

Research Ethics: Researchers Consider How Best to Prevent Misconduct in Research in Malaysian Higher Learning Institutions Through Ethics Education

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Abstract The purpose of this study is to encourage and highlight discussion on how to improve the teaching of research ethics in institutions of higher education in Malaysia. Drawing on semi-structured interviews with 21 academics in a research-intensive university in Malaysia, interviewees agreed on the importance of emphasizing the subject of research ethics among students, as well as academics or researchers. This study reveals that participants felt that there is an urgent need to improve the current awareness and knowledge of issues related to misconduct in research among students and academics. The results of this study indicate a need for better teaching on the subject of research ethics in order to prevent misconduct in research. Finally, it concludes with suggestions that there should be a clear definition of research misconduct, to include consequences when engaging in misconduct; a separate research ethics syllabus for pure and social sciences should be conducted; research ethics should be implemented as a core subject, and there should be an early intervention and continuous learning of research ethics, with an emphasis on ethics training.

Keywords Research ethics · Early intervention · Continuous learning · Malaysia · Core subject · Empowering participants

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Introduction

Research ethics can be defined as the critical study of the moral problems associated with or that arise in the course of pursuing research (Steneck 2006). Teaching research ethics is one of the approaches used to provide researchers with the essential knowledge of how to conduct research responsibly. Education in research ethics can help researchers to obtain a better understanding of ethical standards, policies and issues, and improve ethical judgement and decision-making (Resnik 2015). Many of the deviations that occur in research may happen because researchers simply do not know, or have never thought seriously, about some of the ethical norms of research. Education in research ethics should be able to help researchers to grapple with the ethical dilemmas that they are likely to encounter by introducing them to important concepts, tools, principles and methods that can be useful in resolving these dilemmas, because they often require ethical reflection and deliberation.

Reports on research misconduct frequently emphasize the importance of education in research ethics. The need to implement ethics education in the graduate curriculum, particularly in educating future generations of researchers, has become essential, because misconduct in research compromises the integrity of the research enterprise, and thus threatens the financial, political and social support for research, as well as the autonomy of the academic profession. Richman (2002), Bertolami (2004) and Lewein et al. (2004) argued that the graduate curriculum should incorporate research ethics as a fully integrated element of a scientist's training in order to reduce research misconduct. In South Korea, the discourse in education about research ethics, including the need to implement research ethics education as a part of the formal curriculum, has received much attention, particularly after the Hwang case (Kim and Park 2013). In fact, some universities have even created specific educational programmes to promote research ethics (Oh 2008). Anderson et al. (2007) highlighted the need for training and mentoring to be included in research ethics education because it is one of the best means of ensuring the integrity of research (Anderson et al. 2007). At the same time, different types of research ethics are also suggested for different disciplines, as researchers from varying fields face specific ethical issues or problems that are related to their field (Shin 2008). Therefore, it should cover different topics relevant to the dilemmas most likely to be experienced at each stage of their careers (Rhodes 2002; Sharp 2002).

The Malaysian academic world is not free from research and academic misconduct, although the exact occurrences of such behavior are seldom highlighted by the higher learning institutions themselves. Despite the availability of codes, policies and guidelines regarding conducting research ethically, and stern penalties imposed by universities on researchers who engage in misconduct, the larger questions regarding academic and research misconduct remain unanswered. In 2016, the Malaysian research community was alerted to the incidence of research misconduct by faculty members from one of Malaysia's premier universities. This resulted in the retraction of all four of their publications by the journals

in question (The Star Online 2016). Therefore, this supported Fang's claim that most retractions of scientific publications were closely associated with academic misconduct (Fang et al. 2012). Ataie-Ashtiani (2017) presented a three dimensional world map of scientific misconduct. Malaysia is one of the leading countries in the publication misconduct ladder among the 46 nations with more than 50,000 submitted documents. It is rather alarming that Malaysia was ranked as the second highest among 180 countries worldwide in the misconduct ratio, with 50 articles retracted from 157,198 submissions (Ataie-Ashtiani 2017).

