

Review Article

Challenges for Early Career Researchers in Academic Research

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A B S T R A C T

The academic community's early career researchers (ECRs) are a distinct and significant group that can spark systemic change in research culture and practice. Yet, because of institutional limitations as well as individual and professional restrictions, they do, in certain ways, occupy a niche that is deliberately inferior. These could put children at risk for abuse and lead to tension and worry. More credit fairness is required in research and publishing since ECRs' efforts could unjustly enhance the reputations of their mentors and/ or supervisors. This is due to the possibility that they will come across a strict publication and research environment where the status quo is established fundamentally. Supervisors play a crucial role in assisting ECRs in navigating the unpredictable academic environment and helping them adjust to it. Additionally, ECRs must be aware of the rapidly changing nature of research and publishing, the value of reproducibility and open science, and the dangers of predatory publishing and spam. ECRs will benefit greatly from having an emphasis on research and publishing integrity, as well as flexibility, sensitivity, inventiveness, adaptability, courage, and strong observational abilities.

This opinion piece offers a comprehensive understanding of the challenges that ECRs have when conducting research and publishing. Additionally, this paper looks for unrelated elements that could increase the professional vulnerability of ECRs. It could be challenging for ECRs to carve out a distinctive career path that values creativity and fulfils their aspirations, whether personal or professional.

Keywords: Anxiety, Career Development, Citations, Integrity, Metrics, Postdoctoral Research, Rewards, Seniority, Status, Stress Management

Introduction

The landscape of academic research has undergone significant shifts in recent decades, especially for Early Career Researchers (ECRs). This group comprises individuals engaged in academic research at a sub-tenure level, irrespective of their years of experience. While some changes have been beneficial, the challenges and

transformations faced by ECRs in today's dynamic scientific environment are noteworthy.

Defining ECRs within approximately the first 10 years post earning their terminal degrees, this group encompasses postgraduate students, research fellows, and junior faculty members. Each segment faces unique obstacles that can impact their research progress and career trajectories.

Postgraduate students and research fellows often encounter delays and setbacks beyond their control, leading to potential research blunders. Junior faculty, in their early career stages, are tasked with establishing independent research agendas amidst hiring freezes, pipeline constraints, and limited collaborative opportunities within their departments.

While mid-career and senior investigators share some of these challenges, ECRs are particularly susceptible due to their shorter track record of independent publications. Straddling the line between innovation and ambition, ECRs often grapple with reviewer demands that aim to refine their work. This tug-of-war can refine the scientific approach or result in undue stress on these early career researchers.

Promoting a mindful approach to career development is crucial. Discussions around mental health resources must be integral to these conversations, as the pursuit of a tenure-track faculty position can lead to burnout. Mentorship and research societies play a vital role in guiding ECRs toward suitable research paths. The transition of ECRs into non-academic careers, including the private sector, is on the rise, highlighting the need for robust support systems and alternative career options.¹

Importance of Research Improvements for Early Career Researchers

While the journey to a research career is rewarding, ECRs face a challenging scientific landscape that demands competing priorities. Research improvements for ECRs are imperative for several reasons:

1. **Future Leadership:** ECRs represent the future leaders of the research community and should actively contribute to shaping its trajectory.
2. **Majority Workforce:** ECRs constitute a significant portion of the scientific workforce, warranting their active involvement in driving meaningful change in collaboration with established researchers.
3. **Time and Energy:** ECRs invest substantial time and effort in research, often surpassing that of senior scientists.
4. **Idealism and Optimism:** ECRs bring fresh and unchallenged idealism to the scientific enterprise, inspiring reform efforts.
5. **Openness to Innovation:** ECRs are more receptive to new solutions, which can challenge conventional approaches and improve existing systems.
6. **Diversity and Perspectives:** ECRs represent a diverse group that brings varied perspectives and creative solutions to research challenges, thereby enhancing inclusivity and innovation.

7. **Technical Prowess:** ECRs possess technical skills acquired through hands-on experience, enabling them to implement cutting-edge methodologies.

