



Cawangan Kedah  
Kampus Sungai Petani

Faculty of Administrative  
Science and Policy Studies

# i-SPIKE 2021

*Leading An Artificial Innovation In Knowledge, Education And Design*

## **i-SPIKE 2021 INTERNATIONAL EXHIBITION & SYMPOSIUM E-PROCEEDINGS**

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## THE EFFECTIVENESS OF I-LAB V2 AS A TEACHING TOOL FOR ONLINE DISTANCE LEARNING

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### ABSTRACT

Due to COVID-19 outbreaks in Malaysia adapting a new norm for teaching and learning is required. UiTM has shifted the teaching and learning from traditional method to Open Distance Learning (ODL) which required sudden changes towards the lecture. All teaching and learning sessions should be conducted online but the concern arises on laboratory courses. Most of the Engineering Programmes in Malaysia are still practicing the traditional method for laboratory courses in delivering process, preparing the laboratory report, and submitting the report. Therefore, i-LAB v2 is introduced for the Water Engineering Laboratory subject in ensuring the CO and PO are achievable and to merge with ODL. i-LAB v2 consists of an excel template that provides all the information regarding the course which is Water Engineering Laboratory. The information includes the laboratory manual, apparatus needed for the experiment, video of the laboratory procedures and a section for the students to prepare their laboratory report. A pilot study on the application of i-LAB v2 was conducted among 29 semester five students. They were given a set of survey to get feedback regarding the effectiveness of this template to be used as a teaching tool for laboratory courses. From the survey given, 44.82% of the students agreed to use i-LAB v2 for preparing laboratory report, while 44.83% of the students were neutral and 10.35% of the students did not agree to use this system. As seen from the survey only 10.35% of the students preferred using the traditional laboratory method for laboratory report preparation and submission due to the template required a big storage that makes it difficult to download on handphone and unable to view the video procedure of the laboratory. Therefore, based on feedbacks received from the survey, i-LAB v2 will continue to be used in this subject. Improvements will be made based on the respondents' feedbacks.

**Keywords:** online distance learning, laboratory course, laboratory report

### INTRODUCTION

In the process of flattening the curve for COVID-19 outbreaks in Malaysia, UiTM has shifted the teaching and learning from the traditional method to Open Distance Learning which

required sudden changes towards the lecturers and students since 13 April 2020. All teaching materials should be audience friendly for online teaching. It seems to be easy for lecture-based courses but a little bit of hiccup for laboratory courses. As for students taking the Engineering Programme, it is mandatory to register for a series of laboratory courses to complete the three years of study for Diploma in Civil Engineering.

Lecture-based courses are easier to digitise compared to laboratory courses. Meanwhile in laboratory courses, students need to be exposed to laboratory equipment and execute the experiment in the laboratory, but it is impossible during the pandemic. Therefore, preparing teaching materials for laboratory courses is a major challenge for the lecturers in providing content of the experiment and preparing the environment of the laboratory in digital content that are required to fulfill the course outcomes (CO) and programme outcomes (PO).

Most of the Engineering Programmes in Malaysia are still practicing the traditional method for laboratory courses in delivering process, preparing the laboratory report, and submitting the report. Based on previous studies conducted by Maiti (2010) and Kearns (2012), they urged academicians to provide a better laboratory management system including an online evaluation for the assessment, validation of experimental findings, evaluation of the laboratory report and giving feedback to students in a better platform for lecturers and students. Later, Anas et al. (2011) and Musingafi et al. (2015) found that online assessment and online submission are used for better tracking and grading process. Aini Hayati Musa et al. (2020) and Nurul Asma Mazlan et al. (2020) agreed that any module or programme used in online teaching should be user-friendly without compromising the quality of the content to satisfy the teachers' and learners' needs.

Therefore, i-LAB v2 is introduced for the Water Engineering Laboratory subject in UiTM Pasir Gudang in ensuring the CO and PO are achievable.

### i-LAB v2

i-LAB v2 is developed to help the lecturer in compiling all information on the experiment that needs to be carried out by the students of the course in one semester via a single platform. The information provided in i-LAB v2 includes the report cover, laboratory manual and videos of apparatus and procedures of the laboratory. i-LAB v2 was created using Microsoft Excel as an interface. Microsoft Excel was chosen as the interface due to capability of students to adapt to the software and it is using low bandwidths to download (Azlina et al., 2020 & Norhidayah & Azni, 2021). The difference between manual laboratory report and i-lab are displayed in Table 1.

**Table 1.** Comparison of i-Lab and traditional laboratory manual

i-LAB v2	Traditional laboratory manual
Using Microsoft excel and available in digital platform and ready to edit as offline once it is downloaded.	Using Microsoft word and printed as hardcopy material. Students need to retype the information in laboratory manual to digital form.
Provide all the necessary information regarding the experiment including the demonstration video.	Provide all the necessary information regarding the experiment excluding the demonstration video.
Students are required to edit and complete the finding, discussion, and conclusion in i-Lab.	Students need to start from scratch to prepare the laboratory report and print out as hardcopy evidence



The product of i-Lab can produce a complete report that can be converted to pdf form and ready to submit via email or any online platform to the lecturer.

before submitting to the lecturer.

## MATERIALS AND METHODS

i-LAB v2 consists of an excel template that provides all the information regarding the course which is Water Engineering Laboratory. The information includes the laboratory manual, apparatus needed for the experiment, video of the laboratory procedures and a section for students to prepare their laboratory report. Once they finish writing their report using i-LAB v2, they can save and convert their report into pdf format and send the report to the lecturer in softcopy form or students can print out the pdf format to submit the report in hardcopy. Figure 1 shows the first interface of the template. Students can use this template by hitting the ‘Start Test’ button.

