

ENGG7811 Research Methods

Assignment 1

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Question 1. Conflicts of Interest

(a). Conflicts of interest are an important issue in academic research industry. It might influence the objectivity and credibility of the research thesis. Generally, if any personnels that involves the research has any others external interest, relationships, factors that are not related to the research context itself, then we could say the conflicts of interests may occur. Basically, conflicts of interest are separated into four common types:

1. Personal, which means the relationship with the partner, it may be families, friends, or co-works...etc.
2. Professional, which means the past cooperation or supervisions with someone.
3. Scholarly, a person may have several particular prospectives, tendencies or ideas on specific issues.
4. Financial, some potential economy benefits.

All of them would influence the objectivity and credibility of a research if someone has at least one of these factors.

A common example of Col is that if a doctor plan to publish a positive research thesis that is related to the company he works, then there would be some doubts emerge because it would profit his company and eventually profit himself.

(b). By increasing the transparency, the situation of conflicts of interest at the site of research personnels could be declined, so that the trust between the research personnels and stakeholders could be enhanced as well. Transparency could be improved by achieving the following:

1. Public Disclosure: Transparency means that the researchers and institutions need to publicly disclose possible conflicts of interest.
2. Communication to stakeholders: Transparency should be done by regular, clear communication with stakeholder, which means the site of research personnels should share

the information about CoIs to stakeholders and deliver the solutions about how to increase the objectivity and credibility caused by CoIs.

3. Research policies and processes: The institutions of research should formulate a clear, restrict policies or researchers to follow to ensure the research process and outcome be fair and open.

4. Monitoring: A specific committee should be created to monitor the research. The person in this committee should also be independent outside the research, so that they could properly monitor the research.

(c). A classic situation of conflict of interest that might arise in financial transactions with respect to research is that the research is sponsored by several particular commercial companies, or the researchers may hold the stocks or bonds of that financial institution. The CoIs would occur because the researchers may want the company to operate flourishingly to eventually benefit themselves. By implementing the methods of increasing the transparency mentioned at (b), the researchers could do the following:

1. Publicly disclose the financial relationship between research institution and the financial company, such as sponsorships, stock and bonds holdings.

2. Follow all policies that already been formulated by the research institution, ensure the research process are fair and open.

3. Passing the independent review process to ensure the objectivity and credibility of research results are not affected by CoIs.

(d). The potential solutions I mentioned above are how to decline the CoIs, however, there is another more convenient and even more doubtless way is that just avoid the CoIs. It is called averting suspicion, if the CoIs related committee found out some of the personnel may have CoIs to the research, just reject them to participate the research. Furthermore, educating the employees the knowledge about CoIs could offer alternative, not every employee in a institution is fully familiar about CoIs, therefore, offering them opportunity to learn about CoIs is important, so that they could know how to decrease, manage the CoIs, or even judging whether they have CoIs of particular project, if they have CoIs to a project, they could choose not to join before it starts.

(e). Actual CoIs: Actual conflict arises when a person or his actions, decisions, or interests are directly affected to a specific interest. This kind of CoIs could result in a negative impact on the objectivity, fairness, and credibility of research, decision making...etc.

Appearance CoIs: Appearance CoIs is potential conflicts of interest which exists, but these conflicts may not directly affect the actions, decisions, or interests of a person. This kind of

Appearance Cols also may not influence the objectivity, fairness, and credibility of research as well.

As mentioned, Cols is an important issue in research industry, the research result would likely to be used to improve some technologies or in other fields. As a result, the outcomes should always be strongly objective and fair, yet Cols is a component that would decrease these features of research. Therefore, the inside personnels should struggle to minimise the Cols in research industries. There are several approaches for researchers to eliminate Cols, such as public disclosure, communication, formulating policies and process, and monitoring.

Question 2. Quality metrics for journals and journal articles

(a). For reference styles IEEE and APA, the main difference between them is IEEE reference format use number into a square bracket in in-text citation, while APA format use superscripts, just like others traditional reference method. In terms of references in references list of these two styles in question context, IEEE one would need to clearly show the number in in-text citation, while APA only need to write down reference information directly. In addition, the orders of showing published date and pages are different as well.

Example of an in-text citation of two reference style:

IEEE: [1] Y. LeCun, Y. Bengio, and G. Hinton, "Deep learning," *Nature*, vol. 521, no. 7553, pp. 436–444, May 2015, doi: 10.1038/nature14539.

APA: LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436–444. <https://doi.org/10.1038/nature14539>.

(b). Scopus: h5-index = 28 from Scopus accessed on 19/3/2024.

Google scholar: h5-index = 73 from Google scholar accessed on 19/3/2024.

WoS: h5-index = 36 from WoS accessed on 19/3/2024.

