



## Article

# Evaluating the Impacts of a Research Ethics Training Course on University Researchers

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**Abstract:** Training in research ethics is an essential part of professional development for graduate students and academic and research staff at universities and other research institutions. Certificated training in research ethics has been offered at the University of the Witwatersrand, Johannesburg, South Africa, since 2019. This training comprises a 4 h content-based workshop followed by a written assignment with attendees who are mainly graduate students and academic staff of the University. This study presents the results of an anonymous online survey that evaluated the impacts of the ethics training on researcher professional activities, in particular where their research deals with human participants. Those invited to take part in the survey were the successful attendees who had attained a Certificate of Competence in Research Ethics. Results (n = 92) showed that the majority of respondents were satisfied with the nature, format and depth of content of the training, and reported that it has a positive impact on their development as researchers. Specifically, this included thinking through their project design, and developing critical thinking and problem solving skills related to their project. Overall, the results highlight the importance of research ethics training in researcher development, as well as engendering critical reflection on ethical issues in different research contexts. It also shows the importance of ethics training in a ‘live’ session where participants are able to ask questions, engage in debate, and undertake a written assessment that tests their application of ethics concepts.

**Keywords:** academic development; graduate studies; human participant research; research ethics; research training; social science research



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## 1. Introduction

Research ethics is increasingly recognised as an important element in the professional training and development of all types of researchers—in academia, government and industry—and at all levels, from students to professional researchers, technicians and consultants (Beauchemin et al. 2022; Brear and Gordon 2021; Knight 2019; Pillay and Qhobela 2019). The interactions of researchers with any research participants have potential to give rise to negative outcomes for those participants, to the researchers, and to wider society (Ratnam and Drozdowski 2022). Landmark documents and international guidelines, such as the Belmont Report and the Singapore Statement on Research Integrity, help frame the development of research ethics practices and processes at the international level (Fischer 2006; Friesen et al. 2017; Nagai et al. 2022). However, how these principles are applied at the national level depends on national policies and procedures which are themselves set in a legal and regulatory context. In addition, ethics review processes and requirements may vary between institutions or academic disciplines, and this can give rise to inconsistent standards and practices (Kalichman et al. 2015; Mumford et al. 2015; Rudra and Lenk 2021). Hitherto, most research ethics training developed worldwide has been in medical rather than non-medical contexts, including in the fields of nursing, psychiatry, clinical medicine and bioethics (e.g., Bravin et al. 2020; Chen 2003; Cummings et al. 2018; Halkoaho et al. 2013; Sullivan et al. 2020). By contrast, research ethics training in the social sciences is

relatively less well developed (Emmerich 2016) but has engaged with overarching issues of participant vulnerability, traditional knowledge systems and cultural diversity (e.g., Knight 2019; Koloï-Keaikitse et al. 2021; Tjldink et al. 2021; Valkenburg et al. 2021). Nevertheless, there has not been a systematic assessment of the effectiveness and transformative potential of research ethics training for social science researchers; this study contributes to this debate.

Undergoing ethics clearance for a project is often seen as a key way for researchers to develop an understanding of ethical issues in research (e.g., Brown et al. 2020; Madikizela-Madiya and Motlhabane 2022; Sivasubramaniam et al. 2021). Evaluating and mitigating risk and vulnerability is an essential part of research design and planning (Bonde et al. 2016; Gannon 2014), and appropriate research training can help researchers, and especially graduate students, to navigate these ethical issues (Löfström 2012; Rashid 2020). This means that consideration of research ethics, amongst a range of other issues related to academic integrity, should be seen as an important part of the development of the professional practice of researchers (Tammeleht et al. 2022; Valkenburg et al. 2021). Despite this clear relationship between researcher training in ethics and the ethical conduct of those researchers when they are engaged in data collection and analysis using human participants, there is often a mismatch between training and practice (Brown and Kalichman 1998; Hildt et al. 2019). One reason for this is that obtaining ethics protocol clearance for a particular study is often seen as a 'tick-box' exercise rather than an activity that can lead to ongoing self-reflection of one's own professional practice and the better design of any project (von Unger 2016). A second reason is that ethics training is not always integrated with training in other research methodologies and study design elements for graduate students, but seen as a stand-alone activity outside of the successive stages of completing a research degree (e.g., writing a proposal or a literature review, presenting at a conference, writing a paper) (Brown et al. 2020; Dowling Dols et al. 2017; Farrugia 2019). Thus, the lack of seamless integration of research ethics as part of ongoing research training hinders its development through academic programmes at the institutional level worldwide (Beauchemin et al. 2022; Hansson 2011; Tjldink et al. 2021).

