Fostering a mobile-assisted peer-led e-learning (MAPLE) community to facilitate peer learning for large-sized science foundation courses

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A unique integrated science course for science students with different background

- SCNC1112 *Fundamentals of Modern Science* is a Science Foundation course co-taught by three teachers from different departments/schools (enrollment reaches 600 students each academic year)
- It adopts an **integrated approach** and encompasses physics, astronomy, earth sciences, chemistry, and biology.
- Major themes include (i) the **science core** (i.e., general principles and unifying concepts), (ii) **contemporary** developments of science, and (iii) the **interconnectedness** of different branches of science
- Major challenge**:** large disparity in the level of fundamental science training among the enrolled students

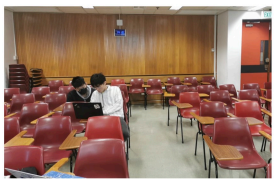
The previous peer-assisted learning (PL) system adopted

- A students-helping-students system first launched in 2016-17
- Student Peer Leaders as learning partners between teachers and students by conducting *biweekly small group discussion sessions of assessment-type problems and one-on-one help sessions (before quiz/exam)*
- Before COVID: ~40% of students participated in at least one session
- **After COVID**: participation dropped to less than 10% of all students enrolled
- Change of students' learning habit to engage with learning materials

Before COVID

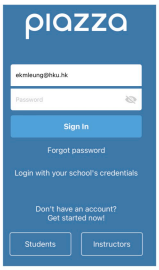
vs

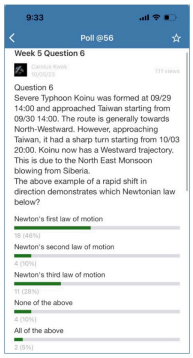
After COVID

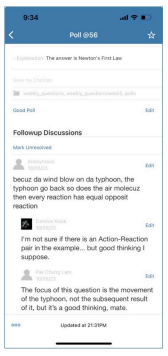


Enhancing students' engagement by MAPLE

- Converted the entire PL system from face-to-face to online only in 2023-24 with the support of TDG
- Adopted ***Piazza*** platform to integrate all PL resources
  - *Weekly multiple-choice practice questions*
  - *Discussion forum (can post anonymously)*
  - *Live Q&A sessions (before quiz/exam)*
- Most questions posted answered by Peer Leaders within 24 hours of posting
- A convenient, safe and monitored online community (registered students only)





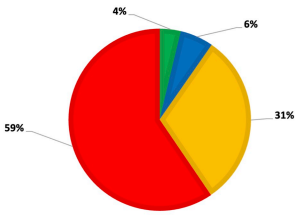


Screen shots of weekly MC questions (*left*), and follow-up discussions (*right*) in Piazza where students and student peer leaders discuss further on the MC questions

41% and 36% of students in Semester 1 and Semester 2, respectively, regularly engaged with MAPLE

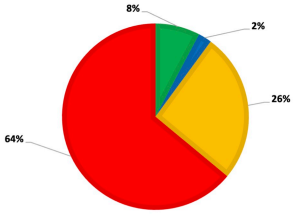
2023-24 Semester 1

Number of users: 321



2023-24 Semester 2

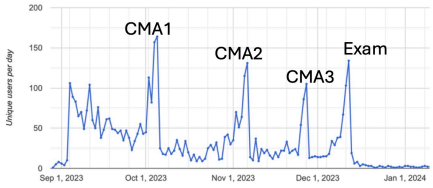
Number of users: 258



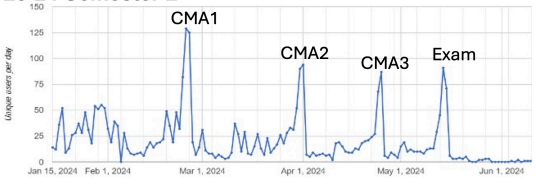
	Days logging on MAPLE
Active Users	> 61
Common Users	31 – 61
Less Frequent Users	11 – 30
Inactive Users	< 11

- Live Q&A sessions were held one day before quizzes (CMA1, CMA2, and CMA3) and a few days before final examination
- **Students' engagement in MAPLE strongly correlated with assessments**

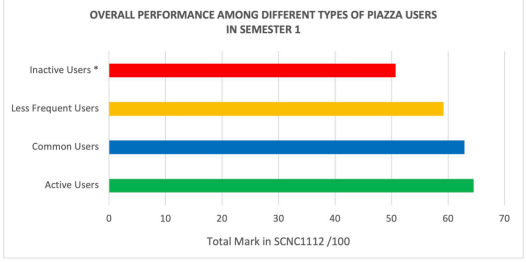
2023-24 Semester 1

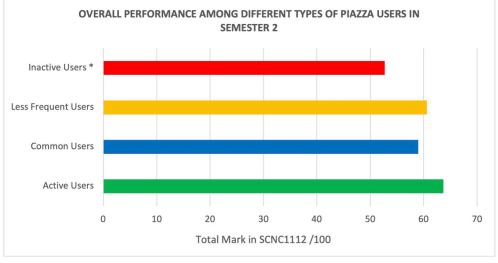


2023-24 Semester 2



The overall performance of students among different types of users was studied. It was found that **active users of MAPLE performed better in the course with higher average scores**.





Conclusion

- The MAPLE platform is an **all-in-one** and **convenient e-learning platform** to enhance student engagement with peer learning
- Provides **formative-assessment-like** opportunities with **timely feedback** to support students' learning
- **Student-centered**: students access the MAPLE platform on their schedule and study at their own pace
- **More effective drawing student participation** compared with face-to-face sessions