Open science, but still peer-reviewed and where quality outweighs quantity. Nowadays, *everything is a reason for publication and a lot of research that could yield an article, given the need to comply with metrics, is broken down into several publications, many of which have no additional relevance*. [Portuguese mathematical scientist].

3. A more digital system (for the humanities)

A transformed science communication system could take advantage of the potential of the Internet and social media. Instead of traditional book publications, there could be multimedia video publications. (...) *New forms of publishing*, for example, *podcasting, app development*. [Polish humanities ECR].

We can expect an emphasis on online communication, more online conferences, the emergence of various new community groups of scientists, the development of open science, open access to scientific materials, and *the digitization of many archival sources. In the discipline of history, such openness will probably come later than in other fields, because we, however, work on sources that are difficult to access, stored in archives in different countries*. [Polish humanities ECR].

But not everybody wanted this even in the humanities as this Polish ECR explains:

> I fear that the system will take the form of too much digitization, including the dying out of traditional conferences, and that human relations will suffer. (...) It can be assumed that scientific communication in a few years will not look quite like it does today.

4. A system with improved peer review mechanisms

For a Polish mathematical scientist, it was the selection of reviewers that needed improving:

It seems to me that the main problem is the current system of reviewing papers, which cripples the selection of reviewers depending on the subject of the paper. I often get the impression that the reviewers do not fully know the basics of the field. On the other hand, by choosing someone who publishes in the same field, it can create some conflict of interest. I do not know the solution to this problem, but I feel a strong need for change.

A Chinese physical scientist was looking for greater speed:

Artificial intelligence can speed up the review process and promote more fairness and transparency in the review.

A system which paid reviewers was the wish of Polish humanities ECR:

A significant improvement in the system of scientific communication would follow the establishment of well-funded publishing structures in which reviewers would be paid. Paying reviewers would expand the pool of scientists willing to write reviews and improve the accuracy of reviews. Each publication should be reviewed by a minimum of two paid reviewers and corrected by an editor.

5. An improved evaluation system

A Chinese soft social scientist wanted greater recognition for the contributions of authors beyond the first and corresponding authors when publishing as a team could encourage teamwork and innovation.

And this from a Chinese mathematical scientist: *I'm not sure but I think that just new evaluation indicators and assessment mechanisms will be added down the road*.

Research evaluation could be based on the quality and actual contribution of a work, rather than relying heavily on metrics such as journal impact factor. Likewise, instead of depending on traditional academic journals, researchers could publish their results directly in repositories or online platforms, eliminating intermediaries and associated costs. [Spanish mathematical scientist].

6. A system embracing the social media more

I think it will be more like social media because of easy access, including access on mobile devices—Facebook or LinkedIn. It could also be instant messengers like Discord or Slack, which are actively used by representatives of other disciplines. (...) *In my opinion, open access to scientific publications* (*including scientific monographs*) *should become a common and mandatory practice*. [Polish humanities ECR].

Certainly, in transforming the system of scholarly communication, it would be worthwhile to use the tools provided by social media. The idea is to communicate more directly, only mediated by scientific publications. I observe in younger researchers without a doctoral degree a natural desire to boast on social media, for example, the publication of their article. This is good, but it should not be mandatory, but voluntary. [Polish humanities ECR].

A Polish humanities ECR pointed out the changing social media landscape:

Social media is changing, FB [Facebook] is no longer academically useful, Tik Tok and Instagram are growing in strength. (...) *Tik Tok may also be the future of advertising for individual researchers who can do it*.

7. A system that embraces outreach more

There is an opportunity and the changes will be very much centred on the dissemination of science, valuing communication with society, rather than other more rigorous publications. Less science, more citizen component. I don't know if this is exactly an advantage for science. [Portuguese chemist].

A system that communicates preferentially with society directly, in particular with political decision-makers, industry, civil society and individual citizens, instead of only communicating inwards, in a closed, totally monotonous and anti-innovation loop. [Portuguese hard social scientist]

8. Faster, more frequent and shorter communications

In order to pursue the efficiency of information dissemination, online, short, frequency and fast communication methods will become more frequent. [Chinese physical scientist].