In order to better address these limitations of research ethics training and research professional development, more integrated and ongoing researcher training is required, especially for graduate students in the social sciences. Most research ethics training that is currently on offer, both internationally and within individual institutions, has most commonly been developed in a medical rather than a non-medical (social science) context at these institutions, despite social science researchers having different requirements for ethics training because of the different ways in which they may interact with human participants and their data (Emmerich 2016; Kalichman et al. 2015; Sheehan et al. 2018). This study aims to evaluate the effectiveness of research ethics training (mainly for social science researchers) at one university through surveying successful attendees on their experiences and perceptions of the training and its impacts on their research and academic development. This is based on results from an anonymous online survey.

## 2. Background and Institutional Ethics Training

The University of the Witwatersrand, Johannesburg, South Africa, has offered certified training in research ethics since April 2019, designed and run by the author, who chairs one of the University's research ethics committees (RECs). The University of the Witwatersrand is a research-intensive institution with some 1174 permanent academic staff across five faculties and 33 academic schools. In total 39.4% of the total student population of 42,175 are in graduate programmes (2021 figures), including 2470 PhD and 8267 Masters students. The University has a number of research ethics committees to oversee research projects undertaken by academic staff and graduate students, and these committees are registered with the National Health Research Ethics Council (NHREC), a national statutory body established under the Health Act of 2003. A guideline document (in 2015) provided by the NHREC states that researchers should receive adequate training in research ethics,

as well as clearance from an REC, prior to the commencement of their study. However, there are very limited options available for research ethics training in South Africa through an accredited institution or through online courses. This was the motivation of the author to develop a short but intensive research ethics training workshop in 2019, which has continued to date.

This training comprises a 4 h content-based workshop followed by a written assignment. Attendees are mainly staff and graduate students of the University, with a few external researchers from other institutions and agencies. In detail, the workshop comprises an academic lecture (presented in PowerPoint) of approximately 2½ h duration dealing with key issues in research ethics. In sequence, the lecture discusses: (1) the meaning and definition of ethics, including normative and research ethics; (2) the nature of 'research', who researchers are and how they may interact with human participants in different ways; (3) different philosophical approaches to relationships between the individual and society, as developed by Kant, Bentham and others; (4) the role of ethics in decision-making; (5) a description of post-World War II developments in research ethics, including the Nuremberg Code, Declaration of Helsinki, Belmont Report and Singapore Statement on Research Integrity; (6) the legislative and regulatory framework of research ethics in South Africa and how research ethics processes are managed at the University of the Witwatersrand; and then (7) detailed discussion of key ethical principles that are important in social science research in the developing world, including informed consent, confidentiality, vulnerability, and risk. Throughout, cognisance is made of the specific African research context, including wider issues of social responsibility, social justice, traditional knowledge and Ubuntu, and respect for the authentic voice of the participant. This lecture is then followed by an open question and answer session. After a comfort break, the second part of the workshop (approximately 1 h duration) describes how to make an ethics application to the University's REC. This element is not discussed further in this study.

Since the training began in April 2019, 30 separate training sessions have been run, with 7 to 139 attendees in each session. Some of these sessions were face-to-face; during and coming out of the COVID-19 pandemic, the training has been run as a live session online through MS Teams. In total 1821 people have attended the training (to December 2022). Following the training, all attendees are sent the presentation slides, key readings, a reading list, and have an opportunity to complete and submit a certificated assignment. This assignment comprises three compulsory short-answer essay questions based on topics discussed in the workshop. The questions asked are different for each training session. Typical questions have included:

- Discuss the demographic factors that might give rise to increased vulnerability.
- Describe the different ways of obtaining informed consent for studies that are conducted online.
- What are some of the ethical issues involved in using social media posts as research data?
- Discuss some of the ethical issues associated with illiteracy amongst participants.
- A research study uses orphans as participants. Identify and discuss some of the major ethical issues of such a study.

