



## Report: Evaluation of the UCL online training course on transparency and reproducibility in research



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## Summary

This report evaluates UCL's online training course on transparency and reproducibility in research, covering a) course participants' responses via the post-course survey (n=47), b) interviews with the course participants (n=8), and c) the badge micro-credential awarded to those who completed the overall course requirements (n=47), based on data up to the end of April 2023. This training course, which is ongoing, was developed following the publication of UCL's [Statement on Transparency in Research](#) in 2019, in order to provide an overview of transparency and reproducibility in research for UCL researchers, including why these topics are important and how researchers can put them into practice.

### *Training course*

This evaluation is based on the 47 participants who had completed the course by the end of April 2023, eight of whom volunteered to be interviewed. Overall feedback on the course has been very positive, with the vast majority of course participants agreeing that the course was engaging (96%), that it had improved their knowledge and skills (97%), and that they would recommend it to a friend/colleague (94%). In addition, 89% of course participants rated their overall learning experience as either good or very good.

### *Digital badge*

A digital badge micro-credential is awarded to those who complete the training course to give them recognition for having done so. The impact of the digital badge as an incentive appears to have been moderate. For a quarter (23%) of participants who completed the course, it was a strong incentive for them to sign up for and/or complete the course (they 'strongly agreed' it motivated them; while another 38% 'agreed'), while on the other end of the spectrum, a quarter (26%) of those issued the badge did not download it. For most course participants the badge appears to have been a contributing factor in encouraging them to sign up for and/or complete the course, but they were mainly driven by their interest in the course.

### *Future considerations*

Survey responses from and interviews with course participants indicate that there is appetite for further information and training, awareness raising and exploration of discipline-specific transparent research practices. Alongside this, there is an important role for positive incentives, including recognition of transparent research practices, to increase the uptake of such practices.

### *Limitations*

However, the sample size was small, and although there were participants from the majority of UCL Faculties, this cannot be considered a representative sample of research students and researchers across UCL. In addition, the feedback received was from those who signed up for the course and completed the course requirements, biasing the sample to those who are invested in this topic, since the course is not mandatory.

# 1. Background

## 1.1 The content/format of the training course

The training course on transparency in research consists of a number of animated videos, dilemmas, talks from experts and academics and an assignment. The assignment is a transparency action plan where the participants show their understanding of the training course and how they intend to apply transparent research practices within their research and their discipline. The training course overall is estimated to take 3-5 hours to complete.

## 1.2 Digital badge

After completing the training course, the participant receives a digital badge micro-credential. This is a digital picture hyperlinked to a webpage that details who has issued and received the badge and on what basis. It is intended to give participants recognition for having completed the course. The digital badge is issued via the Open Badge Factory, and the participant can access the badge via the Open Badge Passport. They can use the badge on their CV, email signature or profile, such as on social media.

## 1.3 Dissemination and advertisement of the training course

The training course was launched in July 2022. The link to and information on the training course were emailed to all departmental and/or Faculty graduate tutors across UCL for dissemination within their respective UCL Faculties and departments. It was also included in and disseminated via the UCL staff and postgraduate student newsletters. The training course is also accessible via the UCL Research Transparency [webpage](#).

# 2. Training course evaluation

Evaluation of the training course involved a post-course survey for course participants and interviews with participants after finishing the course. The survey consisted of 20 questions, which covered participants' demographics (their career level, Faculty and type of research methods they use), the training course (including strengths and weaknesses and recommendations for improvement), the digital badge, and transparent research practices (those that participants engaged in, the challenges/barriers to these practices and areas of improvement).

In the interviews, there were five main questions covering demographic information, areas of research, and challenges and opportunities for transparency and transparent research practices. Each interview focussed on the interviewee's area of research and research experiences in addition to their overall experiences of the digital badge.

## 3. Results

This report shares quantitative data from the survey and from the Open Badge Factory on badge outcomes, alongside qualitative information from the interviews and some quotes from the survey.

