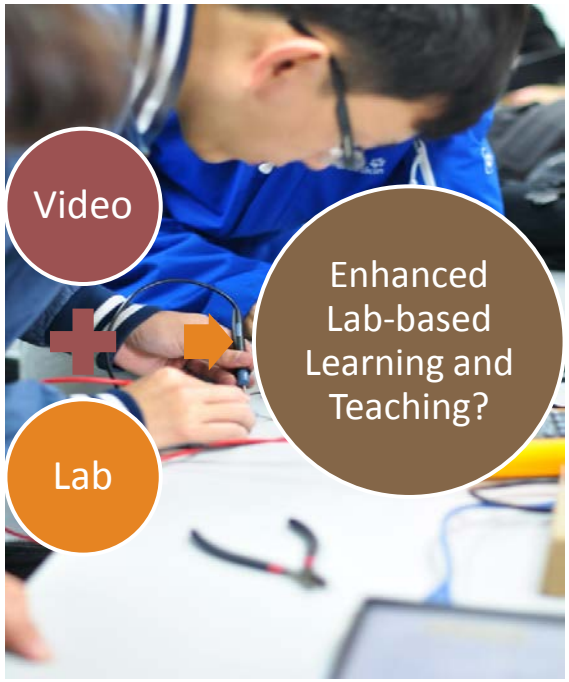

Student-generated Video Tutorials for Electronic Lab-based Learning and Teaching

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Background

From the flipped classroom to the flipped laboratory

Existing issues in the current lab-based learning and teaching

Student generated video tutorials on lab instruments

From the Flipped Classroom to the Flipped Laboratory

- Video tutorials play important roles in education with the development of the approach of "flipped classroom"
- Learning contents are delivered through "videos" or other multimedia channels before the class
- More time can be then saved for student-centred activities

"This isn't what I imagined when they said 'flipped classroom'!"

From the Flipped Classroom to the Flipped Laboratory- Cont'd

- Lab-based learning and teaching is practice-oriented and project-based
- Students take a leading role and receive support from coordinator
- Laboratory-based Learning and Teaching are naturally flipped

Existing issues for current lab-based learning and teaching

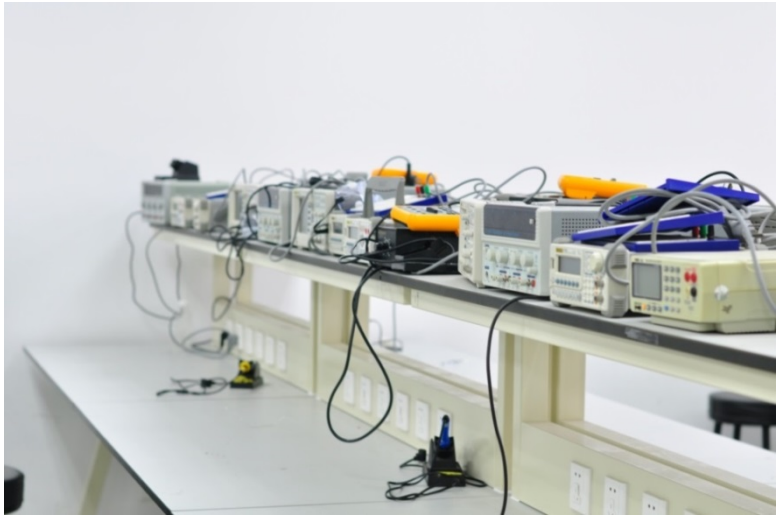
- Key information easily missed in traditional teaching channels
  - Lack of effective method to keep students involved before the lab
  - Too much hands-on technical information
  - Lack of effective communication channels

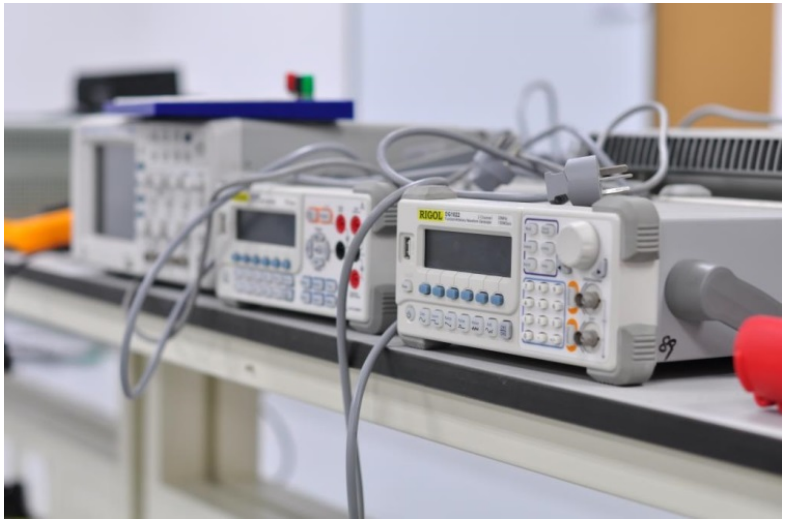
Student generated video tutorial on Lab Instruments

