Qeios

Peer Review

Review of: "Algorithm for Planning Flexible Outcome-Based Engineering Curricula to Meet the Employee Needs of a Cluster of Companies"

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Title: Algorithm for Planning Flexible Outcome-Based Engineering Curricula to Meet the Employee Needs of a Cluster of Companies Review and Critique

Introduction

The historical context provided regarding globalization in India since 1991 offers an intriguing foundation for this study. However, the section would benefit from further unpacking of critical terms and concepts to ensure clarity for readers unfamiliar with the Indian education system or its engineering colleges. For example, the term "self-financing colleges" should be elaborated upon, particularly regarding their undergraduate curricula, governance structures, and delivery mechanisms. How do these colleges integrate with or differ from traditional engineering institutions in India? Similarly, the term "traditional curriculum" requires clarification. What specific elements or characteristics define this curriculum in the context of engineering education in India?

The sentence: “In the last ten years, more than 1000 engineering colleges were closed for want of applicants. Since most companies demand industry-ready graduates with outstanding competencies in analysis, design, product development, and manufacturing, these colleges could not improve their programs,” should be rephrased for better coherence and flow. Additionally, citations and references are necessary to substantiate these claims.

The first paragraph could be rearranged to narrate a more coherent sequence of events linking globalization in India to the evolving challenges in engineering curricula and workforce demands. After establishing this historical context, the research gap needs to be articulated explicitly. What specific issue or gap does this study address? For instance, while the paper mentions the need for case studies, a prior discussion of existing studies in engineering education and their limitations would provide a stronger rationale for this research. Highlighting a clear gap—such as a lack of contextual or empirical data—would strengthen the case for the study's necessity.

Finally, the last five paragraphs, starting with "Cluster of Companies that Recruit One Degree Holder with Different Skill Clusters," seem misplaced in the Introduction. Their relevance to this section needs clarification, or they should be integrated into a more appropriate section of the paper.

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Literature Survey

The Literature Survey section provides a valuable list of relevant studies, but its purpose should be more explicitly tied to the paper's rationale and research gaps. Each referenced study should connect to the themes and objectives of this paper, synthesizing insights to justify the need for the current research. For example, what specific problems in engineering education or curriculum planning do these studies highlight, and how does this paper aim to address them? Without these connections, the section risks becoming a mere summary of previous work rather than a foundation for the current study.

Additionally, including more citations and discussions of related studies can further reinforce the paper’s claims and rationale. The "Inferences" subsection would benefit from context and explanation—what are these inferences, and why are they significant to the study? Clarifying their purpose would improve the coherence of this section.

Statement of the Problem

The first paragraph requires proper citations to support its claims. Furthermore, a brief introduction explaining the relevance of the quoted material to the paper would enhance its clarity and purpose. (Note: Correct the term "MOOCs" to "massive," not "mass.")

The six objectives outlined in this section are ambitious and relevant to engineering education, but their scope appears too broad to be realistically addressed in one study. Narrowing the focus by revisiting the research gap identified in the Introduction would allow for more precise and achievable objectives. Each objective should be accompanied by a rationale, explaining its relevance and connection to the research questions.

Research Methodology

This section requires a detailed overview of the research design and framework. It should describe the case study approach and its relevance to this research. What makes the case study method suitable for investigating the proposed algorithm? Additionally, the section should outline the data collection and analysis methods clearly.

Population

Descriptions of the study's population are critical to its validity. This section should explain why specific groups were chosen, what data were collected, and how these data were gathered. Information on the instruments used (and whether they were validated) is also essential. The bullet points spanning pages 2–10 should be synthesized into a narrative discussion. Presenting the data through thematic analysis aligned with the research objectives, accompanied by visual representations (graphs, tables, charts), would enhance the section’s organization and impact.

Discussion and Conclusion

This section should focus on the study's key findings and their implications concerning the research objectives and questions. Highlighting themes and discussing the broader implications for engineering education would strengthen the paper's contribution to the field.

Sections 5.1 - 5.2 These sections should explicitly address the study's limitations, including potential biases in data collection and analysis. Discussing these limitations would provide a balanced perspective on the study’s findings and reinforce its credibility.

Synthesis for the Author

Your paper addresses an important issue in engineering education by proposing an algorithm to align flexible, outcome-based curricula with the needs of industry clusters. However, several areas need improvement to enhance clarity, coherence, and impact:

1. Introduction: Expand on critical terms (e.g., "self-financing colleges" and "traditional curriculum") to provide context for an international audience. Reorganize the section to present a clear historical progression and establish a specific research gap. Relocate or justify the relevance of the last five paragraphs in this section.

2. Literature Survey: While you reference relevant studies, synthesize them to explicitly connect with your research objectives. Highlight key themes and gaps in the literature to position your study effectively. Clarify the purpose of the "Inferences" subsection.

3. Statement of the Problem: Refine the six objectives to focus on a more manageable scope. Link them to clearly articulated research gaps and provide rationale and justification for their inclusion.

4. Research Methodology and Population: Provide a detailed discussion of the case study design, data collection methods, and population rationale. Synthesize the data into thematic results, supported by visual representations (e.g., graphs, tables) and in-depth analysis.

5. Discussion and Conclusion: Focus on key findings, their implications for engineering education, and how they address the research objectives. Include a balanced discussion of methodological limitations.

I believe that addressing these recommendations will strengthen the paper's contribution to the field and improve its clarity and coherence for a broader audience. The paper has potential but requires very significant revision to improve its clarity, coherence, and alignment with research objectives. These changes will enhance its impact and suitability for publication.

Declarations

Potential competing interests: No potential competing interests to declare.