### 3.1 Post-course survey responses

By 30<sup>th</sup> April 2023, 247 participants had registered for the training course, and 47 had completed the full course requirements, including responding to the survey.

#### 3.1.1 Demographic information

In terms of career level, 66% of the 47 course participants were PhD students, 15% were postdoctoral research associates/research fellows, and 9% were professors/Associate Professors. The most common Faculty at which participants were based was the Institute of Education (26% of participants), followed by the Faculty of Medical Sciences (23%) and the Faculty of Life Sciences (9%).

Most of the participants took a mixed methods approach to their research (43%), followed by 38% using qualitative research methods and 28% using quantitative research methods.

Survey responses on demographic information can be found in Table 1 in the Appendix.

#### 3.1.2 Feedback on training course

Overall, the participants viewed and rated the course positively in terms of how engaging it is and whether it improved their knowledge and skills and their overall learning experience. The vast majority, 96%, agreed that the course was engaging (34% strongly agreed and 62% agreed), while 97% of the participants agreed that the course had improved their knowledge and skills (60% agreed and 37% strongly agreed). The overall learning experience, including the course content and delivery, was also rated positively by the participants as 'very good' (46%), as 'good' (43%) and as 'fair' (11%) and most of the participants, 93%, agreed they would recommend the course to a friend/colleague (55% strongly agreed and 38% agreed).

With respect to the digital badge, the majority of the participants, 62%, agreed that the prospect of earning a badge micro-credential motivated them to sign up for and/or complete the course (38% agreed and 23% strongly agreed). Similarly, 66% agreed that the digital badge micro-credential validates the course (40% agreed and 26% strongly agreed).

Survey responses relating to the training course and badge are shown in Table 2 in the Appendix.

#### 3.1.3 Strengths and recommendations for improvement

When asked what the strengths of the course are (as an optional question), 26 of the 47 course participants noted strengths of the course, including relating to the quality of the videos, animations, dilemmas, interactivity, and the relevance of the expert talks. A few quotes from respondents are shown in the box that follows.

### Quotes: strengths of the course

*“The videos and visualisations were engaging. The dilemmas were relatable and made the course feel more personally important to me.”*

*“The course is designed in a highly engaged way that makes it super interesting.”*

*“It provided a comprehensive and concise summary of why T&R [transparency and reproducibility] are important and how best to pursue them.”*

