

Understanding How Early-Stage Researchers Perceive External Research Feedback

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1. INTRODUCTION

Feedback on research projects can be important for learning research skills, especially for Early-Stage Researchers (ESRs), who are typically PhD students [Wang and Li 2011]. However, most ESRs get limited feedback from a small circle of advisors, reviewers and peers [Zhang et al. 2017; Gafney 2005]. This is a growing challenge as the number of research students is increasing, while dedicated on-demand feedback is hardly scalable – advisors have limited time and resources to provide in-depth feedback to multiple ESRs [Gafney 2005; Zhang et al. 2017].

Collective intelligence has shown its emerging capability in scaling feedback exchange in various contexts [Jiang et al. 2018; Zhang et al. 2017; Lebeuf et al. 2017; Campbell et al. 2016; Evans et al. 2017; Hui et al. 2019]. For example, researchers described how creative designers and artists seek feedback through online creative communities [Campbell et al. 2016; Evans et al. 2017]; how students get feedback from experts in industry [Silva et al. 2020; Trainer et al. 2017; Harburg et al. 2018; Chen et al. 2017]; and how online forums, such as Q&A platforms, afford on-demand feedback [Ford et al. 2017; Abdalkareem et al. 2017; Choi et al. 2014]. This represents a great opportunity for research community, a sector that is inherently drawing on high levels of good-will and volunteer feedback on research artefacts.

Feedback on research projects and activities from large external communities has not yet been properly leveraged and catered for the specific needs of ESRs [Anonymous 2021]. Online crowds are helping some citizen science projects gathering and processing research data [Law et al. 2017; Lintott et al. 2008]. Online research communities such as ResearchGate are emerging but are generally helpful for inquiries on specific problems rather than in-depth research feedback [Anonymous 2021; Goodwin et al. 2014]. More specifically, knowledge about the needs of ESRs with external research feedback and the challenges of leveraging collective intelligence in scaling research feedback exchange are still under explored.

In this paper, we report on an online survey to answer two questions: (i) What are the types of external feedback that are in stongest need and perceived to be most useful by ESRs? and (ii) What are the top challenges and barriers in getting and adopting external feedback on research for ESRs?

2. AN ONLINE SURVEY STUDY

We designed and conducted a web-based survey¹ delivered via Qualtrics. The design of the survey was informed by literature on feedback exchange in online communities [Campbell et al. 2016; Chen et al. 2017; Choi et al. 2014; Evans et al. 2017; Anonymous 2021], which were used as the foundation to derive general themes regarding ESR needs and challenges in leveraging feedback from online research communities. In this survey, we build on those insights to understand more specifically the

¹The full survey is available at <https://bit.ly/3bOkwzX>

needs and challenges regarding requesting and adopting external research feedback, as experienced by ESRs at a large scale. The survey was distributed through various channels including mailing lists, snowball sampling, online discussion groups and social media platforms. Participation was voluntary.

After providing their informed consent and their demographic information, respondents provided feedback on the needs for external feedback. The needs were organized around need for feedback on research questions (N1), plans for study design (N2), conducting experiments and ethics (N3), analyzing data and describing results (N4), and research artefacts such as paper drafts and presentations (N5). To prioritize their needs, we asked respondents two questions: (i) *how often they wished to get the type of external feedback* (selecting from “never, rarely, sometimes, often and always”), and (ii) *how useful they perceive each type of external feedback* (selecting from “not at all, slightly, moderately, very and extremely”). To prioritize the challenges that ESRs faced with external feedback on their research, we asked respondents how much they agree with the challenges *C1-C10* as in Table I, selecting from strongly disagree, somewhat disagree, neutral, somewhat agree and strongly agree. We further inquired open questions about: (i) any additional needs and challenges they faced; and (ii) positive and negative experience with external research feedback.

Table I. : Challenges Faced by ESRs with External Feedback on Their Research

Requesting Feedback	C1	I feel suspicious of online helpers' intentions to give feedback.
	C2	I am afraid to expose weakness or pose as incompetent with a (public available) profile.
	C3	I may feel disappointed and frustrated when getting no responses after asking for feedback and thus drawing me back from asking for further feedback.
	C4	I am afraid that sharing pieces of my research online before publishing might introduce confidentiality / privacy / IP conflict problems, or compromise my research.
Interacting with an extended network	C5	I might not get an instant reply while discussing on my research artifacts. Thus the conversation on the feedback is not productive and fruitful.
	C6	The mostly text-based interaction in online communities pose limitations in properly explaining my inquiries and understanding helpers' feedback.
Adopting Feedback	C7	The ambiguity of the helpers' authority and qualification to answer my inquiry.
	C8	Quality of feedback not up to the standard for scientific use (e.g., no references given).
	C9	Online help failing to provide precise and complete answers to your research inquiries (e.g., no rationale).
	C10	Feedback not timely for my deadlines.

