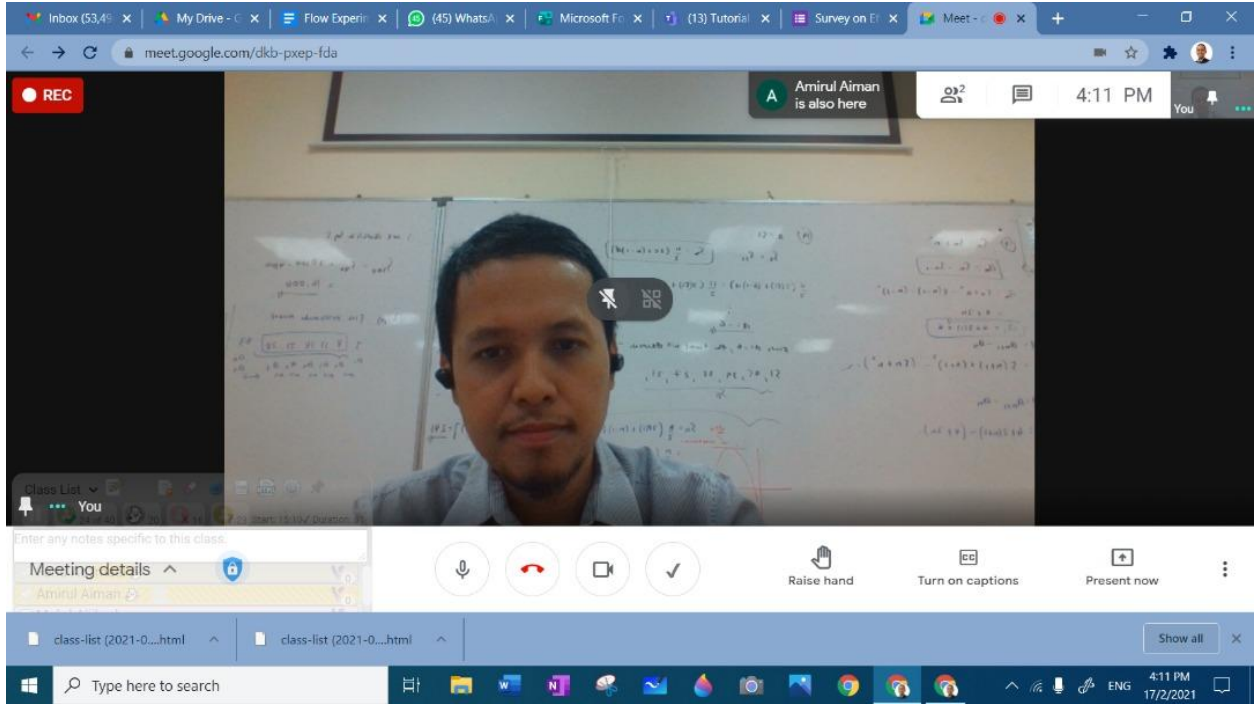




Gambar di sebalik tabir pengajaran di dalam talian  
(Behind the scene - Online teaching)



Bengkel Pedagogi PASUM secara online pada 29&30 Jun 2021 (Pedagogy Workshop: 29 - 30 June 2021, Online)



Pengajaran secara hybrid (Hybrid teaching)

Cisco Webex Meetings Meeting Info Hide Menu Bar ^

File Edit Share View Audio & Video Participant Meeting Help

Speaking: AIDA OTHMAN

Layout

ROOM 3 Academician

PRE-UNIVERSITY MALAYSIA INNOVATION COMPETITION 2021

ROOM 4 Academician

PRE-UNIVERSITY MALAYSIA INNOVATION COMPETITION 2021

Unmute Stop video Share

Participants Chat

Type here to search

4:36 PM 8/3/2021

Cisco Webex Meetings Meeting Info Hide Menu Bar ^

File Edit Share View Audio & Video Participant Meeting Help

Speaking: AFNANI ALWI @ ALI

Layout

ROOM 3 Academician

PRE-UNIVERSITY MALAYSIA INNOVATION COMPETITION 2021

ROOM 4 Academician

PRE-UNIVERSITY MALAYSIA INNOVATION COMPETITION 2021

Unmute Stop my video Share

Participants Chat

Type here to search

4:39 PM 7/5/2021

Menyertai PERTANDINGAN INOVASI INTER-ASASI MATRIKULASI (PIITRAM 2021) pada  
7-9, 15 Mac 2021