*“The course is very detailed and clear.”*

*“Information presented is concise and easily assimilable.”*

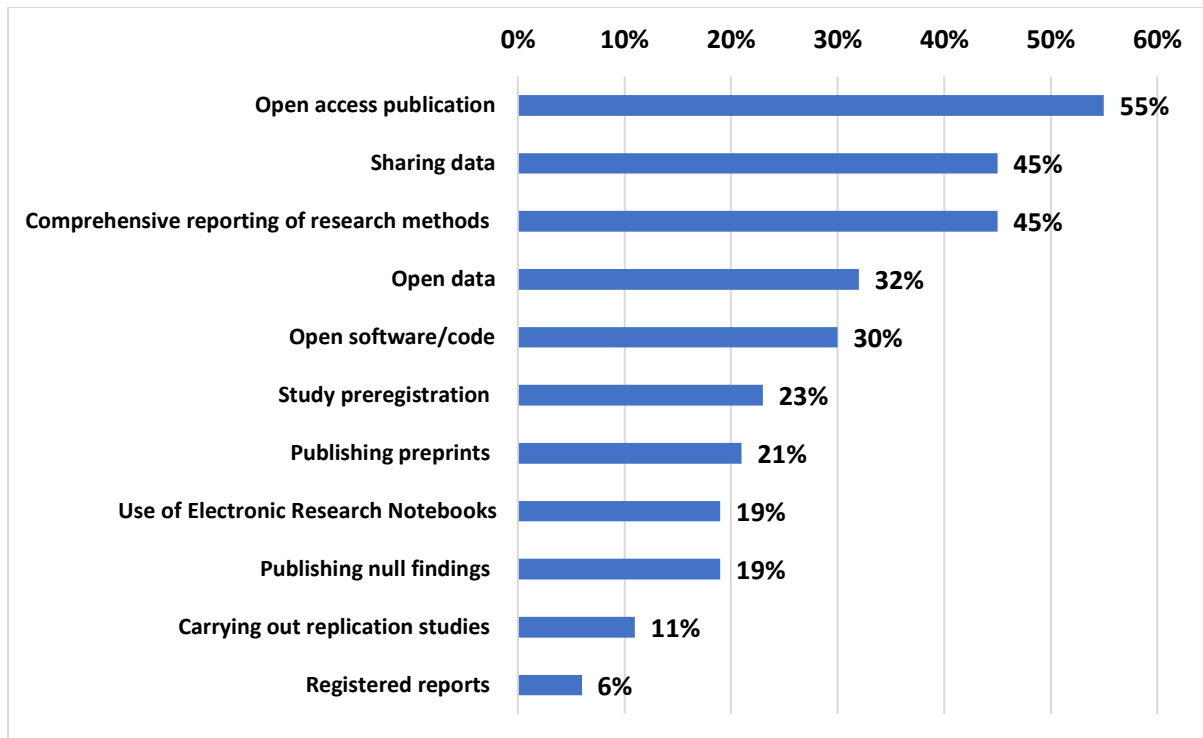
When asked about specific recommendations for improving the course, 15 out of 47 provided recommendations, including suggesting adding a one-pager that collates the links from the course, giving greater clarity on what is required to earn the badge, and providing follow-up training on transparency specific to their field of research, while two respondents recommended advertising the course more. We have taken steps to address this feedback.

When asked which topics they would be interested in additional or follow-up content for, suggested topics included transparency in qualitative research, computational reproducibility, preregistration and transparency in data analysis.

#### 3.1.4 Transparent research practices, barriers and areas of improvement

When asked about which transparent research practices the participants practised (and given specific options), the top practices were open access publication (practised by 55%), sharing data (45%), comprehensive reporting of research methods (45%), open data (32%) and open software/code (30%). Other practices, such as pre-registration (23%), publishing preprints (21%), publishing null findings (19%), and using an Electronic Research Notebook (19%) were also reported (Figure 1).