In addition, studies on plagiarism among undergraduate students in Malaysian higher learning institutions indicate that most of the students have a limited understanding of plagiarism and little knowledge of the consequences of engaging in academic or research misconduct (Wan et al. 2011; Mohd Yusof and Masrom 2012; Looi et al. 2015). These findings show the importance of commitment from the university to enforce research integrity among students, as well as members of the faculty, through research ethics education. Currently, research ethics education is not offered as a specialized or core subject in the university curriculum, but instead a component of research ethics is incorporated into other core subjects, such as academic writing or research methodology. Therefore, the effects of research ethics education on students' or researchers' ethical thinking or judgement, when conducting research, is hardly being evaluated.

Previous studies on the impact of research ethics education on researchers' or students' attitude, skills and knowledge of ethics showed that despite gaining a great deal of knowledge from the ethics courses, there is no indication of a change in their attitudes, behaviour or skills regarding ethics (Richman 2002; Lewein et al. 2004; Bertolami 2004; Kalichman and Paik 2004; Rhodes 2002; Sharp 2002). There is no convincing evidence that research ethics education has had any lasting impact on reducing incidents of research misconduct. However, this does not lead to the conclusion that research ethics education is ineffective, unnecessary or unwise (Steneck 2000). Nevertheless, the target outcome such as increasing knowledge regarding rules, regulations and guidelines, skills in ethical decision-making, the ability to resolve conflicts or disputes and positive attitudes about the importance of courses in research ethics are measurable (Plemmons et al. 2006).

There has been limited study regarding research ethics education and how it can improve students' or researchers' knowledge and attitude toward misbehavior that leads to misconduct in research. An understanding of how research ethics education can be improved from the perspectives of academia or researchers is important, because they are the ones expected to carry out research in the most ethical way possible and become an example to their supervisee, mentee or fellow researchers. A study was conducted by Saat et al. (2010) among university students in Malaysian higher learning institutions, which investigated the impact of ethics education on an individual's ethical thinking and judgement. The pre and post study was conducted with two groups of students: those who had attended ethics courses and those who had not. The results showed that students who attended ethics courses, which were conducted for one semester, indicated a significant improvement in terms of their ethical judgement-making ability as compared to those who had not attended any ethics courses.

In another study, educators' perceptions of the current ethics education in Malaysian public universities were investigated (Yin et al. 2014). The study showed that although the educators agreed on the importance of ethics education in the accounting curriculum, their opinions on the adequacy of ethics education's scope were varied. Although surveys of the effects of ethics education on an individual's ethical judgement and perceptions of ethics education in Malaysia are available, the majority of these studies were conducted among accounting and business students, managers or auditors (Zabid and Alsagoff 1993; Gupta and Sulaiman 1996; Abu Bakar et al. 2008; Mamat and Mokhtar 2009).

Ethics education literature in Malaysia is limited, particularly that focusing on research ethics education involving the opinions and views of academia and the research community. Therefore, the purpose of this study is to investigate various methods to teach research ethics education in institutes of higher education, and to highlight their opinions and make suggestions for how to improve research ethics teaching for graduates, postgraduates and researchers in order to strengthen their knowledge of ethics for conducting research. It is hoped that when researchers have strong ethical values, particularly when conducting research, this would prevent the occurrence of research misconduct, as they would know what is correct and incorrect. Additionally, the results will contribute to the limited literature in the area of ethics in a Malaysian setting, and the lack of qualitative research related to perceptions of research ethics teaching in Malaysian higher institutions.

Methodology

In-depth semi-structured interviews were carried out with 21 academics at several research-intensive universities in Malaysia. The interviews lasted between 45 min and 2.5 h and were conducted using the English language. The participants consisted of 21 researchers, who were from different research disciplines, geographical areas and career levels, and had differing numbers of years of conducting and supervising research. There were nine male and twelve female participants. Six of the participants were junior researchers with less than 10 years' experience in research and 15 were senior researchers with more than 25 years' research experience. Nine were from the field of social sciences and humanities, while 12 were from the field of natural sciences.

