



... Words from the EdSIG's Newsletter Editorial Team...

If anyone would like to write an article for the newsletter about good practice, previous EdSIG events or school outreach, or anything else that you think our community would find it interesting - please do not hesitate to get in touch at edsig.news@ichememember.org.

This issue we have a sharing on game-based learning in the Online Teaching & Assessment section, where the author shares tips on handling laboratory sessions which could not be shifted to online. Please write to us if you have any good tips or experiences to share with the community at edsig.news@ichememember.org.

Online Teaching & Assessment: Tips and Resources

Game-Based Learning: Kahoot! in Chemical Engineering Education

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Most educators acknowledge that it is challenging to maintain students' motivation, engagement and focus in lecture classes. The lack of learning motivation can lead to the reduction of learning outcomes and create an inconducive learning environment. Furthermore, this challenge becomes more difficult in higher education with big classes and minimum interaction.

Currently, the advancement in learning technology such as game-based learning has garnered positive responses in improving students' learning experience. A well-designed game in education context is an efficient learning machine that motivates and engages students in class without jeopardising the scientific nature of a curriculum. Additionally, game-based learning could provide information on student learning at the end of the game, hence enabling educators to change their teaching plan and improve in the following lecture classes.

Lately, Kahoot! has been recognised as one of the most popular game-based learning platforms to improve teaching environments due to its simple set-up and versatility. Kahoot! is a game-based student response system that transforms the classroom temporarily into a game show in which the teacher acted as the role of game show host and the students are the competitors.

In this study, Kahoot! was incorporated in the lecture class of Chemical and Environmental Engineering undergraduate programme. The Kahoot! session was organ-

ised after the lecture of specific topics and is aimed to strengthen the students' understandings on the taught topics. Additionally, Kahoot! can be used in laboratory session where the laboratory demonstrator could deliver quizzes related to equipment safety, theoretical background and engineering principles to further enhance students' learning experiences in practical works.

Prior to Kahoot! sessions, educators should prepare the quiz questions based on the learning outcomes and the questions set should be short and precise (< 120 words). Figures related to the questions can be included as well to enhance the students' visualisation on the question. Figure 1. illustrates the user interface of Kahoot! quizzes.

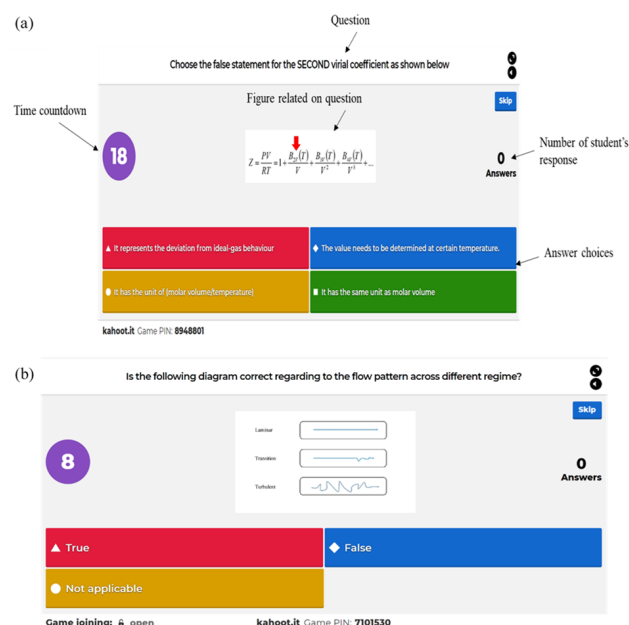


Figure 1. User interface of Kahoot! in (a) Chemical & Phase Equilibria module; (b) Fluid Mechanics laboratory sessions

The general methodology in setting up and implement Kahoot! sessions for chemical engineering education is as follows:

- i. Log in at <https://kahoot.com/> or register at <https://create.kahoot.it/register> for new user.
- ii. Create new quiz questions through a simple step-by-step guide.
- iii. Outline and design the intended questions based on learning outcomes.
- iv. Launch the Kahoot! quiz in class using any web-browser on instructor's digital devices such as computers or laptops which are connected to large screen or projector (for clear display to students).
- v. Request students to join the Kahoot! session by inserting the 6 digits game pin code shown on projector screen at <https://kahoot.it/> or Kahoot! app using their own digital devices.
- vi. Begin the Kahoot! session and allow the students to answer the quiz questions.
- vii. At the end of each quiz question, instructor can provide immediate feedback to students or open opportunity for discussion on the topics.