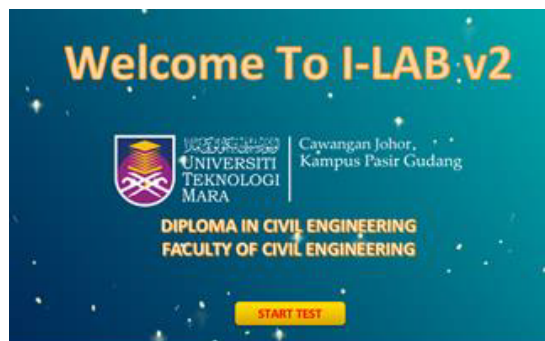


Figure 1. Interface of i-LAB v2

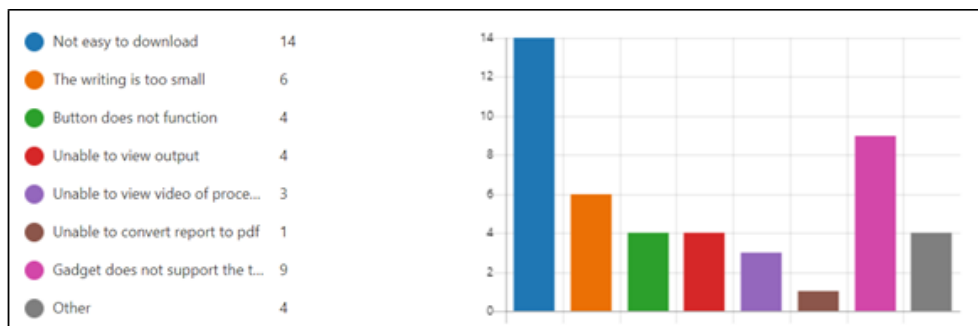
## RESULT AND ANALYSIS

A pilot study on the application of i-LAB v2 was conducted among 29 semester five students. They were given a set of survey to get feedback regarding the effectiveness of this template to be used as a teaching tool for laboratory courses.

34% of the students agreed that the template is easy to download with the average of 3.03 as stated in Table 2. Meanwhile, 52% of the students rated agree and strongly agree that this template is easy to fill in with the average of 3.45. 45% of the respondents rated agree and strongly agree that i-LAB v2 helps to reduce the time taken to complete the report with the average of 3.48. 45% of the respondents agreed that they like to use i-LAB v2 as a tool of preparing laboratory report with the average of 3.34.

Figure 2 shows the feedback from the students regarding the difficulties during using i-LAB v2. Students were allowed to choose more than 1 answer. 14 of the students chose that this template was not easy to download. This may be because of the large size of the template due to the video attachment in the template. The 2<sup>nd</sup> highest difficulty chosen by the students is their gadgets do not support the template. This template is designed using Microsoft Excel and suitable to be opened using a laptop or computer. Some students prefer to use smart

phone to use this template. However, other difficulties were due to the setting of the template itself and this can be improved by editing the template.



**Figure 2.** Feedback from the students regarding the difficulties using i-LAB v2

**Table 2.** Summary result of the survey.

Item	Description	Average
1	i LAB is easy to download.	3.03
2	i LAB is easy to fill in.	3.45
3	i LAB helps to reduce the time taken to complete the report.	3.48
4	I like using i LAB as a tool in preparing laboratory report.	3.34
5	i LAB can reduce the printing cost of the laboratory report.	3.86
6	The quality of the video of procedures provided in i LAB is satisfactory for Open Distance Learning.	3.69
7	i LAB 2021 can be used in another course as a tool in preparing the laboratory report.	3.48
8	Overall, I like using i LAB.	3.45

For the criterion on whether i-LAB v2 can reduce the printing cost of the laboratory report, 62.06% of the respondents strongly agreed and agreed that i-LAB v2 can reduce the cost of printing while the average recorded as 3.86. While for the quality of the video of procedure provided in i-LAB v2, 55.44% of the respondents were satisfied with the quality of video provided for ODL with the average of 3.69. 51.72% of the respondents agreed to use this system in other courses as a tool in preparing the laboratory report. For this criterion, the average is 3.48.

From the survey, 75.86% of the respondents did not have any suggestion to improve this system, while 24.14% gave suggestions on the improvement of i-LAB v2. The suggestions from the respondents were the system should be more user friendly and provide notifications to remind the students of the due date submission.

For the last criterion: whether respondents like to use i-LAB v2 in preparing the laboratory report, 44.82% of the respondents agreed, while 44.83% of the respondents were neutral and 10.35% of the respondents did not agree to use this system. As seen from the survey only 10.35% of the respondents preferred using the traditional laboratory method for laboratory report preparation and submission because the template required big storage capacity that makes it difficult to download on handphone and they were unable to view the video procedure of the laboratory. Therefore, based on feedbacks received from the survey, i-LAB

v2 will continue to be used in this subject. Improvements will be made based on the respondents' feedbacks.

## CONCLUSION AND RECOMMENDATION

In conclusion, it can be concluded from the survey given to the students that most students agreed to using i-LAB v2 in preparing their laboratory report for online distance learning. To continue using this system in ODL, some improvements need to be done to cater the suggestions from the students. Several improvements will be done such as the video procedure will be given via a link in i-LAB v2 to reduce the storage capacity of the template. Secondly, i-LAB v2 will be developed as an application which is suitable for handphone users. Lastly, the application will be improved on the feature template or interface such as on the size of fonts used and ease in converting to pdf format. After developing applications which are user friendly, it is suggested i-LAB v2 be used in other laboratory subjects in the future.

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