While formal approval procedures were not required in undertaking this study, in accordance with the standard research protocol, interviewees were provided with a written assurance with respect to confidentiality and anonymity. Permission was also sought to digitally record each interview. A set of the interview question, an informed consent form, and a brief description on research objectives, were sent by email to the selected participants. When they agreed to become a participant, the date, time and venue were decided, based on the participant's availability. The interviews were recorded and handwritten notes were also taken during, or at the end of, each interview. All of the interviews were transcribed and the analysis was conducted with another researcher to compare and define the major findings in order to test their accuracy and validity.

Results

The results from this study showed that all participants except one agreed that research ethics education is able to increase awareness and knowledge regarding research misconduct, and at the same time, help to reduce the occurrence of research misconduct in the institutions. The one participant who felt that ethics education would not have an impact on a person's attitude toward misconduct in research was an anomaly in the study. She argued that knowledge of research ethics education might increase through these classes, but this does not mean that attendees' behavior to misconduct would change, too. She added that the personal desire for prestige and fame outweighs the need to be ethical when conducting research.

However, the interviewees felt that there was a need for change in how research ethics (RE) is currently being taught in their respective institutions. Our findings, which are also the views and opinions of the participants, are categorized into nine themes: definitions, consequences, different types of RE, core subjects, early intervention, continuous teaching of RE, RE training courses, researchers and support staff and empowering potential participants. These are considered below.

Definition

Most participants felt that there should be a proper definition of research misconduct and classification of the behavior that is considered to amount to misconduct in research, so that anyone who is involved in research would know what is and is not considered to be ethical.

I know the university has come out with the definition of plagiarism but I am not sure whether that covers research misconduct as a whole. (P14)

I think the university must come out with an official definition of research misconduct that goes together with the research objective and policy of the university. Right now, I don't even know, what are the university's policies regarding research misconduct. (P15)

I am not so sure whether any of these research policies of the university contain a definition of research misconduct or plagiarism. If not, it should be included in research ethics courses so we, the researchers, will be aware what it is all about. (P13)

Consequences of Misconduct

Participants argued that there is a need to include the consequences of engaging in research misconduct when teaching research ethics. Research ethics classes teach researchers the 'do's and don'ts' of conducting research, but seldom discuss the consequences to researchers who engage in misconduct.

I think research ethics courses/classes should include the consequences for doers, so that they are aware of what's waiting for them if they do engage in misconduct. The course also should include what to do and where to go if we witness misconduct in the laboratory/dept. (P1)

Not only do we need to emphasize the importance of ethics in research, we need to teach them what is right or wrong, and tell them about the consequences of misconduct so when they become researchers they have the values and integrity of researchers. (P11)

Different Types of Research Ethics

Currently, the research ethics education that is used in the curriculum is very general, and it caters for both students of natural and social sciences. However, some participants felt that teaching of research ethics should differ depending on the discipline.

Research ethics should be separate for social sciences and natural sciences. Research ethics for social sciences should be something that can be used by law, education, psychology and other disciplines of social sciences. Coming from a social science background, I would not want to sit in a class for an hour listening to ethical issues unrelated to my field, and I guess it is vice versa for science researchers. (P16)

Research ethics courses/classes/workshops have to be holistic because social science and natural science researchers face different ethical dilemmas in their discipline. (P14)

Core Subject

It is suggested that research ethics should be a core subject, rather than just a sub-subject. This suggestion was made so that there would be more areas and topics or issues that could be included, and a thorough discussion could be carried out on the topic. This enables students or researchers to not only gain knowledge, but also to understand the consequences of engaging in misconduct in research.

