

Review of: "Planning Courses on Ethics in Engineering Curricula"

Kindu Ayecheaw Ayenalem¹

¹ Gondar University

Potential competing interests: No potential competing interests to declare.

Planning Courses on Ethics in Engineering Curricula

Thanikachalam Vedhathiri¹

I want to start by thanking the author for his meticulous efforts in coming up with a topic that is both important and topical. Studies on professional ethics in any subject are extremely important in today's fast-paced, highly globalized world. Professional ethics for engineers may be just as crucial in the field of engineering as they are for doctors, teachers, and lawyers, in my opinion. In this sense, it is commendable that the researcher tried to investigate the viability of integrating an ethical course into engineering curriculum. Although the paper offers insightful information on the subject, I believe that there are some flaws that should be considered in order to enhance the paper's quality.

My concerns and comments are organized as presented below

1. Title, Abstract and Introduction

A. **Title:** for clarity purpose, the title needs minor reconsideration. *Planning Courses on Ethics in Engineering Curricula*. The title does not directly convey the intention of the author. It can be modified as:

- I. **Planning ethics courses in engineering curricula, or**
- II. **Integration of ethics courses within engineering curricula, or**
- III. **Planning the integration of ethics courses in engineering curricula**

The proposed titles are clearer than the one proposed by the author. In proposing so, my intention is not enforcing the author to take my suggestions but rather to emphasize that the research topic needs a bit clarity in a way that the author can do so.

A. **Abstract:** The overall organization of the abstract section is somewhat good. However it needs some reconsiderations:

- Lines 1-3, comprises statements taken from the review literature. Such types of expressions are not so important in organizing precise and informative abstract.
- In the following statement read
as: ***In this paper, the need for ethics, the process of incorporating it into an engineering curriculum, and implementing it is presented based on the feedback from 76 senior faculty members from the southern region of India through case studies, and analysis.***

Information is provided about: (1) objectives of the study, (2) research participants, (3) design of the study and data analysis

However, the statement is not clear for readers. For example, in which type of data collection instrument do participants provide their feedback (questionnaire, interview or both)? What was the employed data analysis technique? What was the design of the study? Is it case study? All such questions insist the need to clarifying the abstract section.

- Finally I do not observe the findings and conclusion in the abstract section If possible, incorporating them in the abstract section is very vital to convey sound information for readers at glance.
- **C. Introduction:** I notice that the introduction section has some major flaws:
- **The organization of the introduction section is full of disconnected sentences and/or paragraphs** That is, it lacks coherent flow of the ideas. For example, let me show some sentences:

- a. Engineering is the process of developing an efficient mechanism that quickens and eases the work using limited resources with help of technology (line 1).
- b. Ethics are the principles accepted by society, which also equate to the moral standards of human beings (line 2).
- c. Every engineer with ethics should help society in a better way (line 3)
- d. Some of the moral codes are being good to citizens, communicating only the truth, going against wrong principles, having chastity, and never cheating. (lines 3-5)
- e. Engineers are vital to shaping our world. (Line 5) The sentence in (a) is about what engineering is and its uses.

The sentence in (b) is about what ethics are in general.

The sentence in (c) is about the obligations of ethical engineers to serve their society

The sentence in (d) is about some of the ethical principles expected from engineers

The sentence in (e) is about the role of engineers.

My concern is none of those fragmented sentences provide clear meaning for readers It would be better if the introduction section is organized in a way that it can provide comprehensive and coherent understanding for readers who might have questioned as:

- What are ethics in general and professional ethics in particular?
- Who engineers are and how professional ethics is essential for them?
- What types of ethical principles are expected to be adhered by engineers?
- What the current practice looks like in the field (if any)
- What is the rational of the study (felt gap for this research)

II. The rational or gap of the study is not clearly stated Why it is so urgent to investigate integration or planning of ethics courses in engineering curricula? (I think, points discussed under **1.1 and 1.2 as Current and Desired Scenario** cab merged and discussed broadly to show the rational of the study)

III. The argument in the introduction section is not well-supported by empirical evidences. (*Only three inappropriately cited sources were used in the introduction section*). Examples to show the inconsistency citation of sources:

- Every engineer with ethics should help society in a better way (Tutorial point.com) (line 3)
- As such, engineers need to hold themselves to a high professional standard. Ethical issues that exist in engineering have to be improved (Esther Han, 2023). (lines 7-8)
- Ethics is based on well-founded standards of right and wrong that prescribe what engineers ought to do, usually in terms of rights, obligations, benefits to society, fairness, or specific virtues (Manuel Velasquez, et al. Year????). (Lines 17-18)

Those problems are also occurred in the review literature section.

2. Objectives: the objectives are relatively well-stated but wrongly placed. They have to be placed right after the introduction section than at the end of the review literature. Because, objectives/questions are the direct reflections of the rational of the study.

3. Review literature: The points raised in the review literature section are somewhat good. However, I observe some problems that needs modifications. The review section lacks comprehensiveness and is unsupported. It does not show the author's position of the issue. In seated it is a mere collection of ideas from different sources (in that X do that ...Y...do this and D state that...). That is it lacks the comprehensive summery of the researcher's intention using those sources. The problems related to **in text citation** and **use of adequate empirical evidences** are so obvious.