These questions require the attendees to integrate elements from different parts of the lecture and show the application of key concepts to real-world situations. These questions are specifically designed to promote reflection and problem-solving, as a way of developing researchers' skills and understanding. The answers provided by attendees are then evaluated by the workshop leader on a pass/fail basis. If attendees pass all three questions, they receive a Certificate of Competence in Research Ethics, valid for 3 years, which provides evidence of research ethics training and fulfilling the requirements of the NHREC. These certificates are produced and signed by the Research Office of the University, which administers graduate research training across the University. To date (December 2022), 796 attendees in total have received a Certificate of Competence in Research Ethics (43.7% of all attendees for the period 2019–2022). In detail, in 2022 there were 793 attendees (11 monthly training sessions were run), of which 450 (56.7%) submitted an assignment. Of

these 450, 87 (19.3%) failed, the main reasons being that they did not answer the questions posed or did not resubmit with corrected answers when asked to do so. Attendees are given several resubmission attempts, where needed. This gave a pass rate in 2022 of 45.8%.

### 3. Methods

This study can be considered as mixed-methods in its approach because it involved some quantitative analysis of the survey results. The study focused on evaluating the experiences of attendees who had obtained a Certificate of Competence in Research Ethics following training in the period April 2019–November 2021, inclusively (n = 421). A confidential database of email addresses of successful attendees had been maintained through this time and this was used to contact potential participants in this study. All potential participants were adults over the age of 18. Following institutional ethics clearance being obtained (protocol H21/11/30), all potential participants were emailed with detailed participant information sheet about the study and a hyperlink to the online survey. The information sheet stated that the online survey would take around 15 min to complete, and completing and submitting the online survey will be taken to mean consent to participate; the original survey data would be destroyed after 5 years, and the survey would be both anonymous and confidential. The maximum number of potential participants was therefore 421 but it also was likely that the actual number would be significantly lower because former students may have left the University (and therefore their student email addresses would be invalid). The online survey was run through Survey Monkey (<https://www.surveymonkey.com/>, accessed on 10 January 2023) and comprised ten open-ended questions (Table 1).

**Table 1.** The questions posed in the study survey.

Questions Posed	Nature of the Answer Required
Q1. You attended one of the Research Ethics training sessions. How did you find this training, was it useful or interesting? Please explain your answer.	Free text
Q2. Did the training give you increased awareness of ethics in research? Please explain your answer.	Free text
Q3. Did the training help you to better plan or implement your research project, such as its methodology? Please explain your answer.	Free text
Q4. Did the training (and the self-reflection based thereon) help develop your skills as a researcher? If so, how?	Free text
Q5. Did the training help you identify and solve any ethical problems in your research? Please explain your answer.	Free text
Q6. Having now attended the training, what in your view are the advantages and disadvantages of the nature of the training (e.g., its style, length, depth/breadth, frequency, etc.)? Please explain your answer.	Free text
Q7. To receive the certificate, you had to write some short essay-style answers. Did this assignment help you to understand or articulate the ethical issues discussed? Please explain your answer.	Free text
Q8. Would you change anything about the nature of the assignment (e.g., its length, style, format, etc.)? Please explain your answer.	Free text
Q9. Do you have any other suggestions for how the university or your faculty/school/organisation might better develop aspects of research ethics through its activities or training opportunities? Please explain your answer.	Free text
Q10. Please rate your overall experience of the research ethics training and its impacts, on a scale of 0 (very bad) to 10 (very good).	Self-selected number from 0 to 10

In total, 92 individuals completed the survey (21.9% response rate), following an initial email invitation and a later reminder, with responses completed in the time period when the survey was open, between 1 January and 22 March 2021 inclusively. Anonymous responses from the survey were analysed thematically. Supporting evidence through quotations from anonymous participants are presented below.

## 4. Results

Results from the online survey are grouped and presented according to the themes of the questions posed. First, the nature of the training itself is briefly considered (Q1, 6, 10; Table 1), then the training activities and assessment (Q7, 8). Most concern is paid to the questions dealing with the relationship between ethics training and researchers' critical self-reflection and development (Q2–5). Overall, the majority of survey respondents were satisfied with the nature, format and depth of content of the training, and reported that it had a positive impact on their development as researchers.