9. A system in which journals are paramount

But with more technology, no doubt as a result of AI:

Probably with much more involvement of technology. It is difficult for me to imagine a communication system without scientific journals. [Spanish chemical scientist]

10. A more oral scholarly communication system

Possibly a surprising suggestion from a Chinese mathematical scientist: *Being able to explain what you have done in spoken language is more efficient. If you can articulate it verbally, it's quicker for someone who's just starting to understand what's involved, grasp the concepts, and then delve into specific areas of interest. This is still valuable*.

11. A changed funding system for the humanities

The grant system in Poland needs to be changed. Our NCN is not adapted to the humanities at all; you can see this in the forms that were prepared for the sciences, for quantitative methods. (...). *The point system undervalues my philosophical work*. [Polish humanities ECR].

12. A cheaper system

That publication costs be regulated, since they are skyrocketing and mean that works cannot be published in highly reputable journals due to the lack of funds to pay publishers. [Spanish life scientist].

Paid publishing needs to be abolished because it breeds manipulation and inequality, because, for example, authors from poorer universities do not have money for paid publications. [Polish humanities ECR].

No change.

Finally, there were those—mainly Spanish—that thought there would be no real change unless the fundamentals changed. Such as the way jobs were set up, how pressurised they were, and the traditional evaluation system.

I'm not sure how a new system of scientific communication could be implemented while the evaluations we are subjected to do not change. The evaluation criteria should be diversified and other metrics apart from the IF should be considered: citations, downloads ... It seems that steps are being taken along those lines in Spain [Spanish chemical scientist].

There is a lot of competition to get a permanent position at the university or in a research centre. To succeed, you have to consider the current evaluation criteria; if you do not follow the path, you can be 'penalised' ... So, although we think that the communication system could change and evolve, deep down we need to adjust to the path marked to get that position ... After 10 years working tirelessly, if you are lucky and get that permanent position, when you can already play the role of change, you are so tired that everything does not matter to you. On the other hand, I think it would be absurd to dedicate yourself to publishing low-quality articles written by AI in predatory journals because you will never reach that position. [Spanish environmental scientist].

6.1.2 | Future of Journals

The question asked: *Do they think that journals will still have a central role to play in 10 years' time?* This question was one that primarily attracted a coded response of the yes, no and don't know kind. However, in addition, a large number (over 70) also provided a comment. Most of those who did not provide comments were Chinese ECRs.

Journals are central to science and social science (less so arts and humanities) as a means of ensuring trusted scholarly dissemination and reputation and which have largely come out unscathed from the digital and social media revolutions; indeed, they have prospered thanks to OA and greater paper productivity. So, what we wanted to know was whether ECRs felt this would continue in the future. We had previously asked about this in Harbingers earlier studies using a 5-year future window, but ECRs and interviewers had said that was too short a time for things to change fundamentally, so we moved to a 10-year window.

It turns out that there seems to be an ironclad belief that journals will have a central role to play a decade down the line. This is one of the highest yes votes we have received for any question we have asked. Thus, 81% of all ECRs thought this, 86% if we only include people who answered the question (Table 2). And what is more, the question did pose a high bar what with specifying both *central* and *decade*. The response was also a universal one as there was also hardly any

TABLE 2 | Journals to have a central role in 10 years? Country analysis.

	Total	CN	ES	GB	MY	PL	PT	US
Don't know	6 (7%)	3	0	0	0	3	0	0
No	6 (7%)	1	1	0	0	2	2	0
Yes	74 (81%)	18	9	1	9	27	8	2
Didn't answer	5 (5%)	0	0	2	1	0	0	2
Total	91 (100%)	22	10	3	10	32	10	4

TABLE 3 | Journals to have a central role in 10 years? Subject analysis.

	Total	ART	CHEM	ENV	HUM	LIFE	MATH	MED	PHY	SOCH	SOCS
Don't know	6	3	0	0	0	0	0	0	3	0	0
No	6	1	0	1	0	1	0	1	1	1	0
Yes	74	1	6	3	18	5	9	10	10	4	8
Didn't answer	5	0	1	0	0	0	0	1	2	0	1
Total	91	5	7	4	18	6	9	12	16	5	9

difference according to country, subject (aside from the small arts group; Table 3), age (although older ECRs were slightly more likely to be in the yes group) and gender. All this, despite fears of a dumbing down of articles because of AI, fears of a growing predatory population driven by APCs, and general worries about the quality of peer review.