Although now we do have classes in research ethics, but it is not a core subject. We have what we call the 'research methodology' subject, for the post-graduate student, and it is here that we teach about research ethics. It should be conducted as formal classes of a core subject. (P1)

Integrity cannot be built using law enforcement because integrity starts with the individual. This is why I think subjects such as research ethics/bioethics are very important. It should be made a compulsory core subject. (P9)

Research ethics should be a component subject or core subject rather than short courses/classes. I found that many research students or even fellow

researchers don't even know how to do referencing correctly, and this leads to plagiarism. (P16)

Early Intervention

Teaching of research ethics should start early, as soon as the student starts their graduate degree, rather than teaching it during their final year, or just before they conduct their own research in their final year.

It can help to improve integrity among researchers and it is better to teach research ethics before they actually conduct research. (P17)

We need to expose our research students as early as possible to research ethics and teach them to adhere to it. (P19)

I strongly believe we need to educate the research students before they even become early career researchers. (P11)

Continuous Teaching of Research Ethics

Education in research ethics should be continuous; from the first time the student registers as a research student up to the time they become a junior researcher. A refresher course in research ethics should also be held from time to time during the year, available to all researchers so they can keep up to date with the current issues and problems related to research ethics and misconduct.

Teaching research ethics has to be on a continuous basis from the first time research students do their degree up until they become senior researchers. (P12)

I advocate the need to teach research ethics and it should be on a continuous basis because as human beings we tend to forget and that should be like a reminder. (P15)

Teaching research ethics can help to improve integrity among researchers and we need to have the courses/classes on a regular basis like a refresher ethics course for all researchers. (P18)

Research ethics courses should include junior and senior researchers. For the junior researcher, this course will empower them with the essential knowledge of how to conduct research responsibly. As for the senior researcher, it would be like a refresher course and embrace the latest issues in ethics and misconduct. You know, some of these senior researchers have not conducted research for a very long time because of their commitments with other tasks like teaching, consultation, etc. So, research ethics courses would be good for them. (P19)

Research Ethics Training Course

Training is an important aspect that should be incorporated into research ethics education to prepare research students or early career researchers with the necessary skills and knowledge for situations where they need to make ethical decisions.

It is also important to have ethics training for all researchers regardless of whether they are junior or senior researchers. (P4)

Ethics training should not only be for researchers, but should include support staff because they also should know what is right and wrong, so that they will also understand why it is wrong/right. (P13)

Research Ethics for Researchers and Support Staff

The participants felt that research ethics education must include support staff, because most of the time they assist researchers in all other aspects of research. Therefore, it is important for them to know what is and what is not, research misconduct.

The courses should be for anyone who is directly or indirectly involved in research. (P15)

I think teaching research ethics is important to increase research integrity awareness among researchers. However, I feel that research ethics should also include support staff so that they know what should and shouldn't be done. When you explain to them that it is wrong and what not, at least then they would know and understand why. (P13)

Empowering Potential Participants

Only one participant mentioned that research ethics education should include teaching researchers about how to educate society on the ethics of conducting research. In that way, researchers can empower potential participants to conduct research responsibly.

We need to empower people or members of society who are potential research participants with knowledge of their rights and how to recognize research misconduct, and how and where to report it. In this way, we can prevent research misconduct and prevent these potential participants from being manipulated and abused by irresponsible researchers. (P20)

Discussion

Ataie-Ashtiani (2017) strongly emphasized the need to enforce research integrity after his alarming findings that researchers in 180 countries worldwide were engaging in research misconduct. He reported that 4960 articles were retracted from 19,967,965 accepted publications between 2011 and 15 March 2017. Malaysia was

among the top countries involved in publication misconduct, with a number two ranking in the misconduct scale and 50 retracted articles out of 157,198 submitted publications.

Considering the worrying number of incidents of research misconduct, there is really an urgent need to look at intervention. Our findings suggest that teaching of research ethics would be able to create awareness among researchers and students, and educate them about how to conduct research responsibly, to make ethical decisions in a given situation, provide them with the capability to differentiate between correct and incorrect actions when facing ethical conflicts, and update researchers about current ethical issues and problems. These views concurred with previous studies conducted on the positive consequences of research ethics education to a researcher's career, understanding of ethics when conducting research and prevention of engaging in research misconduct (Mumford et al. 2008). The findings also revealed that it is necessary to improve the current teaching of research ethics in Malaysian institutions of higher learning in order to equip both undergraduate and postgraduate students, who would be future researchers, with the right knowledge and skills, and thus, avoid in engaging in research misconduct.