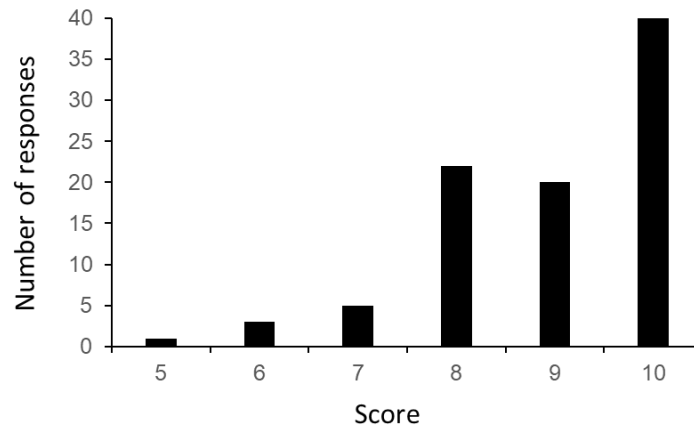
### 4.1. The Nature of the Ethics Training

Q1 asked whether the ethics training was useful or interesting. All (100%) of the respondents (n = 92) agreed that it was indeed useful and/or interesting, and from different perspectives. For example, comments from different respondents included: *'Yes it was useful, particularly in my role as research supervisor both in undergraduate and postgraduate studies in the School of Humanities'*; *'Extremely useful training. I was not aware of all the subtle elements required when considering ethics approval for humans'*. Other items voluntarily mentioned as explanation included: the relationship to obtaining institutional ethics clearance (n = 14), the historical context of research ethics (8), the wider context of research ethics in social science (8), an increased knowledge about ethics (which was discussed in the research training) (7), applications to different research situations (7), exposure to new ideas and content (5), application to the better supervision of students by lecturer attendees (4), how to deal with vulnerable groups (4), and the skill/knowledge of the trainer (3). For example, a respondent commented: *'The training sessions were very useful to me in that I was at the early stages of my PhD. The training enabled me to understand the ethics application process I was to undergo for my PhD research. Secondly, I am a lecturer myself, and I supervise students who often need ethics clearance. The training has empowered me with knowledge to guide my students on the ethics clearance process'*. Other comments mentioned that the training was more theoretical than practical, and that it could have provided more specific examples.

The nature of the training workshop itself was discussed in Q6 (Table 1). Responses (n = 88) mentioned most commonly the length of the training (n = 18) as both too long and too short—comments included: *'The training is of a reasonable length and covers all the basics within the time given for it. However, it is not frequent and so it's easy to forget some concepts and the long yet very brief notes given do not make it easy to remember the information provided in the training'*; *'The major advantage is that its style of delivery is very compressed and detailed, however, its short period of delivery could be disadvantageous as so much information is presented in a short period of time'*. Other comments mentioned: the depth and intensity of training (10), the timing/frequency of training (9), and making the training compulsory (4). Comments on these elements from different participants included: *'Style is great as I appreciated the history lesson before the actual lecture on research ethics. Please continue with the compartmentalisation. The length is important to ensure breadth is achieved. The information shared and pace of delivery by the lecture was excellent'*; *'The presenter was very knowledgeable and managed to provide appropriate examples throughout the training sessions. It might be useful to change the format into a more interactive workshop and smaller groups to ensure learning from peers is also incorporated'*. Overall, 46 comments (52%) were mainly positive, 14 (16%) were negative, and 19 (22%) comments included both elements. Some other responses (9, 10%) were inconclusive. The free-text comments highlighted a range of topics and suggestions. These included: going into some elements in more detail, presenting it to students at the beginning of the year, running the workshop over several days, and offering more interactive elements.

Five respondents specifically commented on the requirement of having to write an assignment. Detailed free-text comments on this element included: *'I think for me having to submit an assignment was a huge advantage as it pushed me to read and to think critically. However, the assignment part is a deterrent to some and this to me shows that some do not really like reading and being assessed'*; *'I enjoyed the training. I did not enjoy the assessment. Even so, I found the whole experience really good'*.