A representative and illustrative selection of quotes follows, and we will deal with those that said Yes first. It is clear from the yes quotes that quite a few ECRs believe that there are no substitutes for journals, but they have reservations about them (and their publishers).

A Malaysian mathematical scientist highlighted the fact that what was so good about them was that they were a trusted source: *Absolutely! Even with the integration of AI. Where else do we have scholarly content with certain standards of rigour and relevance, assessed by experts, maintaining the integrity and reliability of research*.

A British life scientist's "Yes" referred to the stranglehold and financial strength top publishers have: *If journals are losing traction, the big publishing houses will make sure that they remain on top*.

A Malaysian chemist acknowledged the challenges journals face, but was not convinced they would be challenged in the end and felt the OA has in fact boosted their fortunes: *Journals aren't dead, not yet. They remain crucial, especially with open access. Some researchers speculate that they might fade away since articles are seen as more valuable, but we're yet to witness that shift*. [Malaysian chemist].

While a yes, this response from a Malaysian hard social scientist came with strings attached, as so many did: *Yes, but many researchers complain that they do the research, apply for grants, and write up the papers, but journals make money from their work and they do not get anything*.

> A Portuguese life scientist thought yes, *but only in an online format. Physical publication no longer makes sense*.

> A Malaysian mathematical scientist also said yes, but: *in 10 years' time yes, but maybe [published] at the article level. However, new communication methods like social media could make traditional journal publishing less important. Ideas spread quickly and interactively through these platforms. With AI, verifying content authenticity becomes easier. This could make journal publishing less relevant*.

> A thoughtful Polish arts ECR was unsure: *I don't know. I am watching the development of artificial intelligence and I am concerned about the numerous cases of misinformation or the inability to verify the information obtained (e.g., from the GPT chat). On that account, it seems that the role of an editor or supervisor will have to be the guarantor of the reliability of the information*.

Now, to the relatively few researchers who though journals had no long-term future:

First, this wide-ranging criticism from a Portuguese hard social scientist: *I hope not! It's too closed, opaque, partial, elitist, discretionary and highly commercialised. Everything science shouldn't be*.

Second, this quote from a Portuguese life scientist had critical bite, too: *I hope not, since they profit from work funded by other*

institutions and generated by people who are not paid and lose the copyright to publish. I hope that a reliable alternative will be found in the future.

6.1.3 | Future of Libraries

The question was: *What role do you think libraries will have for researchers in 10 years' time as compared with their current role, especially in light of the growing utilisation of 'AI'*?

The question was phrased neutrally, not directly asking whether libraries had a brighter/darker future, or even a changed future. However, as can be seen, the responses came back together with value judgements on how libraries were fairing and what the future holds for them. Often, too, ECRs interpreted the question as asking how they would like to see libraries role play out in a decade rather than how they will play out.

Unlike journals, libraries have clearly been battered by digital events, losing their mediating and monopoly roles, and open access continuing to chip away at their role as warehouses for journals. In some ways, because of their large brick and mortar presence, declining status, and being relatively sidelined by ECRs, they appear to be rabbits in the headlights, but despite this, they continue to survive if not prospering, although some are doing better than others.

Eighty-four (92%) ECRs provided a response and were categorised as following:

1. Same role as now (35; 42% saying so)
2. Declining/weakening role (15; 18%)
3. No role at all (7; 8%)
4. Expanding role (16; 19%)
5. Platitudes, empty statements, and do not know (11; 13%)

So most (2 in 5) ECRs saw libraries staying much as they are today and some were happy with this. Nearly one-quarter of ECRs thought libraries are in trouble with either no future or a declining one. This, however, was balanced by one-fifth thinking that libraries would have an expanding role. Mixed messages here, but the overriding impression is that few ECRs are heavily or lightly engaged with their library. They see it distantly and narrowly. It is not mainstream.

Malaysians were wholly positive about an expanding role for libraries thanks to the intervention of AI. The Spanish were the most questioning and critical. It is difficult to interpret the findings from Polish ECRs. Nearly half of them and all A&H ECRs said no change and provided no support for their decision, so we do not know whether they were happy with that. However, the supposition is that it is libraries are important to them now and likely to be so a decade down the road. This was obvious to them. Further work needs to be done here, though.