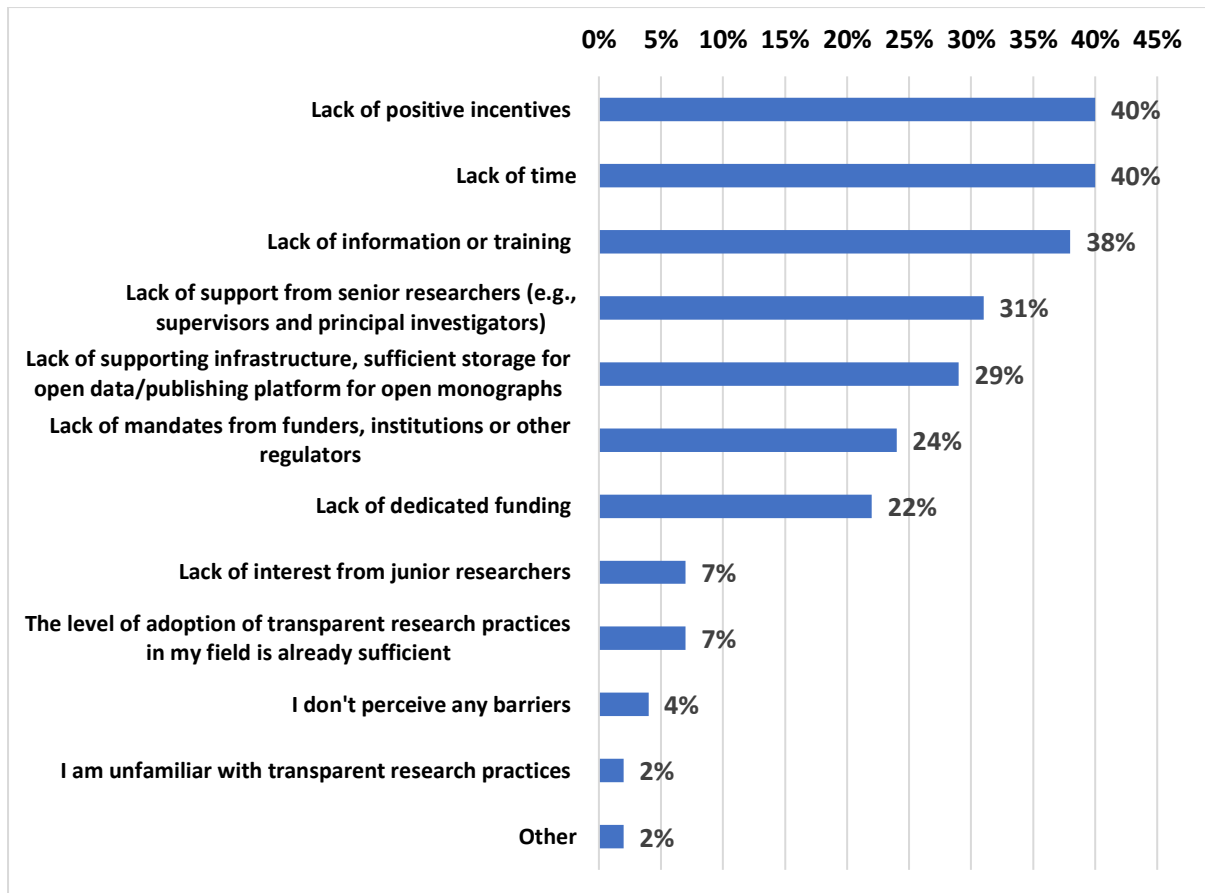
Since the majority of respondents were early on in their career, relatively low past use of transparent research practices is to be expected. What is of more interest is the comparison between rates of use of different practices, such as the commonly used open access publication compared to less commonly used practices such as use of Electronic Research Notebooks.



**Figure 1** Which of the following transparent research practices have you practised? Multiple options are possible (n= 47). This question was adapted from the [Brief Open Research Survey](#).

With regard to motivation, the majority of the participants, 98%, said that they felt motivated to pursue transparent research practices in their research (70% strongly agreed and 28% agreed), with 2% neither agreeing nor disagreeing.

