EDUCATION FOR CHEMICAL ENGINEERS
Publication of the Institution of Chemical Engineers

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DESCRIPTION

Education for Chemical Engineers was launched in 2006 with a remit to publish education research papers, resource reviews and teaching and learning notes. ECE is targeted at chemical engineering academics and educators, discussing the ongoing changes and development in chemical engineering education.

This international title publishes papers from around the world, creating a global network of chemical engineering academics. Papers demonstrating how educational research results can be applied to chemical engineering education are particularly welcome, as are the accounts of research work that brings new perspectives to established principles, highlighting unsolved problems or indicating direction for future research relevant to chemical engineering education.

Core topic areas: Accreditation Active methods of teaching Assessment Benchmarking Blended pedagogy Curriculum development and transformation Design of process / product teachingDigitalisation Distance education Diversity Employability skills Entrepreneurship programs Immersive teaching methodologies Industry-academic linkages Lifelong learning Multidisciplinary programs New pedagogical technology Practicals and virtual laboratories Problem-based learning Simulation tools in education Social responsibility and professionalism Student recruitment and retention and transition programs Web-based learning

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GUIDE FOR AUTHORS

INTRODUCTION
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Types of Paper
The journal publishes three different kinds of papers:

Example of Good Practice

Technical content and design context e.g. pump sizing examples for slurry flow, or for high turndown design, or for pump placement in cross country pipelines to avoid dropping below NPSH.

A survey of design teaching and instruction perceptions of maximum group size etc across a number of instructors.

Papers of this type should include the following features:

- **Overview of issues and literature** - a brief overview of the issues concerned (content with pedagogical relevance) and of the current literature on these issues.

- **Overview of problem** - an overview of alternative approaches to the problem addressed in your contribution and their relative merits and disadvantages compared to your approach (wherever possible, these should be quantified). This includes problems with design content that are open ended in nature.

- **Discussion of implementation** - a detailed discussion on the implementation of your proposed approach, including resource implications (i.e. a description of how you implemented this in your teaching, how many lessons/tutorials/labs did your run and what resources did you need for this).

- **Discussion of impact** - a discussion on the impact of your proposed approach compared to current practice (or alternative approaches published to date). Wherever possible this should be quantified (e.g. impact on student performance compared to previous years) or at least qualitative reflection of students’ perceptions of the proposed approach (e.g. questionnaire responses, with questionnaire attached and clear statistical analysis of the results).

Pedagogical Research

As a research paper, articles of this type should be structured as follows:

- **Introduction** - state the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results, but providing a critical review of the current pedagogical theories relating to the area you are addressing.

- **Materials and Methods** - provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

- **Theory** - A theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. You should clearly present your hypothesis in terms of pedagogical aspects debated and reason the basis for your theories.
• **Results** - results should be clear and concise and investigate in a structured matter the hypothesis you set out above. Results may be: A robust set of learning objectives with cognitive levels identified. A pedagogical approach that was particularly successful in moving through a difficult instructional barrier. Show substantial impact on student learning through quantitative measures.

• **Discussion** - this should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature, but clearly set your results in the context of the relevant established pedagogical theories.

• **Conclusions** - the main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

**Tools for Sharing with Community**

Presenting proposed tools and interventions that have yet to be fully tested, focusing on their intended learning outcomes and educational goals and including critique and discussion from experts in the field as well as inviting readers to take up the tools and contribute their own evaluations. For this type of paper, we expect at least the following:

• Expand on the intended learning outcomes (ILOs) - what they actually are, what are you trying to achieve and why using this method.

• Clear description of the approach, a clear link to the ILOs and how you propose to measure achievement.

• If you have applied this approach with your students, how did it measure up in terms of ILOs?

• Provide supporting material for the implementation of this simulator/approach so that colleagues could test it with their students (this would be 'ready to use' provision so the code/tool including instructions for use so that anyone can pick it up and run with it).

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