Quite a few ECRs thought that the library had declined for them, so there is not much impact on them now and they thought that it would not change down the years. Thus, this is not a positive or optimistic opinion on libraries; it is not so good now and not so good in the future.

Using a metaphor, in 10 years' time I see AI as a librarian. With full knowledge of the collection, but without the disruptive capacity to do research in all areas of science. Libraries continue to play a central role for researchers, perhaps not in the format we know today. But there will always be a need for a repository of scientific work that is independent of publishers. [Portuguese mathematical scientist].

The same role as now.

> For a Polish life scientist, the scenario will see libraries as search engines and text repositories, as sources of online articles and books.

> For a Polish humanities ECR unless there is some big revolution involving the digitisation of books/resources (and I don't think there will be in the next 10 years), libraries/museums/archives etc. will continue to play an important role for historians.

A declining and weakening role.

Quite a few ECRs thought that AI would impact negatively on them, leaving them very weak, and most came from Iberia:

> A Spanish chemist: *I don't think they will be very useful. They will keep a piece of paper to enjoy a calm scientific reading. If we are working actively, I think that libraries will not be useful because AI will be able to do a good part of the information management work that libraries do right now.*

> A Portuguese mathematical scientist: *A very weak role, honestly. I believe that AI will be extremely useful for indexing. And searching for scientific material. I also believe that AI will play a central role in these areas.*

Another Portuguese mathematical scientist: *Using a metaphor, in 10 years' time I see AI as a librarian. With full knowledge of the collection, but without the disruptive capacity to do research in all areas of science.*

No role at all.

While the above quotes intimate that there might be very little role for libraries down the line, there were some ECRs who thought it was the end for them:

Libraries will also have to recycle and find their place, although I do not know what it should be. Possibly if the library learns to use AI to dispose of its funds, we will all win [Spanish medical scientist].

> A Portuguese soft social scientist foresaw libraries vanishing: *To be honest, these days I hardly use libraries and do everything from my computer.*

An expanding role.

It was largely the Malaysians that saw an expanding role for libraries and largely thanks to AI, something we have not heard before. The role perceived was a largely a training, advisory one.

Malaysian mathematical scientist: I think libraries need to scaleup their research capabilities as hubs for both traditional and cutting-edge research. Might transform into skills centres for training researchers in digital technology, AI tools, cloud computing, offer workshops and resources designed to sharpen our skills in areas such as RDM [research data management], data science, machine learning, and various AI applications. The focus should extend beyond information literacy, search skills and use of online databases.

Malaysian mathematical scientist: Libraries are becoming collaborative spaces. I do not think it is happening now about AI but in the next 10 years, libraries will likely change how they help researchers, especially with more AI use. They should become digital hubs, offer special AI support, manage data better, use AI for better information access, and help researchers with AI skills. If librarians may get better at AI, they can guide us on ethical AI practices, especially in digital and AI literacy.

6.2 | 4a AI as a Transformative Agent

We have seen AI raised already and there were two direct questions on AI, the first about its transformative qualities and the second a follow-up one on a major concern associated with AI—inequalities. The first question asked had two parts, containing both a qualitative and quantitative element: *Will 'AI' be a transformational force? If so, in what ways? What will be the advantages and disadvantages of the transformations that will take place?*

Of all the 20 or so AI questions asked in the study, this was one which received the highest level of overall agreement, with over two-thirds of all ECRs (62; 68%) thinking that AI would turn out to be a transformative force (Table 4). In fact, the percentage is much higher than that (78%) if we only count those that answered the question. This leads us to the belief that while ECRs are not actually sure of what aspects of scholarly communication would change because of AI, they were pretty sure that change there will be. However, there was an palpable uncertainty about this, with 28% of ECRs either saying they did not know or not answering the question in the first place. Poles were the least likely to think it would be a transformative force, with a quarter (8/32) saying so or not knowing. This is partly because of the large numbers of A&H ECRs among the Polish cohort, and they were less likely to think it would be transformative. By comparison, all the 5 Malaysian ECRs who responded said yes to transformation. The Chinese were also generally pro-transformation, with four-fifths (18/22) saying so and everyone answered. Portugal registered a similar positive outcome.

