Open research as an ally to teaching and scholarship-track academics

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Abstract

'Open research' broadly aims to enhance the openness, transparency, and robustness of research across disciplines. While existing efforts have largely focused on improving the quality of research outputs, we argue that certain open research tools can also offer strategic benefits for Teaching and Scholarship (T&S) academics who engage primarily in educational or pedagogical research. Given the challenges in conducting high-quality pedagogical research, the adoption of open research tools may support T&S academics, by increasing research visibility, informing and refining methodological decision-making, and enhancing the efficacy and impact of pedagogical research. In this paper, we outline three key open research tools that may strategically benefit T&S academics: (1) preprints, (2) registered reports, and (3) sharing open educational resources. For each tool, we provide an overview, discuss how T&S academics can integrate them to improve their practice, and offer illustrative case studies. This discussion draws on the conceptualisation of high-quality pedagogical research outlined by Evans et al. (2021). We end with a call to researchers to align open research efforts with pedagogical scholarship, which will, in turn, improve pedagogical practice.

Keywords: open research, scholarship, pedagogical research, teaching

Introduction

In the United Kingdom, 'Teaching & Scholarship' (T&S) track refers to academics whose primary focus is teaching and scholarship or pedagogical/educational research, as opposed to disciplinary research. This is sometimes referred to as 'Teaching and Learning' track or education-focused academics. The term T&S is used throughout this paper to refer to academics whose primary role is student education and pedagogical or educational research, as opposed to those with an emphasis on disciplinary research. In recent years, there has been a renewed focus in higher education on pedagogical research efforts, largely in response to the increasing prevalence and legitimacy of education-focused or T&S academic roles (Bull et al., 2024). However, scholars have also noted the need to ensure that attention is paid to the quality, rigour, and methodological clarity of pedagogical research (Evans et al., 2021). Running parallel to this, there have been broader discussions focusing on strengthening research across disciplines. 'Open research' refers to efforts to improve the openness, transparency, collegiality, and robustness of research (UKRI, 2024) and this involves developing, promoting, and adopting tools to advance open research principles.

While much focus has been on adopting such tools to improve research, we argue they are also strategically beneficial for T&S academics. That is, while open research tools may indeed improve research, we also

propose that they may be a strategically useful ally for T&S academics more personally, by improving their visibility and methodological decision-making and maximising the efficacy of pedagogical research efforts. This is important, given the ambiguity in T&S promotion pathways, limited mentorship, and challenges in high-quality pedagogical scholarship (Bull et al., 2024). Here, we outline three open research tools that may be strategically useful for T&S-track academics across disciplines. For each, we provide an overview, explain how T&S academics may engage with them to improve their Scholarship of Teaching and Learning (SoTL), and provide examples. This discussion is informed by Evans et al.'s (2021) notion of high-quality pedagogical research.

Preprints

A preprint is a version of a scientific paper, hosted on a dedicated server, that has not yet undergone peer-review (Moshontz et al., 2021). The sharing of preprints has a long history, especially in maths, physics, and computing science, where platforms like arXiv ("archive") have been used for decades. Researchers may also share papers that have undergone peer review and have been published in a journal. Such manuscripts are technically named post-prints, although preprint has become a broad synonymous term, and both must be free of any 'value-added' publisher formatting. Sharing work via a preprint server, unlike for example a personal blog, generates a DOI, making it part of the permanent academic record.

How preprints can help T&S academics

The process of peer review can be slow; for example, Nguyen et al. (2015) reported that the average time to receive reviews was 14 weeks. Preprints, therefore, enable researchers to rapidly disseminate their work in a more timely and responsive way, while it is being reviewed formally by journals. This is important, as Evans et al. (2021) argue that pedagogical research quality depends on its ability to influence practice, which can be time-sensitive. For example, Nordmann et al's 2020 paper '10 Simple Rules for Supporting a Temporary Online Pivot in Higher Education' was released as a preprint in April 2020, surpassing 1000 downloads in its first week. The peer-reviewed version was published on 1st October 2020, but sharing the preprint early allowed it to influence summer teaching planning and preparation. Beyond Covid, the rapid development of generative AI tools in higher education requires faster dissemination than traditional publishing allows.

Therefore, while formal peer review clearly remains important, posting research on preprint servers enables T&S academics to share work and track fast-evolving trends at a useful pace. At any individual level, sharing preprints also enables T&S academics to share work with funders, hiring committees, and colleagues more explicitly and impactfully than simply stating a paper is under review. This is crucial for early-career T&S academics or those transitioning to pedagogical research as preprints can benefit careers by showcasing expertise early, supporting networking and collaboration before publication is complete (or while peer review is ongoing).