The overall experience of workshop participants was rated in Q10 along a scale from zero (low) to 10 (high). The distribution of responses ( $n = 91$ ) is shown in Figure 1. The results have a mean value of 8.94 (range 5–10), median of 9 and mode of 10.



**Figure 1.** Distribution of responses to question 10 ( $n = 91$ ).

#### 4.2. The Nature of the Ethics Training Activities and Assessment

Q7 concerned the nature of the written assignment. Overall, almost all of the respondents ( $n = 91$ ) agreed that doing the assignment had helped them understand ethical issues ( $n = 90, 99\%$ ). The respondent who disagreed with this said: *'I found the exercises useful but not specific enough in terms of evaluation—I think the lack of understanding of how the essays would be evaluated took away from the value of the research involved, that is to say: I was more focused on "passing" because I didn't know what was required than doing a comprehensive study on the topic'*.

Themes of the free-text comments made by the respondents to this question included: that the assignment made them think more deeply ( $n = 17$ ) and they engaged in critical thinking (10). Comments on these points included: *'Yes, it helped me to process the information I had learnt and to read more on the topic. The research articles shared by the lecturer were very useful to guide the learning and to cement what was taught in the lecture'*; *'Yes, the assignment required good understanding and interpretation of ethics in research. It also enhanced understanding by giving practical and real-life scenarios'*; *'Yes, the assignment was essential in applying the lessons learnt and also engage in critical thinking on ethical issues in research'*. Some respondents also noted some issues related to reading articles from the reading list provided (9), the reading list was useful (4), there were problems in understanding the assignment questions (3), and there were useful practical examples given (3). One participant commented: *'It really required a lot of depth and understanding. It was set at a very good and difficult level. This was not just a "check-the-box" assessment'*.

When asked about any changes to the written essay assignment (Q8), most of the respondents ( $n = 89$ ) stated that the assignment was fine and needs no change (68, 76%). Comments included: *'No, it forces a researcher to engage with the content of research ethics which I found to be helpful'*; *'No, the assignment is clear and precise. It allows for the student to interpret what was taught using their own understanding. The lecturer was also not prescriptive about writing style which allowed for you to focus on sharing your understanding of the question and not get lost in writing style requirements'*. Other comments mentioned: a greater submission time for the assignment (attendees get a week to complete it) ( $n = 4$ ), that the assignment questions were challenging (3), and that it encouraged critical reflection (2). Some respondents also requested a greater word count; others requested a smaller word count. On this point, one respondent noted: *'Initially, I thought that the 300–400 word limit was very restrictive—but it actually made me condense my thoughts into succinct sentences'*.

#### 4.3. Ethics Training and Researcher Development

One of the major proposed outcomes of the ethics training was to embed ethical principles in research practices at all levels, and to facilitate the self-reflection of researchers. Q2 asked whether the training led to an increased awareness of ethics. The responses (n = 92) were dominantly explicitly yes (88, 96%) with the other responses favourable but less clear. Specific comments included: *'Yes it did. The literature on the various aspects of vulnerability and vulnerable groups was an eye-opener'*; *'There was quite a lot I didn't know about ethics but through the training I was made aware and became quite conscious about ethics in my study'*; *'It did, my views on ethics in research were always rather one dimensional. This training assisted me in looking at ethics from a different perspective'*.

The training also promoted that attendees view ethics and its relationship to research in different ways. Some comments on this point included: *'Yes, especially how it arose from medical ethics—and how it is applied in humanities'*; *'Yes it did. As a scientist, I have been doing research for +30 years on inanimate subjects. During this time, it never really occurred to me that many of the principles actually applied to my work'*. Such comments show how the ethics training had potential to promote reflection and the application of ethics principles to the specific contexts relevant to different researchers. One key element was whether the research training helped researchers better plan their project and improve their methodology (Q3). Respondents to this question (n = 90) dominantly agreed with this proposition (75, 83%). Comments included: *'Yes, it assisted in thinking through ethical pitfalls and how these may be addressed'*; *'It helped me to redesign my research methods'*; *'Very much so. I could clearly see possible ethics issues and design the research to solve them'*. The majority of those who did not agree that the training helped them stated that they had already designed their project or submitted their research proposal (5), or that their project did not involve human participants (3). One interesting outcome on this point was that respondents become more confident in their approach and actions as researchers. Comments included: *'Yes it did and also gave me courage to use other methods of data collection as I knew better how to address ethical issues that may arise as a result of my study'*; *'Absolutely—not only did it make me revise my whole methodology but it gave me more confidence in my amended approach'*; *'Of course, my existing research skills were sharpened. I have also noted my increased knowledge and confidence in teaching, reviewing and guiding research students in the subject matter'*.