Numbers are low and difficult to read when you break down the data to the subject level, but there were 3 subjects where no ECR said it would not be transformative—chemistry, mathematical sciences, and medical sciences (Table 5). Leaving aside the subjects with very small cohorts, the highest proportion of ECRs believing it would prove transformative were those in the mathematical sciences (7/9) and medical sciences (9/12) and this cannot be surprising. The A&H ECRs had the highest overall proportion of ECRs saying no or do not know (8/23). They were followed by the soft social sciences.

Regarding age, possibly, unsurprisingly, the oldest cohort were the least likely to believe AI would be a transformational force with just 10/18 saying so, possibly, because they were more seasoned and had seen it all before (Table 6). The median group were the most likely to think so, with no one saying no.

TABLE 4 | Will 'AI' be a transformational force? Country analysis.

	Total	CN	ES	GB	MY	PL	PT	US
Don't know	6 (7%)	1	0	0	0	4	0	1
No	11 (12%)	3	2	0	0	4	2	0
Yes	62 (68%)	18	7	0	5	24	8	0
Didn't answer	12 (13%)	0	1	0	5	0	0	3
Total	91 (100%)	22	10	3	10	32	10	4

TABLE 5 | Will 'AI' be a transformational force? Subject analysis.

F04	Total	ART	CHEM	ENV	HUM	LIFE	MATH	MED	PHY	SOCH	SOCS
Don't know	6	1	0	0	3	0	1	1	0	0	0
No	11	1	0	1	3	1	0	0	2	1	2
Yes	62	3	4	3	12	4	7	9	11	3	6
Didn't answer	12	0	3	0	0	1	1	2	3	1	1
Total	91	5	7	4	18	6	9	12	16	5	9

TABLE 6 | Will 'AI' be a transformational force? Age analysis.

Level of agreement	Total ECRs	N/A	Youngest 25–29	Y/most 30–34	Median 34–37	O/most 37–39	Oldest 39–51
Don't know	6 (7%)	0	0	1	1	0	4
No	11 (12%)	0	4	4	0	2	1
Yes	62 (68%)	1	13	12	13	13	10
Didn't answer	12 (13%)		1	1	4	3	3
Total	91 (100%)	1	18	18	18	18	18

In terms of gender, there was not much in it, but males were slightly more positive about a transformation (33/40) compared to females (29/39).

What follows first are some quotes selected from the majority of ECRs believing AI was going to prove to be a transformative force, which will speed up and simplify research:

> I think it will be. It will be a tremendously useful tool for research because it can process much of the information quickly, and report results that may be useful. For example, to know the state of the art on a specific topic. [Spanish chemical scientist].

AI is totally going to shake things up in academia and scientific publishing! It is going to make research easier by helping with tasks like literature reviews and data analysis, which means more time to do quality research. Plus, it can even write manuscripts for us! But there are downsides too, like too much dependence, bias in AI, the data that they are trained on and worries about ethics and privacy. Still, if we use it right, AI could be a game changer, speeding up discoveries and making research better for everyone. [Malaysian life scientist].

AI will be transformative, especially in terms of speeding up the compilation and aggregation of scientific information. I think AI will be important in identifying results and other important elements often "buried" in the middle of articles that are not normally picked up. I think AI will help improve the clarity of writing and describing scientific texts. [Portuguese life scientist].

> A few quotes from those believing it would not be a transformative force and they tend to be less fulsome and starker:

This from a sceptical Polish life scientist: No, I don't think so yet, AI can, at most, help search texts for a given query.

And a soft social scientist from China: I do not think AI has a significant role to play in the scholarly communication system.

6.3 | 4b AI and Inequalities

The question was: *Will the use of 'AI' exacerbate existing disparities and inequalities, with people with access to AI-based tools speeding up their publication processes?*

The large majority (57; 63%) thought it would create inequalities, with just 14 (17%) saying it would not. So, there appear to be few doubts here. All the Portuguese said Yes (10/10) and it was the Chinese who were most likely to say No (5/21). A&H ECRs were less likely to agree (11/23), so obviously, there were fewer worries in a field which is quite far away from the action and this is possibly down to the fear of the unknown. No real age or gender differences were found. A flavour of the yes responses follows with these two comments:

AI might make the gap even wider. Those who've got AI tools can do their work faster. So, if you don't have access to that technology, you're left behind, struggling to keep up. That's why the government's all about pushing AI. They want to bridge that gap in society. If everyone's got access to these AI tools, then maybe we will notsee such big differences in how fast people can get things done [Malaysian hard social scientist].