- Students help students to **motivate** students
- Flipped laboratory to **prepare** students
- Video tutorials to **instruct students** with better communications

Why Lab Instruments First?

- We selected 4 most commonly used instruments in electronic laboratory:
  - oscilloscope,
  - Multimeter
  - DC power sources
  - AC signal generator
- The videos can be shared across different modules and receive the widest interests within the department.





Project Implementation

Project schedule

Implementations

Video distribution on ICE

Project schedule

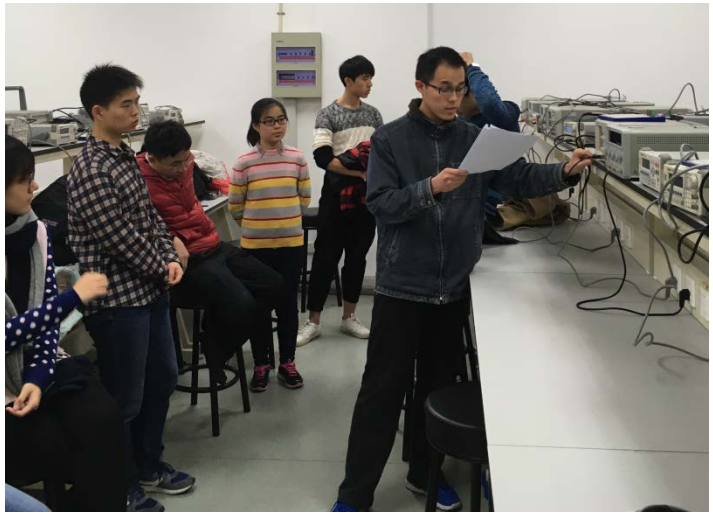
Implementations: Volunteer Recruitments

- One project manager: a year-three student Mr. Xiaoyang Wang
- 9 Volunteers in 5 groups from year-two students

Task	No. of Volunteer Needed
Oscilloscope	2
DC Power supplier	2
Multimeters	2
AC Signal Generator	2
Video editing	1