These overall results are supported by the follow-up question on whether the training helped develop the researcher's skills (Q4) (n = 90). Most of the respondents (84, 93%) agreed that the training achieved this outcome. Specific comments included: *'Yes it did. The training also covered the issue of different methods of getting consent from participants, and the formulation of questionnaires. This was helpful to me'*; *'It helped me especially in my methodology and even the types of questions to ask participants'*; *'I have become aware that there is a link between research methodology and ethics. The way the methodology is formulated will determine whether an ethics application will succeed or not'*. It is noted that these comments cover both practical elements, such as deploying a particular instrument, and more general issues of research approach. This may indicate that such ethics training may help develop different types of researchers' skills. Other respondents, however, were not sure that the training developed their skills (n = 4). One comment was: *'It is hard to reflect on how my skills as a researcher have improved when I make very little progress in my research. I assume that understanding the need and the basis for ethical clearance does improve and refine the research process, but I have not felt this yet'*.

In terms of whether the training helped solve any ethical problems in their research (Q5), the results are more mixed. Of the respondents to this question (n = 86), the majority said yes (57, 66%). Comments included: *'The training did help, but I did not detect problems that had to be solved'*; *'Yes. I exposed weaknesses with my methodologies'*; *'The training helped me to realise that the way my questions were phrased were insensitive and may discourage conversation and offend participants. The training made me realise that I needed to be more mindful in the way I ask my participants questions'*. This may indicate

the important role of training as a way to prevent ethical issues arising in the first place. Other respondents (n = 19) said that they had no ethical problems in their study anyway. Comments included: 'Not really as I made sure these were addressed at the planning stage thanks to the training'; 'It has not. At most, it got me thinking deeper about the nature of my research'.

## 5. Discussion

Research ethics training is a vital part of wider research training in data collection and analysis methodologies for social science graduate students, and as professional development for more experienced researchers (von Unger 2016). There is also now a greater awareness of the societal context in which research takes place, especially in the social sciences and humanities, and how researchers interact with participants at the community level (Hopkins et al. 2022; Hosseini et al. 2022; Koloi-Keaikitse et al. 2021). This is particularly important in a developing world context (Knight 2019; Nyirenda et al. 2020; Seehawer 2018) where research participants may exhibit higher vulnerability (Horn 2007; Ramabu 2020; Ratnam and Drozdowski 2022) but where it is important that the authentic voices of participants and indigenous (traditional) knowledge are allowed to come through in data collection and reporting (Knight 2019; Tangwa 2017). All of these issues highlight that social science research projects with human participants require careful design and management, facilitated through systematic training activities and critical self-reflection on the part of researchers (Beauchemin et al. 2022; Daku 2018; Pimple 2002; Tjink et al. 2021). Ethics training is the starting point of this self-reflection journey.

Although this study deals with a specific ethics training course, its results highlight the varied benefits of ethics training for researchers. This includes providing an opportunity for critical reflection on their own research practices, understanding of their positionality, reflection on project design, a better understanding of the nature of risk and vulnerability, and how risk can be mitigated. The free-text comments from different questions also showed that these outcomes were nuanced and variable, likely because of the wide range of backgrounds and experience of the attendees. Whilst a demographic breakdown of attendees was not been kept, all training sessions included researchers at different levels (from Honours (4th year) students to full professors) and at different stages in the research process (from planning a single degree project to having completed many projects and publications). The attendees also came from different disciplines, ranging from health science to engineering, from physics to psychology and drama. This means that the attendees may have different expectations, levels of engagement, or types of training required that is relevant to their needs. Inevitably this means that generic ethics training cannot be relevant to everyone all the time.