3. FINDINGS

We collected 119 responses from a diverse set of respondents² in terms of sex (female 49.2%, male 46%, NA 4.1%), geographic location (Oceania 49.2%, Europe 21.3%, Asia 13.9%, Latin America 8.2%, Africa 6.6%, Canada and USA 0.8%) and research experience (years since starting PhD, 1- 5+ years). In terms of field of study, they were generally grouped into Science, Technology, Engineering and Mathematics (STEM) (58%) and Humanities, Arts and Social Science (HASS) & Interdisciplinary (42%). The analysis below focuses on those 93 respondents, who reported needing external feedback (78%).

The Needs of ESRs for External Feedback. To illustrate the relationship between how strong the need is (*Frequency*) and the how useful they would consider addressing that need (*Impact*), we draw an impact matrix for respondents from HASS researchers, STEM researchers and all respondents. The resulting matrix, as captured in Figure 1A, highlights the overall needs and the perceived usefulness for external feedback on research methods (N4) and external feedback on research paper drafts and

²Full demographic information at <https://bit.ly/2MVgPP8>

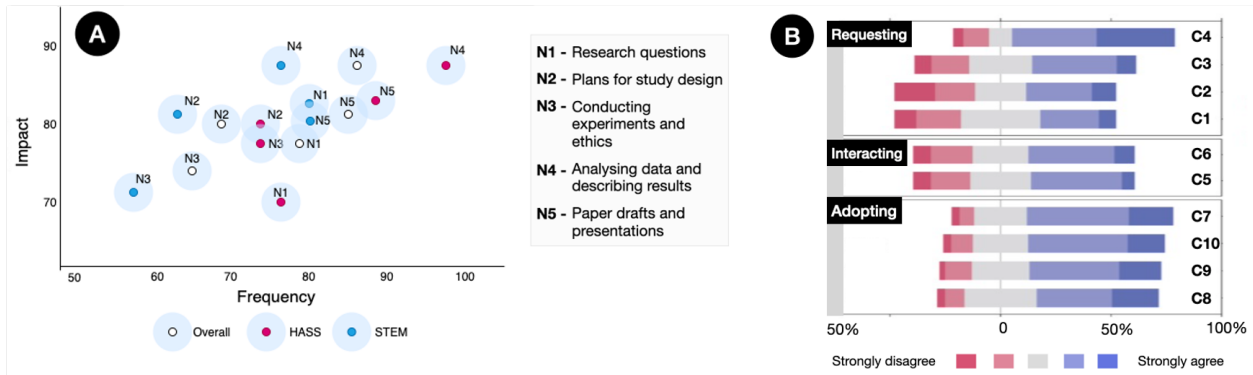


Fig. 1: (A) The probability and impact matrix. (B) Frequency of responses to Likert questions probing on ESRs challenges.

conference presentations (N5). No matter the discipline backgrounds, either HASS or STEM, N4 is perceived as the most useful among all types of external feedback. STEM students need more external feedback in framing research questions (N1), while HASS students need more external feedback on executing and synthesising research research (N3 & N4). Comparing with HASS respondents, STEM respondents reported experiencing the need for external feedback to lesser extent, but considering the feedback as more important.

The Challenges ESRs Face When Seeking External Feedback The survey revealed that the challenges are widespread and faced by the majority of ESRs, even when stratifying by location, discipline and gender. Figure 1B summarised the responses regarding ESRs’ attitudes towards the challenges with external research feedback. We note that the majority of respondents were afraid of sharing pieces of their research artefacts online before publishing (C4). Comparing with requesting feedback and interacting with helpers, more respondents agreed that they had challenges with adopting external feedback. In adopting feedback, respondents expressed higher concerns about the qualification of the helpers (C7), followed closely by the quality of the feedback not being up to the scientific standard (C8). Beyond indicating their agreement, 28 respondents provided open-ended feedback either elaborating on those challenges or describing other challenges they experienced. This led to the identification of two new challenges. The first challenge is about feeling confused by different viewpoints or balancing with difficulty the viewpoints. One respondent explained that “*There will be a lot of chances that the supervisors and others have quite a different world view and the PhD researcher will be like facing two different opposing forces*”. The second challenge is about unwaring of where or how to effectively ask for external feedback: “*Sometimes it is difficult to find the right person*”; “*one reason not to ask for help could be the effort it takes to prepare my questions in an understandable way*”.

4. CONCLUSION

This study identified the most recurring needs and challenges of ESRs with external research feedback. The need for external research feedback is experienced by the large majority of the respondents, especially feedback on research methods and paper drafts. They, however, faced with challenges to benefit most from the feedback, especially in sharing research artefacts before publishing and in concerning the qualification of helpers and the quality of external feedback. Our future research will leverage the findings of this study to design systems to scale research skills learning by supporting ESRs to request and adopt external research feedback.

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