Yeah, that's a real possibility. Researchers and rich universities with fancy setups might get to learn and access AI tools more easily. This could create gaps in who gets to speed up their publication using AI. Some universities like in Singapore set their staff up with AI tools, but not all of them. Using AI well requires some specialised know-how, and not everyone has the same opportunity at quality training. So, it's like the haves and have-nots in the AI world. [Malaysian mathematical scientist].

6.4 | Around the Countries Review[6]

Malaysian ECRs are unanimous in envisioning a transformed scholarly communications system that uses advanced digital technologies to make publishing more efficient, accessible, and collaborative, while maintaining ethical standards. All ECRs expect traditional journals to retain a central role, with only high-quality journals likely to sustain long-term relevance. A few speculate that traditional journals may eventually give way to alternative platforms such as pre-print servers, yet they acknowledge this shift has yet to take hold, as Malaysian universities continue to prioritise traditional publications for KPI metrics. They highlight the potential of AI tools to improve the detection of misconduct and support editors in making informed decisions. Concerns about disparities in AI access and expertise within academia are prevalent, as most ECRs acknowledge that they depend on free AI tools, while researchers at wealthier institutions or research groups—who can afford subscription-based advanced tools—can expedite their research processes. Overall, ECRs view libraries as crucial actors, ensuring the responsible

and ethical use of AI while keeping academic communities informed about the evolving AI landscape.

There is no consensus among Polish ECRs as to whether there will be a transformation of the scholarly communication system. On the one hand, junior researchers accept an increasing impact of technology on their daily scientific and didactic activities, while on the other hand they show an attachment to traditional tools, such as journals and monographs. This is especially the case with A&H researchers. In general, they are positive about open science. Regarding the impact of AI on future scholarly communication, researchers are convinced that such an impact will be significant, although it is still too early to predict how significant. They raise concerns about the growth of low-quality AI-generated content, but also have hopes it will help them in their daily routines. However, the biggest factor concerning the transformations of scholarly communication concerns the Polish universities' evaluation system, which is under review by the Government. They struggle to meet the demands placed on them by universities. The requirements of the current system are primarily for publication in internationally recognised journals, but also for participation in grants funded by external institutions, both of which are difficult to attain.

Portuguese ECRs do not present a structured reflection of what a transformed scholarly communications system should look like. However, some believe that an AI transformation is already in place, meaning we are already riding the technological wave. Others exhibit doubts about AI's capacity to transform the system in a positive way, because more technology means less human involvement, leading to a growth in standardised processes. It is also seen that AI could make it easier for publications to reach their target audience. The advantage of a faster scientific production (but, perhaps, lower overall quality) and improved access to scientific content (but less comprehensive) places AI as a neutral transformative force, especially in terms of speeding up the compilation and aggregation of scientific information. The dark side is thought to be the loss of the 'relational' and organic aspect of research. Inequalities are a clear danger stemming from AI, and ECRs understand that science itself is a field of unbalanced forces.

ECRs want a system built that communicates preferentially with society, with political decision-makers, industry, civil society and citizens, instead of only communicating inwards, in a closed, monotonous, and anti-innovation loop. Libraries are thought in principle to be necessary and fundamental, but ECRs acknowledge the need for a deep transformation.

Spanish researchers consider that for a real change to the communication system to take place there would first have to be a change in the terms of their job, which is widely seen as too demanding and competitive and makes it difficult to change their ways of working. Also, they believe that the much heralded new open and collaborative system is only possible if the evaluation of researchers changes and considers more than citations and includes altmetrics, publication in open platforms, repositories and so on. They talk about an ideal new system, which is less formal that gives less importance to publications and more to conferences and outreach. As they are pessimistic about big changes coming about, most think that journals will still have a central role. They are less supportive of libraries; they think that libraries must evolve to survive. They are not sure that AI will be a transformative force, but they think that it will bring changes and will increase inequalities.

7 | Conclusions

We have already made the point that ECRs are in the perfect position to act as scholarly communications soothsayers, so what they have told us about AI in more than 600 h of interviewing bears listening to and acting upon. Important, as our literature review shows, we know very little about them and AI (But lots about everyone else!). This paper then is special in that we have been able to get together nearly a hundred ECRs from around the world from all disciplines to tell us what they freely think.