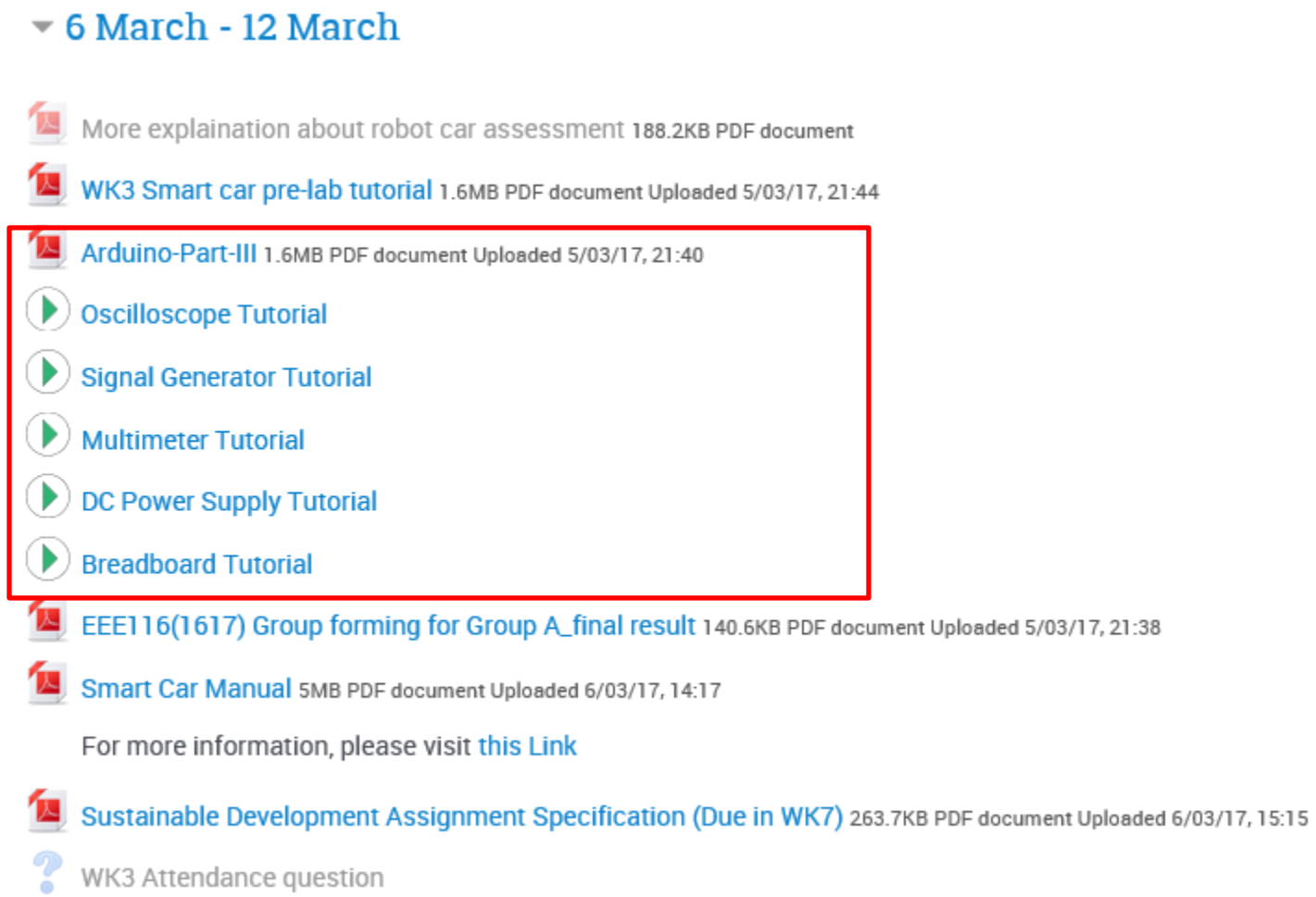
Implementations: Training and Preparation

- Previous experiences of using the lab instruments add into student perspectives
- Project participants well awarded by the detailed feedbacks provided during training
- Grouped in pair to invoke team work and promote active learning



Implementations: video making

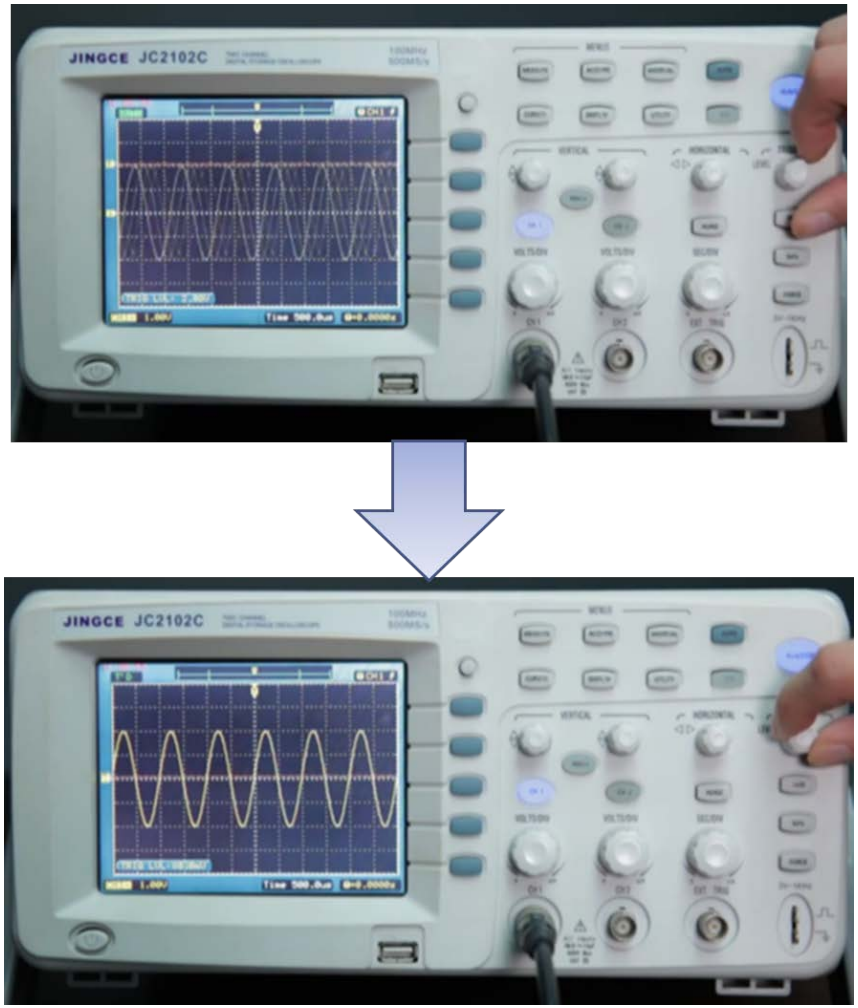
Implementations: Video Distribution on ICE



