

Gamified mobile learning platform in large size engineering subjects:

An overview and qualitative assessment

Olga Mikhaylova
Dr Mahdi Disfani

Melbourne School of Engineering

Subject overview

- CVEN90050 Geotechnical Engineering – a core subject of the Master of Engineering (Civil) and (Structural) degrees
- Typically, more than 200 enrolled students
- Very “technical” subject
- Students commented that the subject is “difficult” and that they would benefit from more feedback during semester
- Typically, a relatively high failure rate
- Currently 3 assignments of 30% total during the semester

Subject challenges

1. How to assess students understanding of wide range of topics taught during the semester?
2. How to provide timely feedback to a large number of students on their progress?
3. How to improve students' engagement with the subject content during semester?

Mobile apps in tertiary teaching

- Mobile apps can provide timely feedback on learning
- Evidence-based studies into the higher education learning using mobile app technologies are scarce
- Some apps use Points, Badges and Leaderboards (PBL) gamification model (Werbach & Hunter, 2015) to increase engagement of learners with app contents
- 'Push notifications' can be effective in prompting immediate learning and helping learners stay up-to-date with content (Garbrick & Clariana, 2015; Kudo et al., 2015)



- Quitch is a gamified mobile learning platform for teaching within higher education
- Quitch is a quiz game that challenges students to learn, but in a fun way
- The app helps students to stay engaged with the subject, self-assess their progress and get some fun

How did we used Quitch?

- Three questions were released each week, after the Friday lectures
- Push notifications supposed to appear after the questions were sent
- Students had until 11:59 pm on Sunday to answer weekly questions
- 1 to 3 mins were given to answer each question. Students had 3 attempts to answer each question and score points

How did we used Quizch?

- Questions were divided into modules: "Introduction", "Consolidation", "Geotechnical strength", etc.
- Students answered questions to the best of their ability and earned points and badges
- Students could check how they were doing in the Leaderboard
- Quizch questions were not compulsory and Quizch scores did not affect student marks

Examples of questions

QUESTION 3

02:29

A 5.0 m thick clay layer has the coefficient of consolidation C_v is $0.955 \text{ mm}^2/\text{min}$. The layer is under two-way drainage, upward and downward. Calculate the time required for 90% consolidation settlement. (You can use $T_{90} = 0.848$ in your calculations).

a) 3.5 years

b) 42.2 years

c) 10.6 years

d) 7.0 years

SUBMIT

QUESTION 1

00:32

Consolidation is the graduate reduction in **volume** of a **fully** saturated soil of _____ permeability due to drainage of some of the pore _____.

partially high low air water density

volume fully

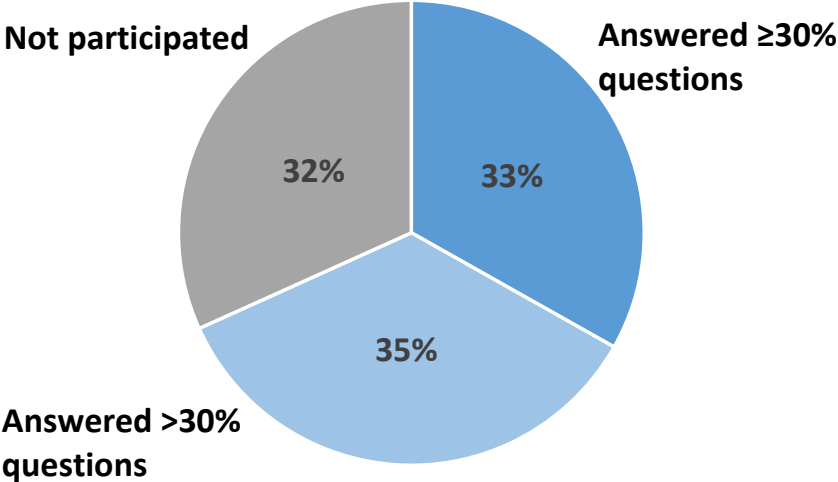
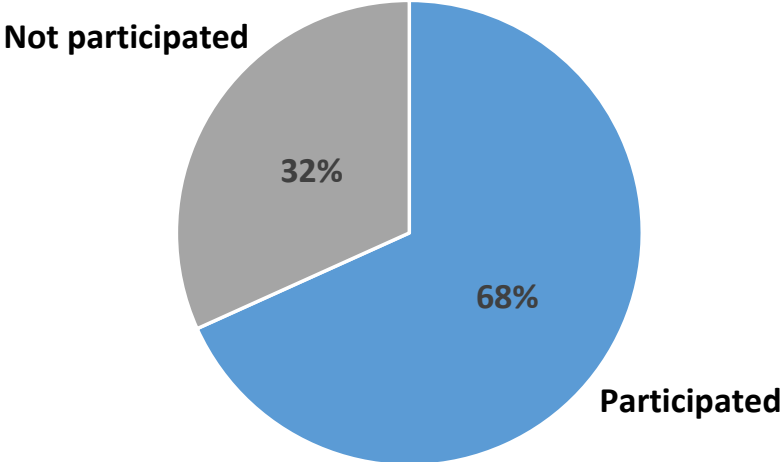
SUBMIT