There are many reasons why each website will have different h-index data. The main reason is the data resource to calculate h-index on each website are different. For example, the h-index data of Scopus comes from the calculation of the number of articles cited from Scopus, while the index data of Google Scholar comes from the calculation of the number of articles cited from Google Scholar. Each website receives a different amount and does not share then, hence the h-index will be different on different websites.

(c). JIF is an important metric in academic industry. It is determined by calculating the average number of citations per article in this journal in the past two years. This simple and intuitive technique could provide a clear reflection of a journal's impact and value. The article mentioned in the question is included in the journal names "International Journal of Computer Vision", its 2022 JIF score is 19.5. This means that each article in this journal has

been cited an average of 19.5 times in the past two years. This is a pretty good score, which greatly reflects the academic influence of this journal.

Question 3.

An article usually has several authors, and it is important to understand the backgrounds of these authors and the relationships between them. For example, in Q2 second article. The author team of this article has totally 6 people. And their responsibilities in the article are clearly divided. Dr. Ramprasaath R. Selvaraju is a scientist at Salesforce Research. Dr. Michael Cogswell is a scientist at SRI International's Center for Vision Technologies. Dr. Das. Abhishek is a financier in applications of supervised machine learning. Dr. Vedantam, Ramakrishna and Parikh, Devi is an expert in machine learning and AI, and Dr. Dhruv Batra is a director in leading the Embodied AI. As a result, this article is a professional research paper covering many majors. Finally, the corresponding authors of this article are Dr. Selvaraju and Dr. Ramakrishna.

Question 4.

(a). Medical experiment always is a controversial issue in research field, it could conduct plenty of significant advantages, whereas the disadvantages could be evident as well. The advantages are that when participants (usually are patients) are studied and conclusion is delivered, the result could be strongly beneficial to human, such as improving the situation of other patients who also under the same condition with them, increasing the efficiency of nursing, or even inventing a new medicine to cure such illness. The main drawback is that when an experiment like this is conducting, collecting patients' personal data often violates research integrity. For instance, in order to better study the actual situation of patients, it is usual for researchers to conceal the experiment from them, or use inappropriate methods to collect, analyze, and use their body data...etc. Furthermore, the experiment data and results sometimes would be improperly used as well since it should always be protected firmly. These issues are usually led to two polarize options. According to Hippocratic Oath, the critical point of medical ethics is patients' confidentiality, informed consent, and to maximise patients interests and minimize patients risks simultaneously. Therefore, I believe that when conducting experiment on patients, it is essential to inform them about the processes and purposes about the whole experiment and obtain their agree. In addition, it is equally important to protect their experiment data and results. Anyone who is not related to the experiment should never access the patients' information, unless they sponsored the experiment, then the issue of co-sharing the experiment data and results should also be taken into account.

(b). Delete some of the unexpected data in model developing is not reach the research ethics even could be seen as research misconduct because after deleting the unexpected data would mean the experiment could not reflect the actual situation. When researchers encounter this situation, the first thing is to evaluate the reasons of it. If the situation occurs because

measuring mistake or research failure, researchers could delete the data and begin a new one. However, if the unexpected could not be blame on any reason, then the research should struggle to fix the problem, not just only delete this piece of unexpected data.

(c). Academic ethics can be said to a cornerstone of the research field. Generally, it ensures the quality of research. Specifically, academic ethics can protect experimental participants and ensure the fairness, credibility, and objectivity of experiments. Additionally, the following of the rules ensure the experiment is reasonable and logical. I think these factors are indispensable for producing a good academic result, which can make human life more progressive.

Question 5.

(a). Conference ranking plays a vital role in measuring the quality of a conference. Basically, it is ranked based on the citation rate of its results, the rate of theses output, the reputation of the participants, and their research records. Conference ranking is roughly divided into A* level, A level, B level, and other levels. The A* rank indicates that this flagship conference is a leader position in this industry. An A grade represents a conference that is nearly perfect and highly respected in the industry. B-level conferences are good conferences. Although they are not as respected as A* or A-level conferences, they still own a certain amount of attention in related industries. Therefore, I think using conference ranking is a quick and intuitive metric to measure the quality of a conference. By learning from conferences rated B and above, it can help researchers plan a new conference with better quality.

(b). According to the related database [1], the FoR code for Association for Computation Linguistics in 2017 and 2018 is 0801, while 2019 is not recorded by the database, and for 2020 and 2021 is 4602. In terms of IADIS International Conference Applied Computing, FoR code for 2017 to 2019 is not recorded, but for 2020 and 2021 the FoR code is 4601.

References:

- 1 The Computing Research and Education Association of Australasia, CORE Inc., 2023, "ICORE Conference Portal," The Computing Research and Education Association of Australasia, CORE Inc.. [Online]. Available: <https://portal.core.edu.au/conf-ranks/?search=4601&by=all&source=CORE2023&sort=atitle&page=1>