In this evolving landscape, nurturing and empowering ECRs is crucial to fostering their growth as future leaders and contributing to the advancement of research.²

Guidelines for Early Career Researchers

Before embarking on a new initiative, ECRs should approach their research with the same methodical consideration used in planning a research study. This approach not only conserves time but also aids in expanding one's professional network through the identification of like-minded individuals and potential collaborators. Structured dialogues should be orchestrated to systematically unearth solutions and garner support from allies. ECRs might also chance upon relevant materials or ongoing initiatives that align with their objectives, which they can either participate in or bolster. It is of paramount importance for ECRs to delve into the reasons behind past endeavours' shortcomings, as this scrutiny equips them to predict and surmount obstacles, forging a path to success where others faltered. Establishing a novel initiative demands an investment of time and resources; hence, ECRs should remain attuned to opportunities where they can contribute to existing impactful undertakings. Involvement in established committees or groups could expedite the achievement of outcomes.

Commence with Attainable Objectives

Though ECRs might possess a grand vision coupled with a multitude of inventive concepts, the pursuit of multiple notions in parallel frequently culminates in discontent, a sense of being inundated, and ultimately, a lack of success. Initiating the journey with gradual and feasible goals empowers the team to fine-tune their methodology and resources, concurrently accumulating expertise and generating forward thrust.

As the chosen approach begins to yield positive results, the team can leverage their achievements to extend their reach into novel communities or incorporate fresh objectives.³

Promote Equity, Diversity, and Inclusion

The pivotal endeavour of supplanting biased, prejudiced, and exclusive systems and behaviours with all-encompassing alternatives cannot be overstated. Initiatives should proactively reach out to individuals hailing from minoritised and marginalised groups, dismantle impediments hindering their participation and potential for success, and cultivate an understanding of the ramifications of both implicit and explicit biases. It is our fervent encouragement that all scientists embrace and implement approaches that are both inclusive and equitable, fostering the dissemination

of these principles throughout their initiatives and research milieus. Given the evolving nature of equity and inclusion imperatives and best practices, a continuous commitment to lifelong learning is imperative. Initiatives should fabricate and share resources in a manner that is universally inclusive and accessible. Techniques encompass employing inclusive language, furnishing closed captioning for recorded content, and providing materials in diverse languages.⁴

Foster a Constructive and Inclusive Team Atmosphere

The establishment of a code of conduct can serve as a guiding framework to outline anticipated standards for interactions and communication. It is paramount to designate a capable moderator who can facilitate well-rounded discussions, spotlight and elevate voices from marginalised backgrounds and openly elucidate the rationale underpinning team resolutions. Cultivating a sense of camaraderie and sociability through interpersonal relationships is pivotal for shaping a harmonious team dynamic. In the delegation of responsibilities, consensus should be reached regarding roles that align with individual strengths and areas of interest.

Anticipate and Address Concerns Effectively

Gain insight into the organisational change process and pre-empt potential objections. Foster support by developing well-crafted responses to common concerns. Engage directly with target audiences to comprehensively grasp challenges, interests, and potential resolutions. Construct pragmatic and compelling solutions, refining them iteratively based on the feedback received.

Persevere with Determination

Acknowledge that effecting systemic change is a gradual endeavour. Engage in conversations with individuals representing various career stages and different facets of the organisation. It's important to remain undeterred by instances where some individuals may not exhibit immediate interest. Adapt the team's approach to navigate obstacles. The journey to a goal often offers numerous avenues; the key is to identify one successful path.

Disseminate and Amplify

Prioritise the identification of your intended audience before generating materials and formulate a targeted communication strategy tailored to them. Tailor your approach when presenting your initiative to decision-makers or potential collaborators, as they may necessitate a distinct communication strategy. Opt for dissemination channels that align with your audience's preferences (e.g., Open Science Framework for documents, GitHub for code, and social media for raising awareness). Address potential dissemination barriers like language constraints, access to materials, and outreach beyond the team's networks.

Extend your influence by adapting materials to cater to other groups. Collaborative efforts can amplify the impact by aligning with complementary groups that share similar objectives.

Ensure Long-Term Viability

Given the transient nature of Early Career Researchers (ECRs), meticulous consideration must be given to how the initiative will endure beyond the tenure of its organisers. The quest for systemic transformation demands steadfast dedication over time. It may be imperative for the team to approach challenges from multiple vantage points or forge collaborations with other groups that offer divergent problem-solving approaches. Should the need diminish, consider phasing out the initiative.