Leaderboard, badges and scores

Rank	User	Score	Badges
1.	User1	307	9, 8, 7, 10
2.	User2	293	9, 8, 7, 10
3.	User3	284	9, 8, 10, 6
4.	User4	276	9, 8, 7, 10
5.	User5	276	9, 8, 7, 10
6.	User6	274	9, 8, 7, 10
7.	User7	270	9, 8, 7, 10
8.	User8	258	9, 10, 8, 7
9.	User9	250	10, 11, 9, 8

- Students are allowed to stay anonymous
- Badges were given for achieved levels, certain numbers of correct answers in a row and other achievements
- First 10 places were seemed to be competitive

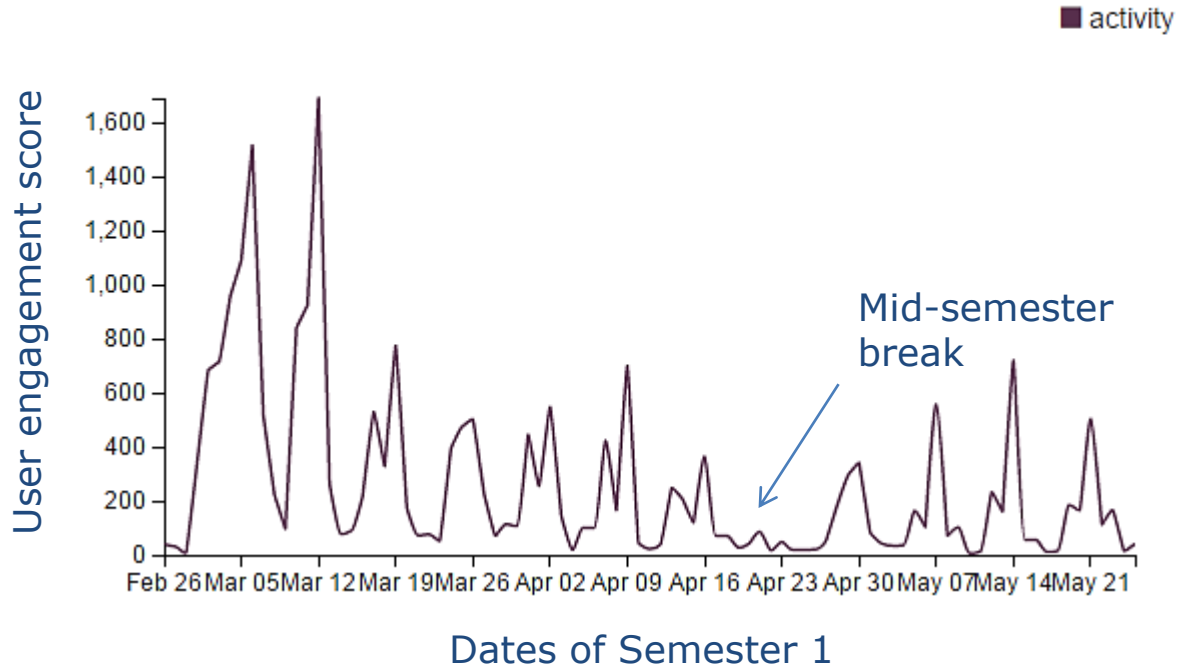
Observations: Participation



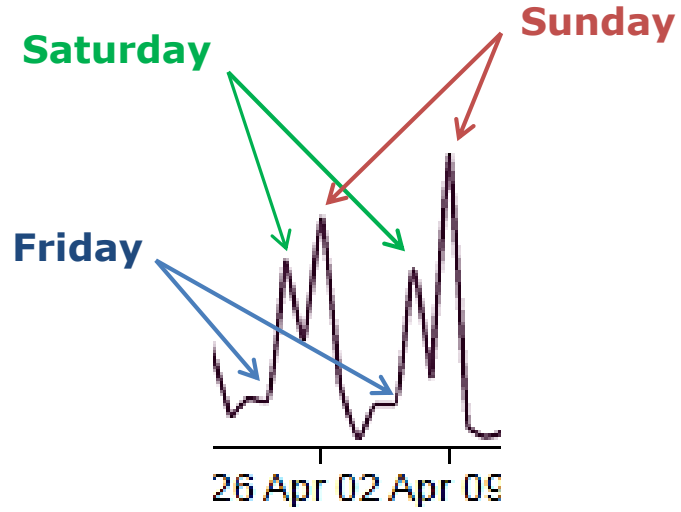
Total: 211 students

Observations: Engagement

User engagement

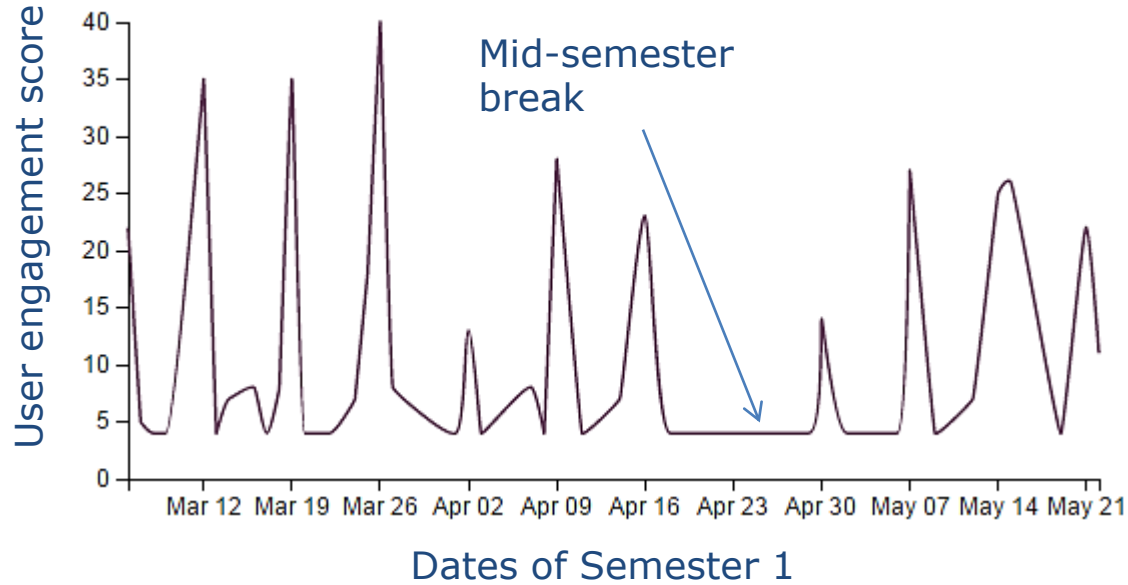


Observations: Engagement



Observations: Individual engagement

User5



Preliminary results

- In the SSLC Feedback: *"All respondees use Quitch and think it's great."*
- We yet to receive SES for the subject to see changes in overall student feedback on the subject.
- 33% of students were voluntarily actively engaged with Quitch. **Is this many or not that many?**
- Who are these 33%? Would they be engage with the subject anyway (i.e. without Qutich)?

Suggestions for improvement

- Some incentives are needed. Make Quitch compulsory? or Offer bonus marks for achievements in Quitch?
- Use less challenging questions? or Use more challenging questions?
- Ask questions more often?
- Better promote the game aspect of the app?
- More evidence-driven studies are needed on game-based mobile learning apps for tertiary education.