In addition to increasing the speed of dissemination, preprints may also help increase the quality of the work prior to submitting it for publication. Preprints allow researchers to gain early feedback on their work and it can be particularly useful for T&S academics to have a feedback mechanism that can help the work generalise beyond a specific field, context, or institution. Indeed, Evans et al. (2021) argue that transferability and adaptability are crucial for pedagogical research to have impact and so feedback beyond your immediate context can be invaluable. Relatedly, pedagogical research should aim both for significance i.e. the potential to influence policy and/or practice, and reach i.e. the extent to which the intended

audience is engaged (Evans et al., 2021); and preprints support these aims. A common concern is that preprints dilute published paper impact, but the opposite is true; papers with preprints receive more citations and higher Altmetric scores, even when controlling for article and journal variables (Fu & Hughey, 2019).

Finally, preprints offer a sustainable way to ensure green open access, making outputs freely accessible via repositories. This is especially useful when article-processing funds are limited but can also boost the paper's reach and impact. Huang et al. (2024) found that not only do open-access publications receive a higher citation count, but that green open-access in particular is associated with the highest citation diversity. Pedagogical research is also of interest beyond those in higher education who have access to journal subscriptions and, as Booher et al. (2020) note, lack of library access is a barrier to teachers engaging with evidence.

Example

While a paper by Nordmann et al. (2019) was under review at various journals, the preprint was downloaded 770 times by the day it was accepted for publication. Sharing of the preprint also led to talk invitations, collaborations, and a job offer for the early-career T&S first author, who had no prior pedagogical publications.

Registered Reports

A second open research tool that may be a strategically useful ally for T&S scholars is 'Registered Reports'. Typically, researchers run a research study, submit their manuscript for publication, and peer review then serves to assess the strength of the contribution. This system is flawed; as Chambers (2013) has argued, feedback through traditional peer review comes too late in the research process. That is, by the time reviewers have identified limitations and provided suggestions to improve the study, it has already been conducted. To improve the efficacy of peer review, in the Registered Report publication model, researchers submit their study's hypotheses, methods, and analytical plans for review before they collect or access data. Reviewers then review the study plans and, once the study design is approved, the journal provides an in-principal commitment to publish the research, regardless of whether the results confirm or contradict the original hypotheses or research questions. This approach thus emphasises the importance of the research question and methodology over the outcome of the study and means that authors receive feedback on their study design prior to data collection.

How Registered Reports can help T&S academics

Registered Reports may be particularly useful in SoTL research, in order to improve the credibility of pedagogical evidence, which can, in turn, improve pedagogy (McAleer & Paterson, 2021). While Registered Reports have primarily been proposed as a way to mitigate publication bias and thus improve the state of the evidence, they can also strategically help T&S scholars to improve their methodological decision making, reflect more explicitly upon the analytical choices they make in advance, and strengthen the utility of peer review. This may be particularly important, given that T&S academics often report fewer opportunities for mentorship and career support, which may include support with pedagogical research (Bull et al., 2024).

There have been some examples of the benefit of pedagogical Registered Reports. Reich et al. (2020), for example, conducted a special issue of educational research which consisted only of Registered Reports. The authors and editors later reflected that the publication format encouraged a more productive,

collaborative, compassionate approach to peer review. This also strengthened the methodological choices of the authors. For example, one group of researchers who published in the special issue reflected that: "Without fearing that the paper might be rejected, we felt that the discussion became more honest and vivid as we could, for example, give sharper opinions".

The timing of peer review feedback may also be especially useful for T&S academics, who typically have a background of disciplinary research expertise, and then make the move to scholarship and pedagogical research. Many T&S scholars, therefore, may be 'new' to educational scholarship, but are not necessarily 'early career' researchers. Indeed, whilst preprints can allow for feedback after a study has been written up, Registered Reports provide a way to ensure timely and useful feedback on study plans in educational research, which can improve the theoretical and methodological robustness of proposed studies.

Further, as educational research continues to proliferate, it is also important that there are mechanisms to reduce duplication of efforts and ensure that educational research is always advancing the field and moving the literature forwards. Registered Reports provide one way of ensuring that research efforts are not wasted, and valuable data are not relegated to the 'file drawer', by providing feedback at the time when scholars need it most. This can be particularly useful for T&S scholars, who are increasingly under pressure to produce high-quality and impactful pedagogical research outputs (Bull et al., 2024).