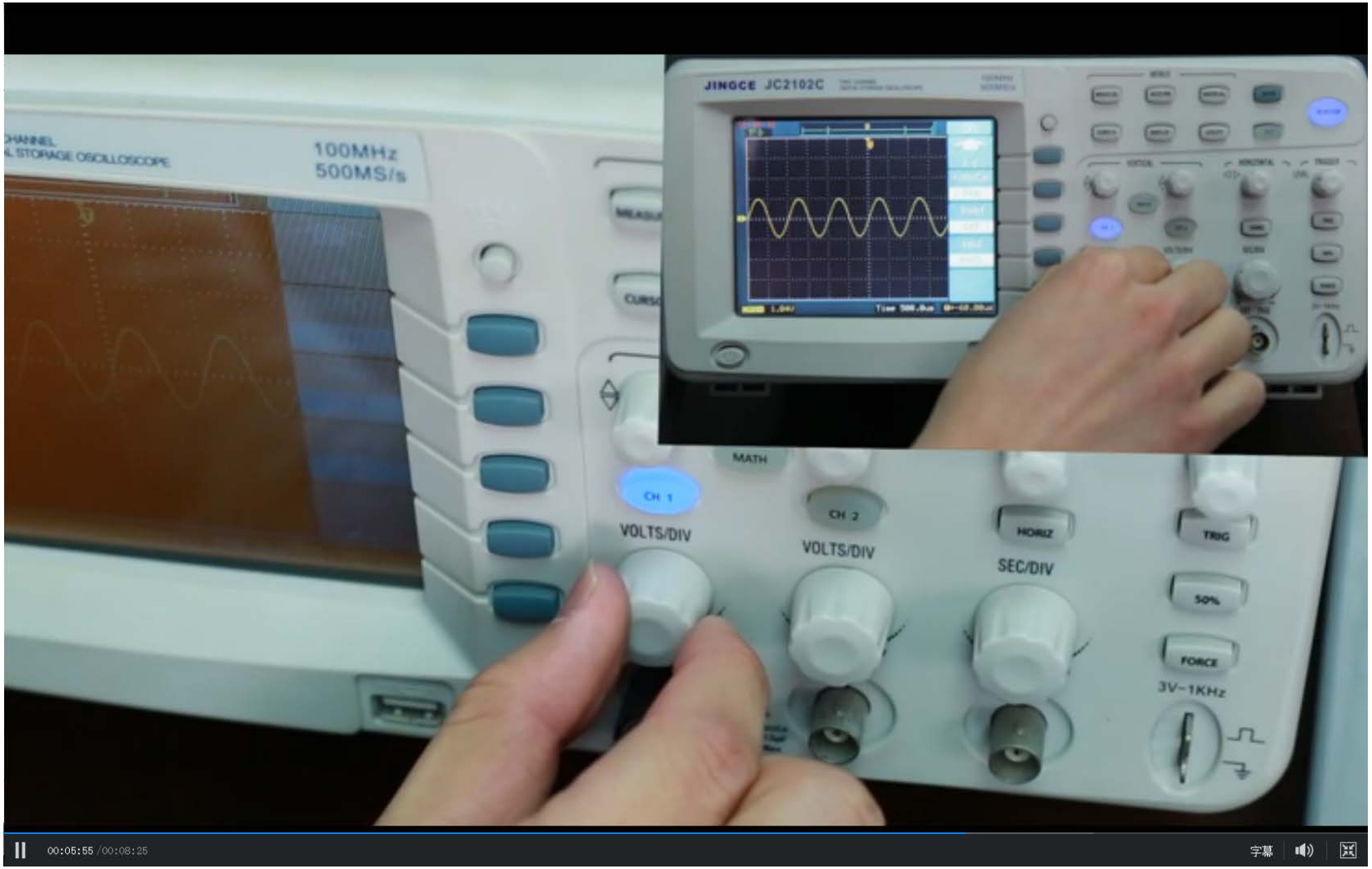
Video Tutorials

Video Tutorials

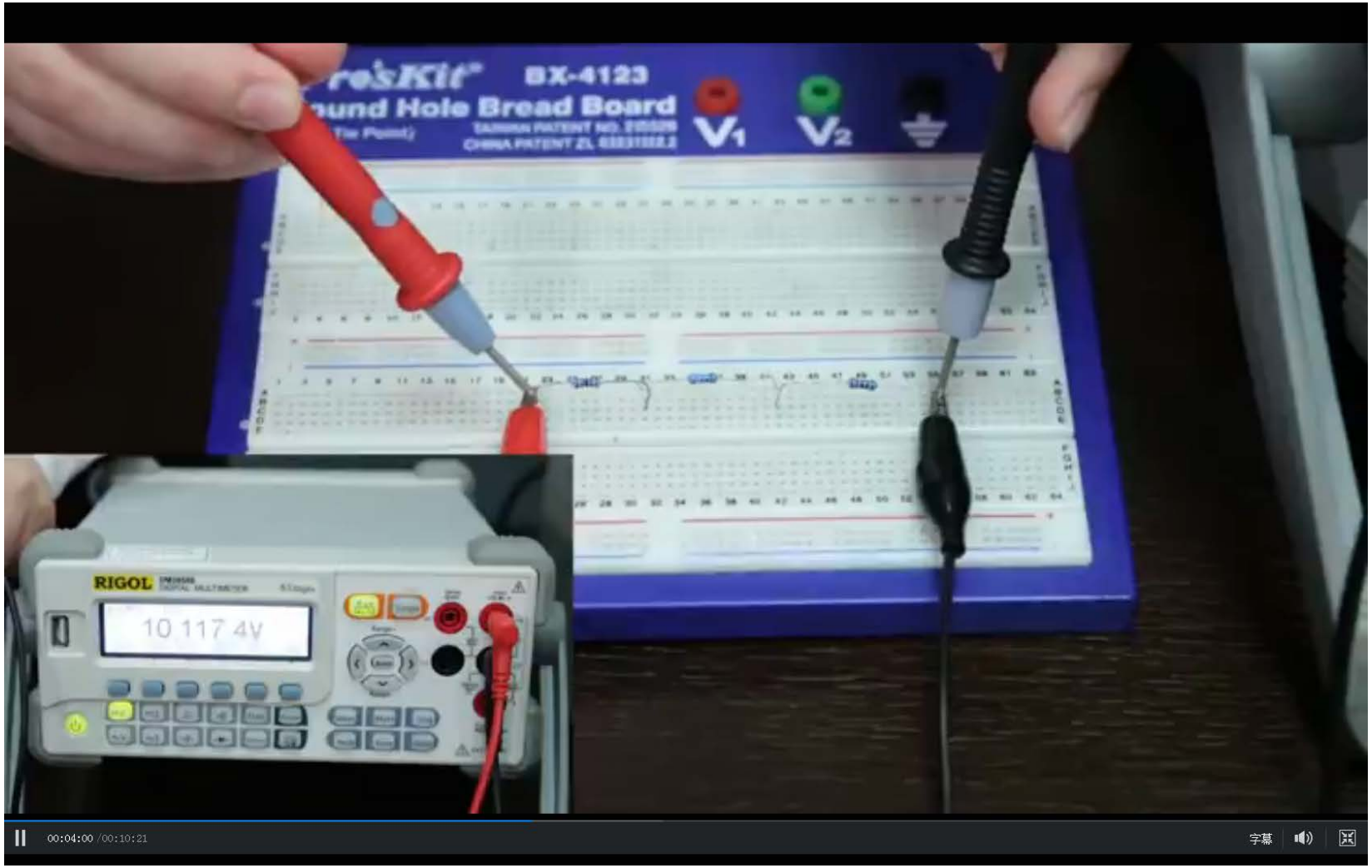
- Carefully designed and tailored
- Seamlessly integrate the theoretical and practical information
- Full details presented