One of the suggestions is that research ethics teaching should include a clear and thorough definition of research misconduct, as well as the university's policies and guidelines on conducting research ethically. Some of the participants were aware of the existence of university policies and guidelines regarding research misconduct, but unfortunately, some were clueless as to whether such policies existed or not. This highlights the role of institutions to inform their faculty members regarding the university's research policies and guidelines, particularly on issues related to 'questionable research practices'. According to Ana et al. (2013), questionable research practices include publishing pieces of research more than once, failing to declare conflicts of interest, excluding outlying data without disclosure (selective reporting), including within a paper an author who has contributed little or nothing, and many other things. At the second world conference on research integrity in Singapore (2010), irresponsible research practices, which are the same as questionable research practices, were also highlighted as part of research misconduct, and should be reported.

Another interesting finding from our study is that the majority of interviewees expressed the importance of including the consequences of engaging in research misconduct in ethics teaching. This would include the penalties when engaging in misconduct and the long-term impact of engaging in misconduct to their career as a researcher. This is because teaching of research ethics seldom involves an explanation of the consequences of engaging in research misconduct to researcher's professional career and personal integrity within the research community circle. Knowing the possible negative consequences of misconduct may have a positive impact on a researcher's decisions in terms of not engaging in misconduct. According to Davis and Riske-Morris (2007), it is reasonable to acquaint the large number of new scientists with research norms, as well as the consequences of their violation, early in their training programme.

Different types of research ethics according to research disciplines might increase students' or researchers' interest in the subject. This was highlighted by

the interviewees in their discussion, because researchers or research students from the social sciences face different types of ethical dilemmas as compared to natural or medical science researchers. A similar point was also highlighted by Kim and Park (2013), who found that some scholars preferred to maintain different types of research ethics for different disciplines. For instance, individuals from the social sciences and the humanities were more interested in plagiarism and duplicate publications, whereas researchers in biology were more concerned about the ethics related to using human and animal subjects (Kang et al. 2007; Shin 2008).

Most interviewees suggested that research ethics should be a core subject rather than a sub-subject in the university curriculum. A similar suggestion was also mentioned by some scholars in South Korea in the aftermath of the Hwang case (Kim and Park 2013). Spending more hours on the subject would enable in-depth discussion, which could help students to understand the need to conduct research ethically, how to analyse ethical situations whether inside or outside the university or their research discipline, and what they should do when witnessing misconduct. In most developed countries, research ethics courses are well established as a core subject in the university curricula, and they have been found to contribute to increasing knowledge and awareness regarding research misconduct (Chen 2003). Although the relationship between research ethics and the occurrence of research misconduct is still unclear, there is no doubt that teaching research ethics could provide researchers with the necessary tools to evaluate ethical conflicts and make ethical decisions based on their knowledge.

Early intervention with regard to research misconduct might be able to lessen the occurrence of researchers engaging in misconduct in research. Interviewees felt that research ethics education should be taught before the research students conduct their own research in their final degree year. Miller (2010) supported the need to have early 'intervention' to prevent research misconduct, because cases of misconduct in which the main actors are young researchers or students usually draw even greater attention from the research community, as it raises questions related to training and responsibility within institutions. With the increasing number of postgraduate students each year, there will be an increasing amount of research conducted and, consequently, the likelihood of misconduct increases (Mitchell and Carroll 2008). However, early intervention might not be enough, because as researchers progress in their research careers, ethical issues also evolve. Therefore, this highlights the need to have continuous research ethics courses to update researchers with new technology developments, which bring about new ethical conflicts. Eisen and Berry (2002) made a similar suggestion. They argued that continuing education in research ethics should become an integral part of the life of practising scientists. Activities oriented toward researchers at early stages of their careers have the highest prospects of providing long-term benefits to society and developing systems acknowledging principles of responsible research and innovation (Krstic 2015).