Example

Pownall et al. (2023) ran a multi-site, longitudinal study of how pre-registration of dissertations may impact student outcomes. This study was submitted as a Registered Report. Stage 1 reviewer feedback helped the research team to carefully and collaboratively think through their choices of measures, analytical choices, and sample. This also meant that the efforts of conducting a large, longitudinal study with multiple stakeholders (31 authors) were not wasted, in that data were collected with journal commitment to publish the paper already in place.

Open Educational Resources (OERs)

Open Educational Resources, or OERs, typically refer to classroom material such as textbooks, videos or other resources that are free to be used, adapted, and shared by instructors other than the creators (OER Commons, n.d.). OERs can expand access to knowledge by providing students anywhere in the world with learning materials, as well as supporting lifelong learning (Adil et al., 2024). Like preprints, OERs can be hosted on platforms such as OER Commons, the Open Science Framework, and the National Teaching Repository, which often provide DOIs and viewing analytics. There are also a number of journals that offer specialist manuscript types that allow reflection and sharing teaching practice that are conceptually aligned with OERs, such as Scholarship of Teaching and Learning in Psychology's 'Pedagogical Primes' or the Journal of Perspectives in Applied Academic Practice's 'Case Studies'.

How OERs can help T&S academics

Beyond expanding access to materials for learners, OERs can strategically benefit creators and can specifically support T&S academics. Importantly, because materials added to a repository like the Open Science Framework provide viewing and download analytics, T&S academics can use these figures as a concrete measure of impact that can be used, for example, in promotion and award applications. As Evans et al. (2021) argue, high-impact pedagogical work improves learning, teaching, or policy, regardless of citation frequency. OERs thus provide a way for T&S scholars to diversify their outputs and evidence their impact, which is increasingly required.

More personally, sharing OERs can also be a valuable form of networking and can help identify others working on similar approaches, contributing towards Evans et al.'s (2021) conceptualisation of reach and impact. For example, the PsyTeachR collection of OER data skills resources for teaching the programming language R (PsyTeachR, 2024) has led to multiple invited talks, workshops, papers, and international collaborations for many of the T&S team, despite the resources themselves rarely being cited. Given that most T&S contracts have a relatively small proportion of time devoted specifically to research activity (typically 10-20%), sharing OERs can maximise impact by ensuring core teaching activity can still contribute towards building a profile and pedagogical networks and impact.

Similarly, OERs provide a way to share more creative or innovative pedagogical outputs that can exist beyond the constraints of traditional publishing, while still ensuring credit and recognition. For example, in 2020, Gernsbacher and colleagues published an article about the limitations of time-limited testing in higher education classrooms. To increase the reach and impact of this translational research study, the researchers created a project on OSF that featured an infographic that instructors, administrators, or other disability advocates could use to impact policy (Gernsbacher et al., 2021).

Example

A team of educators within the Framework for Open and Reproducible Research Training came together to crowdsource lesson plans and teaching activities for other educators who wish to embed open research in their curriculum. They published a paper summarising the OERs (Pownall et al., 2024), which linked to an Open Science Framework containing all of the resources, which can be updated and added to.

Conclusion

Overall, we have shown how open research tools, including preprints, Registered Reports, and OERs, can be strategically useful for T&S academics. They enhance research visibility, improve methodological decisions, reduce duplication, and maximise scholarly impact. While focusing on individual efforts here, we recognise the need for institutional, disciplinary, and cultural support for open research. Similarly, the more that institutions recognise and legitimise diversity of outputs (including preprints, OERs etc.), support collaboration and open sharing, and offer more structured mentorship, this will also make it easier for T&S academics to strengthen their work and, in turn, improve pedagogy.

Biographies

Dr. Madeleine Pownall is an Associate Professor of Psychology at the University of Leeds, specializing in pedagogical research and open scholarship. Her research explores pedagogical interventions for sustainable education and open science in the curriculum.

Dr. Raechel N. Soicher is the Assistant Director of Research and Evaluation at MIT's Teaching + Learning Lab. She focuses on implementing evidence-based practices in higher education, bridging research and practical application.

Dr. Emily Nordmann is a Senior Lecturer at the University of Glasgow, researching technology and learning, particularly lecture capture's role in supporting diverse students. She is an advocate for open science and accessible education.

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