What we found out is that three-quarters of the ECRs who responded envisaged the transformational change of scholarly communications. Not surprisingly, given the relative novelty of AI, it was less clear what that transformation would be, with 20 visions proffered, with an improved, more efficient scholarly system topping the list; followed by a more open system and a system with better peer review. But clearly, journals were thought to be part of any future scenario, with four out of five ECRs thinking they will have a central role to play for a very long time. This was thought to be the case irrespective of country, subject, and gender. The main reason being they provide a trusted and established form of communication. All this, despite fears they have about a dumbing down because of AI ghostwriters, fears of a growing predatory population driven by APCs, and general worries about the quality of peer review. Libraries, on the other hand, were not widely seen to have such a bright future, with around one-quarter of ECRs thinking they either had no long-term future or a declining one, and a majority thinking they would stay very much as they are today. The Malaysians, however, were the outliers foreseeing an expanding role for libraries, and that largely thanks to AI.

Not unexpectedly, the driving force behind transformational change was thought to be AI, with more than two-thirds of all ECRs believing this—ten points higher than that, leaving aside those who did not answer the question. This leads us to believe that while ECRs were not entirely sure of what aspects of scholarly communication would change because of AI, they were nevertheless sure that change there will be. Those from the mathematical sciences and medical sciences were most likely to think AI would be transformative. And nearly two-thirds thought that AI would create inequalities.

Returning to the question we posed right at the outset, *Where will AI take scholarly communication?* Well, the answer is clear: quite a long way and to all the nooks and crannies of the scholarly communications system. And, the specific details of which can be found in their voluminous and informed comments that pack this paper. The 'voices' have it.

Note, this was a preliminary study, part of the long-running, longitudinal Harbingers project, attempting to inform and plan for a major study, which would have a larger and more representative cohort of ECRs. Our findings should be treated with caution, more as informed observations, filling a knowledge vacuum.

Author Contributions

David Nicholas provided the planning, conducted much of the analysis and wrote much of the paper and edited it. Eti Herman conducted the literature review and helped structure the paper. David Clark provided the data analysis and technical support. Marzena Swigon undertook the A&H element of the study. Blanca Rodríguez-Bravo and Abdullah Abrizah provided the proofreading. Jorge Revez some important insights. The rest of the authors undertook their country analyses and provided general feedback.

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Consent

Participants who freely opted to take part in the interviews were asked to provide their names and contact details for follow-up questions regarding the accuracy of the interview transcripts, but access to all personal data was restricted to the investigating team and was removed before the analysis of the results.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

[1] https://ciber-research.com/harbingers-3/index.html.

[2] https://ciber-research.com/download/ECRs_Harbingers%203_Pilot%20Interview_schedule_1610DN.pdf.

[3] While this was true for Harbingers-1 and Harbingers-2, more ECRs in their forties are in Harbingers-3 because our cohort aged.

[4] https://ciber-research.uk/download/ECRs_Harbingers%203_Pilot%20Interview_schedule_1610DN.pdf.

[5] https://ciber-research.uk/download/Harbingers3-P1-CodeSheet-djc20240112.pdf.

[6] Data from China absent.

References

Andersen, J. P., L. Degn, R. Fishberg, et al. 2024. "Generative Artificial Intelligence (GenAI) in the Research Process–A Survey of Researchers' Practices and Perceptions." *SocArxiv*.

Bergstrom, T., and D. Ruediger. 2024. "A Third Transformation? Generative AI and Scholarly Publishing." *Ithaka S+R*.

Dwivedi, Y. K., N. Kshetri, L. Hughes, et al. 2023. "Opinion Paper: "So What if ChatGPT Wrote It?" Multidisciplinary Perspectives on Opportunities, Challenges and Implications of Generative Conversational AI for Research, Practice and Policy." *International Journal of Information Management* 71: 1026242. https://doi.org/10.1016/j.ijinfomgt.2023.102642.

ERC—European Research Council. 2023. "Foresight: Use and Impact of Artificial Intelligence in the Scientific Process." https://erc.europa.eu/sites/default/files/2023-12/AI_in_science.pdf.