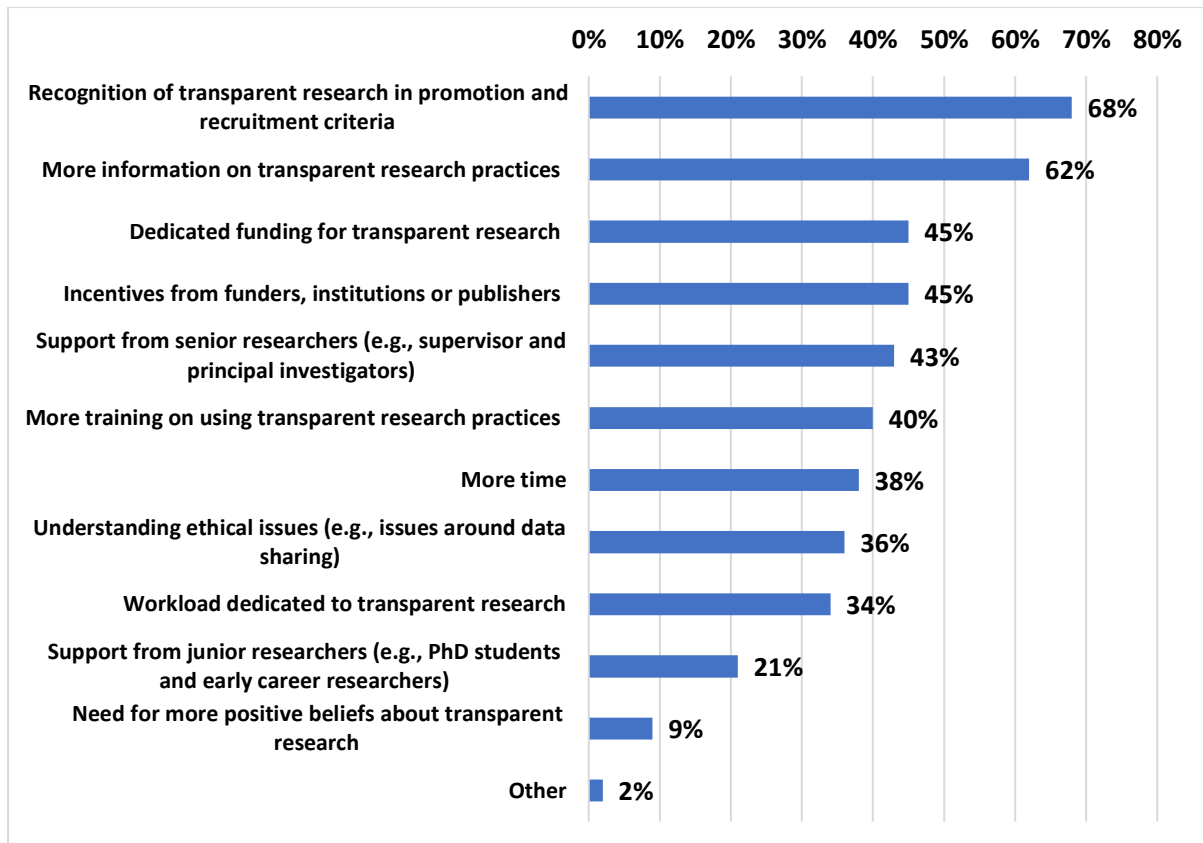
When asked what participants saw as barriers to the uptake of transparent research practices (and given specific options from which to choose), the most commonly reported barriers were a lack of positive incentives (40%) and a lack of time (40%), followed by a lack of information or training (38%). Other barriers reported included lack of support from senior researchers, including supervisors and Principal Investigator (31%), lack of supporting infrastructure, sufficient storage for open data/publishing platform for open monographs (29%), lack of mandates from funders, institutions, or other regulators (24%) and lack of dedicated funding (22%) (Figure 2).



**Figure 2** What do you see (if any) as barriers to the uptake of transparent research practices in your field? Multiple options are possible (n=47). This question was adapted from the [Brief Open Research Survey](#).

Furthermore, when asked what would help them to use more transparent research practices (and given specific options from which to choose), participants highlighted the recognition of transparent research practices in promotion and recruitment criteria (68%), more information on transparent research practices (62%), followed by dedicated funding for transparent research practices (45%), then incentives from funders, institutions, and publishers and support from senior researchers including supervisors and principal investigators (43%). Other areas, such as more training on using transparent research practices (40%), more time (38%), and understanding ethical issues, including issues around data sharing (36%), were also considered important areas for further support (Figure 3).





**Figure 3** What would help you to use more transparent research practices? Multiple options are possible (n=47). This question was adapted from the [Brief Open Research Survey](#).

### 3.2 Interviews

In total, eight participants volunteered to participate in a virtual interview after completing the training course in return for a £20 voucher, and each interview lasted for approximately one hour.

The interviewees were at different stages of their studies and careers; five were PhD students and three were postdoctoral research fellows. They were based in the Faculties of Life Sciences, Medical Sciences, Brain Sciences, Bartlett Faculty of the Built Environment, Engineering, and Arts and Humanities.

The understanding of transparency, its fluidity with related terms (e.g., openness and reproducibility) and the applicability of these concepts to different forms of research was highlighted, especially by researchers in the Arts and Humanities (i.e., qualitative-based research and methods). For example, they noted that there can be challenges in understanding the nuances between the terminologies, such as transparency, reproducibility and openness, and considered how to better standardise what is understood by these terms. For instance, one approach that was discussed was to consider the specialised nuances of transparency through both a consideration of transparency from a theoretical perspective and also its applicability in practice across different research areas.