Video Tutorials- Cont'd



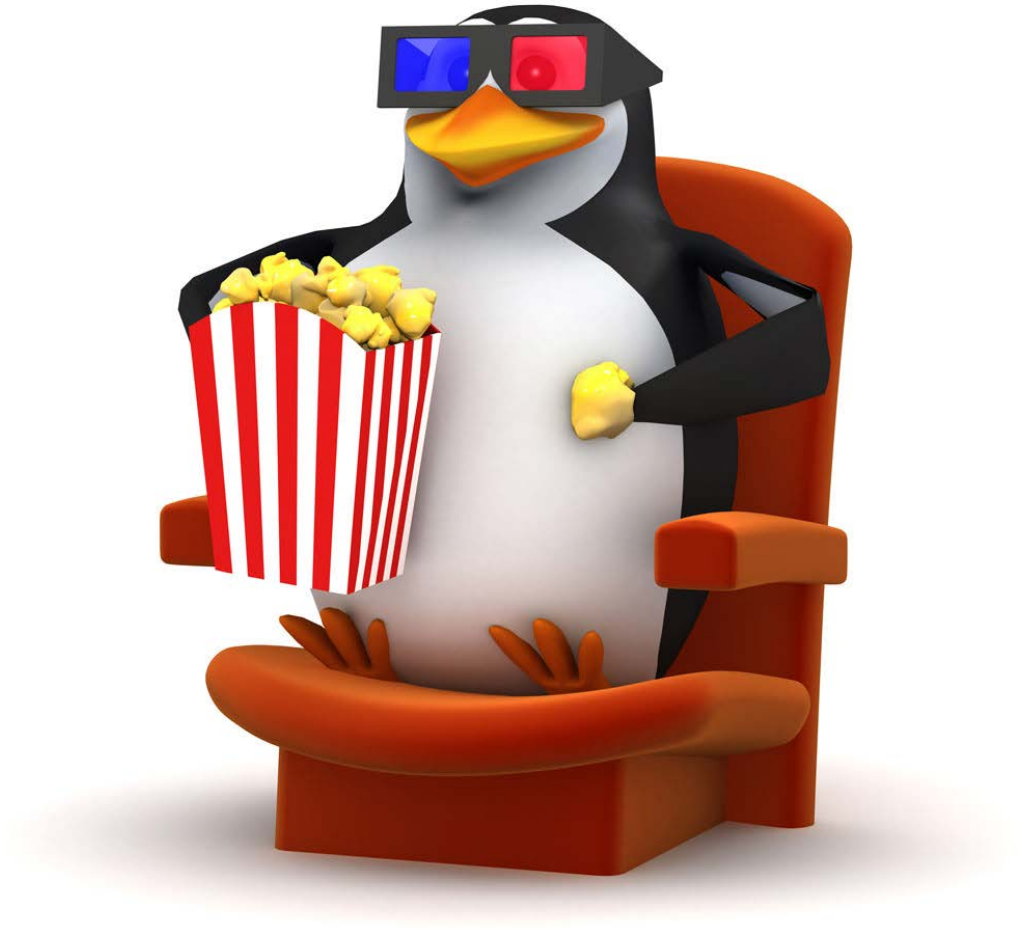
Video Tutorials- Cont’d



Feedbacks from Students

- 84% of responding students strongly agree or agree that the video tutorials helped them improve relevant lab skills.
- 86% of responding students prefer watch videos rather than instructions in texts or pictures.
- 82% of responding students strongly or agree that the video tutorials are clear and easy to understand.

Sample Video Tutorials- Multimeters



Conclusions and Acknowledgements

Conclusions

- Video tutorials are found to be an effective way of addressing current issues in lab-based learning and teaching
- Student volunteers involved in the video making process provide extra advantages
- Video tutorials have been applied in year-two modules and received positive feedbacks
- Further study need to consider the exploitation of similar methods in flipped classroom, e.g. student volunteers and project assessment based on videos

Acknowledgements

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  - Zhirui Xu and Yao Wu (AEC)
  - Xiaoyang Wang (Year-3 student, EEE)
  - 8 year-2 EEE student volunteers:

Multimeter	Zhang Wenrui & Yao Shuxin
DC Power	Liu Zhenbang & Chen Qian
AC Signal Generator	Li Xiaoting & Zhu Di
Oscilloscope	Liu Hejin & Tan Zikun


Thank You!
Q&A