A survey questionnaire was distributed to 220 undergraduate students in Department of Chemical and Environmental Engineering and students' feedback on Kahoot! in chemical engineering education was collected. Figure. 2 illustrates the students' opinions if Kahoot! should be recommended in chemical engineering education. According to the students' responses, 81.3% of the students recommended Kahoot! to be applied in chemical engineering education. Some of the positive feedback received from students include:

"Provides a fun and engaging platform for students to grasp and conclude the information of the topic taught on that day." ~ Student A ~

"I think it gives students a good overall recap of the topic for the module at the end of each class." ~ Student B ~

"It helps me focus on the lecture rather than daydreaming." ~ Student C ~

"Straightforward and informative." ~ Student D ~

However, a small number of students also commented on the limitation on Kahoot! and the comments were as follows:

"Time constraints, sometimes it's hard to understand the question." ~ Student E ~

"I think teachers have too many questions which makes me lose interest." ~ Student F ~

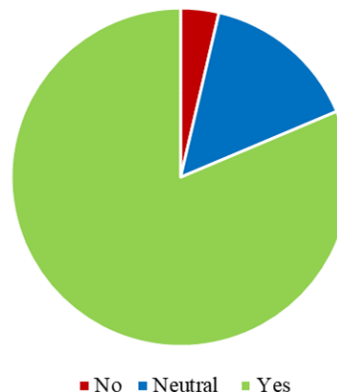


Figure 2. Students' opinions on the recommendation of using Kahoot! in chemical engineering education.

These findings have implied that in general, Kahoot! can enhance the students' learning experience in the chemical engineering programme. The students will be able to be more focused and recapitulate the learning outcomes in the end of class via Kahoot! Additionally, the educators could further improve the learning experience by allocating appropriate amount of Kahoot! quiz questions with sufficient time for students to think and answer. Overall, a well-designed Kahoot! session can improve the students' knowledge understanding effectively, thus improving their academic performance in chemical engineering programme.

We are grateful to those who take the time to contribute to the EdSIG Newsletter. Please note that content and opinions are those of the contributor(s) named above (or in resources accessed online) and do not necessarily reflect the views of the Education Special Interest Group Committee or the Institution of Chemical Engineers.

EdSIG Activities

2nd December — Webinar: Transition from Undergraduate to Post Graduate Studies: Opportunities and Challenges (<https://www.icheme.org/membership/communities/special-interest-groups/education/events/2-12-20-transition-from-undergraduate-to-post-graduate-studies-opportunities-challenges/>)

See <https://www.icheme.org/membership/communities/special-interest-groups/education/events/> for more details.

Elsewhere

The **European Federation of Chemical Engineers (EFCE)** is organising a series of free virtual spotlight talks on significant topics in Chemical Engineering. Eleven of our technical groups (Working Parties and Sections) are delivering short sessions of three or four talks by leading industrial and academic experts on:

Chemical Reaction Engineering, Education, Energy, Loss Prevention and Process Safety, Mechanics of Particulate Solids, Mixing, Multiphase Flow, Process Intensification, Quality by Design, Static Electricity in industry, Thermodynamics and Transport Properties.

Each session will focus on key topics in the area and the series enables attendees to sample topics in areas that they find interesting but may not otherwise have had the opportunity to attend to encourage cross fertilisation between specialist areas.

Further details and registration links at: [https://efce.info/Spotlight Talks.html](https://efce.info/Spotlight_Talks.html)

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EdSIG AGM 2020

26th of November 2020

8:30-9:30 GMT, Online

The meeting is opened to all members of the EdSIG. It will be an opportunity for the members of the EdSIG to receive reports on recent activities as well as the financial position of the group. Officers and committee members will be elected to positions. EdSIG members can provide nominations and likewise those members who can vote can do so.

Connection details

[Join Skype Meeting](#)

Join by phone

Toll number: +1 646-518-9360,637330582# (Dial-in Number)

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Australia, Sydney	+61 (2) 83180114	South Africa, Cape Town	+27 (21) 8340898
Malaysia, Kuala Lumpur	+60 (39) 2125087 +60 (39) 2125215	Singapore, Singapore	+65 (3) 1570178
New Zealand, Wellington	+64 (4) 2807355	United Kingdom, London	+44 (20) 33215205

Agenda

1. Approval of the minutes of the 2019 AGM
Available through [Education Special Interest Group\Resources\Committee Minutes\](#)
2. Chair's report
3. Financial report
4. Membership report
5. Officers and committee members' election
6. Any other business