Anderson et al. (2013) argued that on-going training is important throughout researchers' careers, as rules and policies are updated and new technologies give rise to new ethical complications. Actually, for most universities across the globe, training of researchers starts when they are still students, both at the undergraduate and post-graduate level. However, for some, ethics training is taught unofficially through hands-on

experience as part of their mentor–mentee relationship (Jordan and Gray 2012). This is similar to our finding that most participants felt that many researchers, particularly senior researchers, do not have any proper ethics training, but they have learned about the ethics of conducting research through the example of observing their mentor or colleagues. Therefore, this supports the need to incorporate training in ethics education to connect between theory and practices. According to a study by Kristic (2014), among early career researchers, a majority of the respondents (approximately 63%) expressed a clear motivation for training or learning more about issues related to research ethics and integrity. This offers an antecedent method of thinking, with the aim of making subsequent formal courses in ethics more intelligible and more relevant, letting students decide for themselves whether what they have been taught fits with their own personal conception of an ethical life (Bertolami 2004).

One result of potential concern in this study is the lack of knowledge among support staff who are also involved in managing research. This highlights the urgent need to include them in research ethics education. Citing her own experience, one participant shared that she had witnessed the identity of a whistle-blower unethically revealed by some staff who were handling the complaint. This is a very disturbing finding, highlighting the case that these committees have to deal with ethical issues and problems, as well as make ethical decisions regarding the issues. Therefore, this raises questions regarding the credibility of the ethics committee to handle ethical issues, the need to protect the identity of whistle-blowers and to make ethical decisions. A similar concern was raised previously by Hoffman et al. (2000) who mentioned that a significant amount of discussion in the bioethics community has been devoted to the question of whether individuals performing ethics consultations or serving on an ethics committee in healthcare or research institutions have any special expertise.

Research ethics education is always focused on researchers and what they should and should not do in order to conduct research ethically and responsibly, but it seldom touches on the issue of empowering society or future study participants. Empowering society with knowledge about research ethics and misconduct was a concern among the interviewees. The history of research involving public participation, such as the infamous Tuskegee syphilis study (Loue 2000) and the notorious research involving children with mental retardation in Willowbrook State Hospital in Staten Island, New York (Shamoo and Resnik 2009), demonstrates how groups of researchers manipulated and took advantage of a vulnerable population, in order to recruit potential participants for their study. Educating the potential participants about research ethics and misconduct would not only protect them from being misused by irresponsible parties, but would also help to reduce misconduct by researchers by providing a voice to the respective parties.

Conclusion

The findings of this study highlight the importance of research ethics education to students, researchers and support staff. There is no doubt that educating members of the faculty about ethical methods of conducting research could prevent them from

engaging in research misconduct. Currently, the subject of research ethics is being taught in most universities in Malaysia with the intention to create awareness and increase students' and researchers' knowledge regarding ethics and misconduct. However, in order to make the teaching of research ethics have a greater impact, our participants felt that there is a need to improve the way research ethics is taught. It is suggested that there should be a clear definition of research misconduct and unethical research practices, so that these can be avoided. Research ethics education should include the consequences of engaging in research misconduct upon researchers' careers, so it will be clear to them what will happen if they decide to engage in misconduct. There should be a separate curriculum for research ethics education for natural and social sciences, since the ethical issues faced by researchers from both fields might differ. Research ethics should be a core subject instead of just a small topic within a subject, and research ethics education should be implemented at an early stage before students are allowed to conduct their own research. At the same time, continuous teaching of research ethics is also suggested, because ethical issues are evolving and researchers must update themselves with the current ethical issues. Research ethics training courses were also highlighted by participants to be incorporated into research ethics education. There is also the need to empower members of the public with knowledge about research ethics, because they are the potential research participants. It is our hope that this result could lead to greater and more extensive research on research ethics education in Malaysian universities, in order to increase awareness and knowledge about research misconduct among the academic community.

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Compliance with Ethical Standards

Conflict of interest The author(s) declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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