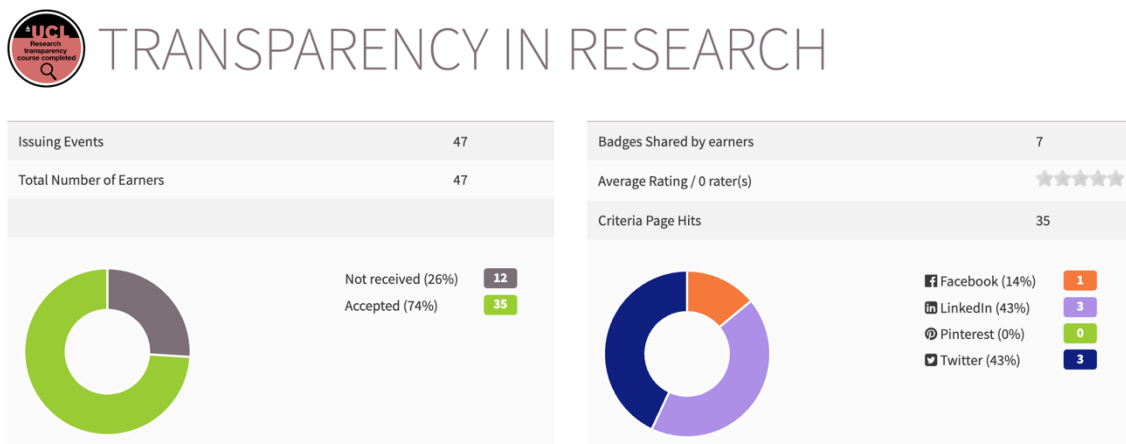
In relation to the main challenges around research transparency, participants based in the Faculties of Life, Medical, Brain Sciences and Engineering tended to report lack of time and lack of training on

research-specific software (e.g., Electronic Research Notebooks, Python, MatLab), variability of software used in reporting and lack of standards and protocols for field-specific experimental studies.

Overall, most of the interviewees agreed that the digital badge was not their main motivation for signing up for the course. They considered learning about transparency and transparent research practices, with their application to their research area, as the main motivation. In addition, the majority of the interviewees, based on their diverse experiences but also the relevance of the course to different fields of research, recommended including the transparency in research training course as a part of the UCL mandatory training courses, especially for new starters at UCL, for example, research students and staff.

### 3.3 Digital badge use

The digital badge micro-credential was issued to the 47 participants who completed the course by 30 April 2023. Badges were issued via the Open Badge Factory, and participants received a guide on how to access the badge and use it on social media accounts, their CV or profile. The participants could access the badge and download it via the Open Badge Passport. Figure 4 shows a breakdown of how the badge was used by the participants in terms of sharing it on social media and using it on their CVs or profile. The majority, 74%, of participants accepted and downloaded their badge, and there were seven instances of the badge being shared on social media (LinkedIn, Twitter and Facebook).



**Figure 4** Open Badge Factory report on participants' use of the digital badge system (n=47). Percentages on the right relate to the proportion of total badge shares on social media (7 badge shares in total) that are associated with each social media platform, not the proportion of participants who shared their badge.

## 4. Funding

This work was supported by the UCL/Wellcome Institutional Strategic Support Fund (Grant Reference 204841/Z/16/Z).