The literature highlights the need to embed training in discipline-specific contexts so that attendees can better engage with the content and apply it to their own topics (Hildt et al. 2019; Kalichman et al. 2022; Valkenburg et al. 2021). In answer to Q9 on how the institution may further develop ethics training (n = 85), comments included: making it compulsory for all staff/students (n = 15), developing more ethics activities at faculty or school level (10), tailoring the training to specific disciplines (6), and developing it as a stand-alone course/module (6). These comments highlight that the training is valued irrespective of the background of the researcher, but that there needs to be a balance between general ethics principles and how these can be enacted in specific cases (e.g., Chen 2003; Hunt and Godard 2013; Pimple 2002). Several respondents' comments for Q3 and Q5–8, however, mentioned that the training provided specific examples and applications from different contexts.

A clear theme in the results of this study is that the written assessment task was important in focusing the minds of the attendees on specific ethical issues, applying the information from the training lecture into their own contexts, and in articulating their understanding in a formal, academic and written format. Comments from respondents (for Q7) supporting this view included: 'The questions stretched my thinking and enabled me to apply what I had learnt in class'; 'I was able to put into my words what I had learned



during the training. Through coming up with solutions for the ethical issues in the assignment, I was able to gain a bit more understanding of ethical issues'; 'The questions also required critical thinking, which helped me to understand ethical issues in more detail'. Some previous studies have also identified the importance of collaborative learning through class discussion (e.g., [Brown and Kalichman 1998](#); [Danowitz and Taylor 2011](#); [Tammeleht et al. 2022](#)) and written assessment in crystallising knowledge and encouraging reflection ([Katsarov et al. 2022](#)). It should be noted that the assessment element of most online ethics training options is through multiple-choice questions, which is based on rote learning with no opportunity for reflection or discussion of the nuances of ethical problems. Other training options use attendance rather than attainment as a criterion. The written assessment evaluated in this study clearly promotes a critical and deeper engagement with ethical issues that is valued by respondents.

[Tijdink et al. \(2021\)](#) discuss how a process of checks-and-balances, mentoring, feedback and reflection can allow researchers to engage with ethical issues. The latter is a limitation of the training described in this study, where one respondent (for Q4) said: 'I don't feel it helped me as a researcher as it was not an ongoing training with constant evaluation and feedback'. Although this type of longitudinal activity and support was not carried out in this study, it highlights that ethics training is most effective where it is embedded as part of wider graduate training programmes, and where researchers have the opportunity to reflect on ethical issues and their own research activities through a community of practice. In the view of the author, as a chair of a university REC, changing the 'hearts and minds' of both students and experienced academics on the importance of research ethics is key, and this can only be done with institutional support, which itself is not a given.

## 6. Conclusions and Future Outlook

This study provides an example of the outcomes of research ethics training on researchers at a South African university. Such training is still not conducted globally, and there is limited ethics training in Africa outside of medical contexts ([Ateudjieu et al. 2010](#)). The study highlights the critical role of research ethics training in developing researchers' skills, including the best approaches to project design as well as practical aspects of managing data collection with human participants. Results from this study show that the ethics training produces positive outcomes for all types of researchers, and also highlights the limitations and future opportunities of this ethics training. This may include dealing with specific types of ethical issues for different data collection methods (e.g., in ethnography, or in the use of social media), distinguishing between student and more experienced researchers, and ethical issues in reporting data (e.g., anonymity, confidentiality) or storing data for reuse. In addition, the 2010 Singapore Statement on Research Integrity frames research ethics in a wider context ([Kleinert 2010](#)) and this should also be considered when developing a research ethics training program ([Huybers et al. 2020](#); [Knight 2019](#)).

An important element in Africa, however, is the lack of training capacity ([Ali et al. 2012](#); [Hyder et al. 2013](#); [Ndebele et al. 2014](#)), and this also needs to be addressed in order to provide consistent research training support across the continent. There is also particular concern in Africa regarding issues of academic misconduct, which highlights the need for training in wider research integrity rather than just research ethics alone ([Kombe et al. 2014](#)). The results of this study highlight the importance of research ethics training in researcher development, as well as engendering critical ethical reflection into their research activities. Engagement with and reflection on research ethics issues can lead to better research practices which then, in turn, can result in more satisfying and ethical interactions with research participants and better research outcomes.

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**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Not applicable.

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