Embarking on the Research Journey

Typically, the research voyage commences after the successful completion of an entrance test and the presentation of a proposal, contingent upon approval from the research committee. This journey encompasses heightened awareness of subject-related aspects as part of the PhD curriculum, including a comprehensive evaluation of Research Methodology. The student then embarks on coursework, commencing with title approval presentations, followed by the exploration of literature, formulation of hypotheses, establishment of objectives, analysis of Research Methodology, and the eventual culmination of findings, culminating in completion.⁵

Challenges of Early Career Researchers

Literature Review Challenges

Accessing essential literature for the review process proves to be a significant hurdle. Scarce availability of required resources is a prominent obstacle during literature reviews. Additionally, difficulties arise from limited internet access, unfamiliarity with effective article retrieval methods from journals and databases, and the time-consuming nature of seeking information from traditional libraries. These libraries, particularly those situated away from major urban centres, often lack updated government publications. The timely availability of published data is also sporadic. The usage of paid e-journals and research papers is limited due to their cost. The skill of identifying research problems is crucial and necessitates a profound understanding of recent advancements in the field, along with the capacity to synthesise various works to discern gaps. Framing a problem appropriately is a pivotal aspect of research, frequently occupying a substantial portion of a PhD candidate's efforts. This skill matures with the development of the ability to assess results and issues subjectively. Moreover, this ability is vital within the research community, where one is often called upon to critique others' work.⁶⁻¹⁰

Title Approval and Problem Synthesis

Title approval hinges on the synthesis of the problem, clearly highlighting existing research gaps and confirming the feasibility of investigating the subject. During this stage, identifying key problem areas involves determining the gaps in knowledge and formulating research questions that yield differentiable and testable hypotheses. Problem selection should gravitate towards subjects that can be tested and implemented, transcending abstract concepts. The brainstorming process should encompass diverse perspectives, including social and environmental aspects.¹¹

Formulating Objectives and Hypotheses

Behind every research endeavour lies a novel idea, a hypothesis that forms the bedrock of the research. However, research entails more than ideation; it entails meticulous development within established scientific research paradigms, thereby demonstrating the idea's intrinsic value. Navigating research challenges, actively engaging in research, and studying the work of fellow researchers help in honing this ability.

Designing a Comprehensive Questionnaire

The creation of a coherent questionnaire can prove perplexing. Conducting a pilot survey is pivotal for refining the questionnaire based on constructive feedback and enhancing its efficacy. The questionnaire design should intricately align with research objectives and problem statements. Assessing the questionnaire's reliability constitutes a critical aspect, involving rigorous testing to ascertain if questions exhibit consistency and predictability through statistical analysis, such as the "r test".¹²

Data Collection Challenges

Navigating systems like pilot surveys, tools, and techniques for data collection can be daunting. Challenges include obtaining superficial or incomplete data, encountering difficulties in information retrieval, and grappling with non-responsive participants. In certain sectors, such as industries, data may be elusive due to unwillingness to disclose proprietary information. Ensuring that respondents comprehend the issues being explored is crucial. While aspirations might be lofty, the practicality of data collection should not be underestimated. Half of the respondents acknowledge that data collection poses significant challenges. While data acquisition is possible, hurdles may emerge during the process of defining issues and converting them into testable hypotheses.

Research Methodology and Guidance

Determining an appropriate research methodology presents difficulties, particularly concerning population and sample size. A lack of comprehensive scientific training in research methodologies compounds the issue. The scenario often

resembles a situation where individuals lacking sufficient methodological expertise guide others, resulting in a cycle of inadequate mentorship. Copying methodologies from similar studies is a common practice due to the absence of structured guidance or comprehensive guidelines.¹³

Proposed Solutions for Challenges

Adequate training encompassing all research phases is crucial, with an initial emphasis on proficiency in statistical software packages. Assessing researchers' aptitude for research is essential; current practices such as the NET exam test this aptitude. Institutes could adopt testing mechanisms to ensure candidates possess the requisite research acumen. Developing effective note-taking skills and revisiting research methodology subjects are valuable. A portion of applicants face disqualification during initial screening for exams like NET, emphasising the need for motivation and support.