## Appendix: Post-course survey data

<b>Table 1</b> Demographic characteristics of the training course participants		
<b>UCL Faculties they are based in (n=47)</b>	<b>Percentage of respondents</b>	<b>Number of respondents (out of 47)</b>
Art & Humanities	6%	3
Bartlett Faculty of the Built Environment	2%	1
Faculty of Brain Sciences	13%	6
Engineering	6%	3
Institute of Education	26%	12
Life Sciences	9%	4
Mathematical & Physical Sciences	13%	6
Medical Sciences	23%	9
Population Health Sciences	4%	2
Social and Historical Sciences	2%	1
<b>Career level (n=47)</b>		
Taught Master's student	6%	3
MRes student	2%	1
PhD student	66%	31
Postdoctoral Research Associate/Research Fellow	15%	7
Associate Professor/Professor	9%	4
Others	4%	2
<b>Main Research methods (n=47)</b>		
Qualitative Research methods	38%	18
Quantitative Research methods	28%	13
Mixed	43%	20
Other	2%	1

<b>Table 2</b> The training course evaluation questions and motivation to pursue transparent practices in research as reported by the training course participants						
<b>The training course evaluation questions</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neither agree nor disagree</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Total</b>
The course was engaging	34% (n=16)	62% (n=29)	4% (n=2)	0	0	47
I feel that my knowledge and skills have improved by taking the course	37% (n=17)	60% (n=28)	4% (n=2)	0	0	47
I would recommend this course to a friend/colleague	55% (n=26)	38% (n=18)	6% (n=3)	0	0	47
I feel motivated to pursue transparent practices in my research	70% (n=33)	28% (n=13)	2% (n=1)	0	0	47
The prospect of earning a badge micro-credential motivated me to sign up for and/or complete the course	23% (n=11)	38% (n=18)	30% (n=14)	6% (n=3)	2% (n=1)	47
I feel that the badge micro-credential validates the course	26% (n=12)	40% (n=19)	21% (n=10)	11% (n=5)	2% (n=1)	47
	<b>Very good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>	<b>Very poor</b>	<b>Total</b>
How would you rate your overall learning experience (e.g., course content and course delivery)?	43% (n=20)	46% (n=22)	11% (n=5)	0	0	47

<b>Table 3</b> Transparent research practices, barriers and areas of improvement as reported by the training course participants		
Which of the following transparent research practices have you practised? Multiple options are possible (n= 47)	<b>Percentage of respondents</b>	<b>Number of respondents (out of 47)</b>
Open access publication	55%	26
Sharing data	45%	21
Comprehensive reporting of research methods	45%	21
Open data	32%	15
Open software/code	30%	14
Study preregistration	23%	11
Publishing preprints	21%	10
Use of Electronic Research Notebooks	19%	9
Publishing null findings	19%	9
Carrying out replication studies	11%	5
Registered reports	6%	3
What do you see (if any) as barriers to the uptake of transparent research practices in your field? Multiple options are possible (n=47)	<b>Percentage of respondents</b>	<b>Number of respondents (out of 47)</b>
Lack of positive incentives	40%	18
Lack of time	40%	18
Lack of information or training	38%	17
Lack of support from senior researchers (e.g., supervisors and principal investigators)	31%	14
Lack of supporting infrastructure, sufficient storage for open data/publishing platforms for open monographs	29%	13
Lack of mandates from funders, institutions or other regulators	24%	11
Lack of dedicated funding	22%	10
Lack of interest from junior researchers	7%	3
The level of adoption of transparent research practices in my field is already sufficient	7%	3
I don't perceive any barriers	4%	2
I am unfamiliar with transparent research practices	2%	1
Other	2%	1
What would help you to use more transparent research practices? Multiple options are possible (n=47)	<b>Percentage of respondents</b>	<b>Number of respondents (out of 47)</b>
Recognition of transparent research in promotion and recruitment criteria	68%	32
More information on transparent research practices	62%	29
Dedicated funding for transparent research	45%	21
Incentives from funders, institutions or publishers	45%	21
Support from senior researchers (e.g., supervisor and principal investigators)	43%	20
More training on using transparent research practices	40%	19
More time	38%	18
Understanding ethical issues (e.g., issues around data sharing)	36%	17
Workload dedicated to transparent research	34%	16
Support from junior researchers (e.g., PhD students and early career researchers)	21%	10
Need for more positive beliefs about transparent research	9%	4
Other	2%	1