Herman, E., D. Nicholas, A. Abrizah, et al. 2024. "The Impact of AI on the Post-Pandemic Generation of Early Career Researchers: What We Know or Can Predict From the Published Literature." *Learned Publishing* 37, no. 4: e1623. https://doi.org/10.1002/leap.1623.

Hosseini, M., C. A. Gao, D. M. Liebovitz, et al. 2023. "An Exploratory Survey About Using ChatGPT in Education, Healthcare, and Research." *PLoS One* 18, no. 10: e0292216. https://doi.org/10.1371/journal.pone.0292216.

Liu, J., and H. V. Jagadish. 2024. "Institutional Efforts to Help Academic Researchers Implement Generative AI in Research." *Harvard Data Science Review*. https://doi.org/10.1162/99608f92.2c8e7e812024.

Nicholas, D., A. Abrizah, J. Revez, et al. 2024. "Are Early Career Researchers Feeling the Consequences of the COVID Pandemic?" *Learned Publishing* 37, no. 4: e1629. https://doi.org/10.1002/leap.1629.

Nicholas, D., E. Herman, C. Boukacem-Zeghmouri, et al. 2023. "Transforming Scholarly Communications: The Part Played by the Pandemic and the Contribution of Early Career Researchers." *Learned Publishing* 36, no. 4: 492–505. https://doi.org/10.1002/leap.1576.

Nicholas, D., E. Herman, C. Boukacem-Zeghmouri, et al. 2022. "Early Career Researchers in the Pandemic-Fashioned 'New Scholarly Normality': A First Look Into the Big Changes and Long-Lasting Impacts." *Profesional de la Información* 31, no. 4: e310418. https://doi.org/10.3145/epi.2022.jul.18.

Nicholas, D., E. Herman, D. Clark, et al. 2023. "The Impact of the Pandemic on Early Career Researchers' Work-Life and Scholarly Communications: A Quantitative Aerial Analysis." *Learned Publishing* 36, no. 2: 128–140. https://doi.org/10.1002/leap.1541.

Nicholas, D., M. Świgoń, D. Clark, et al. 2024. "The Impact of Generative AI on the Scholarly Communications of Early Career Researchers: An International, Multi-Disciplinary Study." *Learned Publishing* 37, no. 4: e1628. https://doi.org/10.1002/leap.1628.

Nicholas, D., A. Watkinson, C. Boukacem-Zeghmouri, et al. 2019. "So, Are Early Career Researchers the Harbingers of Change?" *Learned Publishing* 32, no. 3: 237–247. https://doi.org/10.1002/leap.1232.

Nicholas, D., A. Watkinson, C. Boukacem-Zeghmouri, et al. 2017. "Early Career Researchers: Scholarly Behaviour and the Prospect of Change." *Learned Publishing* 30, no. 2: 157–166. https://doi.org/10.1002/leap.1098.

Nordling, L. 2023. "How ChatGPT Is Transforming the Postdoc Experience." *Nature* 622: 655–657. https://doi.org/10.1038/d41586-023-03235-8.

Owens, B. 2023. "How Nature Readers Are Using ChatGPT." *Nature* 615, no. 7950: 20. https://doi.org/10.1038/d41586-023-00500-8.

Praveen, S. V., and V. Vajrobol. 2023. "Understanding the Perceptions of Healthcare Researchers Regarding ChatGPT: A Study Based on Bidirectional Encoder Representation From Transformers (BERT) Sentiment Analysis and Topic Modeling." *Annals of Biomedical Engineering* 51: 1654–1656. https://doi.org/10.1007/s10439-023-03222-0.

Ruediger, D., C. McCracken, and M. Skinner. 2024. "Adoption of Generative AI by Academic Biomedical Researchers." *Ithaka S+R*. https://doi.org/10.18665/sr.321415.

Susarla, A., R. Gopal, J. B. Thatcher, and S. Sarker. 2023. "The Janus Effect of Generative AI: Charting the Path for Responsible Conduct of Scholarly Activities in Information Systems." *Information Systems Research* 34, no. 2: 399–408. https://doi.org/10.1287/isre.2023.ed.v34.n2.

Van Noorden, R., and J. M. Perkel. 2023. "AI and Science: What 1,600 Researchers Think." *Nature* 621, no. 7980: 672–675. https://doi.org/10.1038/d41586-023-02980-0.