Research methodology and its place in education despite being a component of various undergraduate and postgraduate courses, there exists a lack of awareness concerning the significance of research and the rationale behind incorporating research methodology in curricula. This lack of understanding often translates into disdain for the subject, particularly when confronted with numerical aspects like biostatistics. Several Proposed Solutions for students and budding researchers, some of which are as follows:^{14,15}

Scientific Training: The dearth of competent researchers versed in research methodologies is glaring. In numerous cases, there is a scenario akin to the blind leading the blind. Many research guides themselves lack comprehensive knowledge of various methodologies, inadvertently steering their students toward duplicating methodologies from prior studies.

Plagiarism and Data Duplication: Copying data from international or external studies is an unethical practice that tarnishes the integrity of research. While re-evaluating previous studies with added insights is encouraged, verbatim replication or repetition undermines the essence of original research. Respect for others' hard work is essential, and this act perpetuates a lack of awareness in research methodology.

Manipulation of Data: Researchers sometimes engage in data manipulation, altering sample sizes or skewing results to align with their expectations due to a lack of confidence in the study's outcome. Relying solely on theoretical knowledge can lead to skewed interpretations. Some researchers abstain from engaging with subjects, undermining the authenticity of their research.

Challenges in Literature Access: Literature review often encounters hurdles like limited access to required resources. Internet accessibility issues and unfamiliarity with effective search methods compound the problem. Traditional libraries' limitations in acquiring up-to-date government publications, along with the periodic unavailability of published data, further exacerbate the issue.

Shifting Perceptions of Research: Interactions with senior students who have faced research challenges can alter the outlook of aspiring researchers. Research can be approached with varying attitudes, either as an exploratory endeavour or as a perfunctory obligation.

Lack of Confidence: Multiple factors, including those mentioned above, contribute to a lack of confidence among researchers. Apprehensions about study outcomes and presenting findings can hinder progress. Researchers should have the courage to disseminate study results, understanding that limitations are acknowledged and respected within the research community.

Permission Restrictions Access: restrictions imposed by institutions such as hospitals and businesses hinder research activities. Security concerns and data confidentiality considerations often deter external involvement. Obtaining permissions may involve substantial fees, which can impede researchers' progress.

Research as a Curriculum Formality: Many students view research as a mere requirement to fulfil their course obligations. A desire for shortcuts prevails, but it is crucial to recognise that diligent research contributes to the body of knowledge and serves as a reference for future researchers.

Publishing Expenses: Publishing completed research can incur significant costs, particularly for printing, binding, and publication in international journals or conferences. These financial burdens may limit students' ability to disseminate their findings.

Sponsorship Limitations: Obtaining sponsorship may prove challenging due to various reasons, including hesitation to engage with sponsors, inability to convince them, or a lack of confidence in the researcher's capabilities.^{16,17}

Conclusion

Embarking on the journey of research and seeing it through to completion is a meticulous and intricate endeavour, marked by a series of deliberate steps undertaken by the researcher. It initiates with the identification of a research-worthy problem and unfolds into a rigorous pursuit, involving comprehensive reading, discernment of gaps in the subject matter, and steadfast progression towards addressing them. The path is far from straightforward; it demands a nuanced understanding of challenges from multiple dimensions. Research, as a driving force

behind societal advancement, permeates every facet of human existence. Despite this, the concerted efforts to address research-related issues have been limited in their institutionalised nature. Entities such as UGC and AICTE have made commendable contributions to fostering research and bridging the gap between theory and practical applications, thereby enhancing the quality of education. However, certain obstacles persist in the promotion of high-quality research.

Predominantly, impediments arise from restricted access to essential resources, compounded by a lack of familiarity with effective search methodologies, particularly when dealing with physical libraries. These challenges are compounded when these libraries lack updated government publications. Furthermore, timely access to published data is inconsistent, with e-journal research papers often inaccessible due to subscription fees.

The skill of identifying research problems stands as a cornerstone of effective research practice. It necessitates a profound understanding of recent developments within the field and the ability to assemble various components into a coherent whole. Formulating a problem appropriately is tantamount to laying the foundation for fruitful research. Whether one is a current student or a doctoral graduate, engaging in research is an integral aspect of becoming a scholar-practitioner with the capacity to catalyse social change.

As the realm of research in India confronts numerous challenges, the key to advancing lies in surmounting these hurdles. The pursuit of superior research, impactful research papers, and ultimately, the cultivation of exceptional researchers hinges on our ability to address and overcome these issues effectively. Only through such endeavours can we pave the way for enhanced research outcomes and a brighter future for research in our country.

Conflict of Interest: None

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