4. Methodology/Materials and Methods: The method section is more or less sound. Nevertheless, there are some major flaws that need to be corrected or justified.

- What specific design was employed in the study? (In the abstract section, I read a word case study, but I never find it in the methodology section). What was the approach of the study (quantitative or qualitative, or both)? In 4.1 the researcher includes 10 open ended questions that seems to be sued as interview guides. But, in 4.4 the author told us that the participants' feedback was obtained using four point Likert scale items. Implicitly, it seems that the author employed questionnaire. Again when one looks at Table 2, the items incorporated in it are based on four point Likert scale and those presented in 4.1 as open ended interview guides. How very complicated to understand! So, it is better if the author provides evidence on the design and approach of the study, type of data collection instrument/s, if possible along with their preparation, validity and reliability issues.
- In the methodology section, page 7, under 4.1. Says **research questions**. As I discussed so far, this section comprises list of ten open-ended items but again presented as questionnaire items in table 2. Besides to the stated controversy, the phrase presented in 4.1 wrong in two cases: first what does it mean when the researcher says **research question?** Does it mean the **research questions** that he want to answer at the end of his investigation, or the interview/questionnaire items that he used to collect data from participants? If the case is the second one (of course it seems), the second problems occurs, that is, list of questionnaire/interview guide items should not be presented as part of the main paper/manuscript. Instead they can be provided as annexes.
- Similarly in the methodology section, the author stated that:

The research methodology is based on open thesocial science model, collecting information from the participants (faculty members and students). Analyze the feedback and comparing with the standards of law, rules, and natural justice. Preparing suitable models on including ethics in engineering curricula and validating them throughaset of experienced senior engineers and engineering educators.

For the ideas in the above paragraph, my concerns are: (1) what does it mean open social science model? How it fits to this particular study? (2) Was data collected from students? Were students participant of the study? How the students were sampled? I never find information for such and other question in the paper except that the statement in which the author told us that he collected information from the participants (both faculty members and students) (*see the author' paragraph above, line 2*) (3) How the participants' feedback was analyzed and comparing with the standards of law, rules, and natural justice? What were those standards of law, rules, and natural justice? (*Within the same paragraph above, see lines 2-3*). (4) How the suitable models on including ethics in engineering curricula were prepared? Who prepared them? Why validating the prepared models was essential?

Since the methodology section is the heart of any study, it is better if the author provides clear and adequate information for the

questions that I raised above. The information on those questions is very crucial to give lessons both for readers and other researchers who need to follow the same procedure/s.

- Under 4.2, population of the study the author used one phrase that needs clarity. **Middle-level faculty members** (senior assistant professors, associate professors, and professors)....

How the combination of those three groups (that is, senior assistant professors, associate professors, and professors) can be grouped as middle level? They are seniors but under middle level. There are full professors, but under middle level category. Some of them are from deemed and technical universities of the country but yet under the middle level group. This might be ok for the author as he knows the context very well. My concern is, it is better if the **author provides footnote on why and how such classification is in India for clarity to the readers?** Right?

5. Findings/Data Analysis: I noted major mistakes in the data analysis/finding section. First, the author proposed three research objectives at the outset. While he presented the data analysis, research objective one is presented aligned with the methodology section, under 4.4; whereas the remaining two objectives were presented under sections 5, 5.1, 5.2, and so on. Second, the researcher made a discussion under 4.6 for the first research objective, but there is no discussion for the remaining two research objectives. Hence, the data analysis section needs the attention of the author to correct those two major and other problems.

6. Interpretation/Discussion: The author does not provide a comprehensive and focused discussion on the findings based on the research objectives. (See the problems that I mentioned in point 5).

7. Conclusions and recommendations: The conclusion and recommendation sections are not sound enough. The 10 points listed in the “name of conclusion” are mere repetition of the data in table 3. What one needs in the conclusion section is the implication of the study either for policy or practice, or both. It is not summary of data in the table. Similar problem is observed in the recommendation. Based on the finding and the conclusion made, who is recommended to...do what and how, now and in the future? This is expected from sound recommendation. However, I did not find such types of recommendation remarks in the paper.

8. References: referencing and in text citation needs due attention to avoid inadequacy, improper and inconsistency utilizations. They have to be corrected in line with a specific referencing and citation rules of a journal or guidelines.

9. Compliance with Ethical Standards: I do not observe any ethical procedure or action employed by the researcher. It would have been better if the author includes some commonly known ethical procedures employed in social science researches.

10. Writing/language issues: The paper will be much benefited if the author consider some errors (wrong inclusion of data collection items/questions as the main part of the paper, lack of coherence for ideas and paragraphs, poor organization the result and other sections of the paper)

11. Overall comment to the author: Dear author, I would like to thank you again for your valuable research work. As I emphasized at the beginning of my comment, you come up with a very important research agenda, **planning the integration of ethics courses in engineering curricula**. The result might have sound implications for policy and practice in the engineering field. Despite the efforts that you invest on the study to do so, your work lacks some rigorous and appropriate procedures expected from research. It lacks a bit clarity. In other words, some sections are open for controversy and greater confusion. You can look at the details above in my 10 points. Any ways, your work will be improved more and benefited too if you consider my concerns and comments keenly.

Thank you once again and I wish you good luck!