## PRE- UNIVERSITY MALAYSIA INNOVATION COMPETITION 2021

### A Low-Cost Approach to Increase Students Engagement and Understanding in Online Teaching & Learning using MS Teams with an A4 Paper Sized Whiteboard

#### Abstract

The current covid-19 pandemic has changed the way we teach and learn. Both educators and students must adapt to the on and off switch between the face-to-face and online learning. The challenge in teaching mathematics requires the educators to show step-by-step solutions and must be visualized for students' better understanding. In this research we have elaborated how we can achieve a more effective students' engagement and understanding in mathematics during online learning at a very low cost. This innovative online teaching and learning (T&L) is a hybrid of educational technology and traditional teaching method. First, we used Microsoft Teams to create class, forms, communicate and recording. We turned on the recording and asked the students to communicate through the chat box, voice, and video. Next, we asked the students to complete a feedback regarding the tutorial questions. Then, a document is prepared for the students to share their answers. Each student is assigned at least one tutorial question and they must upload their answer. These steps ensure that all the students participate during the class. The second part is continued with discussion based on the feedback form received from the students and the answers shared by them. To explain effectively, we used an A4 paper sized physical whiteboard (ASW) to write and share the step-by-step solution. Most institutions would provide desktop and Learning Management System (LMS) systems for their educators. The selection of the correct features in the LMS and when to use are important for effective teaching. Furthermore, online T&L requires additional tools to substitute the whiteboard. Although there are many options such as using touch screen devices and drawing tablets, these devices are costly compared to a simple A4 paper sized whiteboard and whiteboard markers. Apart from that, this method is simple, requires no new skills but accurate.

#### Objective



- To provide **educators** with tools which are **easy to use and time saving**.
- To ensure that the **online students** can **understand the explanation** by the educators especially the step-by-step in solving mathematics problems.
- The **institution** or educators only need to invest in a **small amount of cost** to purchase the tools.

#### Underlying Teaching Principles

- The **students** must learn **mathematics with understanding**, actively building new knowledge from experience and previous knowledge in online T&L.
- For **effective** online T&L, **educators** must use writing tools that are easy to use, fast, non-technical and able to explain clearly while writing.
- At the same time, the student must be able to view the whiteboard clearly with **no technical problems**.

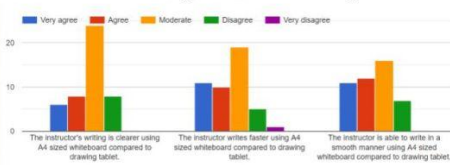
#### Innovativeness



- Three decisive factors in deploying technology in mathematics education; the design, **the role** of the **educator**, and the educational context (Drijvers, P. (2015))
- A4 sized whiteboard in online T&L is substituted for the physical whiteboard.
- The **students** had the **same experience** in learning through whiteboard similar to physical classroom.

#### Impact on Teaching and Learning

A4 Sized Whiteboard		Digital Drawing Board	
A4 Whiteboard	RM6.00	Digital Drawing Board	RM120.00
Webcam (1080 HD recommended)	RM40.00	Software - MS Whiteboard	-
Webcams' Stand	RM40.00		
1 Set of Markers	RM6.00		
Software - MS Camera			
<b>TOTAL</b>	<b>RM92.00</b>	<b>TOTAL</b>	<b>RM120.00</b>



(3) Convenient for **educators** to explain step-by-step mathematics calculation

(4) This innovation is also **suitable** to be used on other **subjects** that requires mathematical explanation.

(1) **Lower cost and affordable** for institution or educators to provide the tools

(2) **32 students agreed** that the ASW approach is **clearer, faster and smooth**

#### Comparison

A4 Sized Whiteboard



Digital Drawing Board



#### Students' Feedback

..the handwriting is more recognizable using white board  
 ..math subjects are more suitable with the use of A4 sized whiteboard since there's a lot of calculation steps.  
 ..Digital pen sometimes not functioning well. Hard to read. Screen also lags and i cannot see the what lecturer write.

Recognition (New Innovation)



#### Innovators Details & Photo



Anwar Mohamad Hussain Muzammil  
 Education Officer (Mathematics)  
 Center for Foundation Studies in Science &  
 Decapitate Student (Mathematics in Education)  
 Faculty of Education  
 Universiti Malaya  
 anwar@fssm.um.edu.my



Hukemri Zulaidi (PhD)  
 Senior Lecturer  
 Department of Mathematics & Science Education  
 Faculty of Education  
 Universiti Malaya  
 hukemri@fem.um.edu.my



Faridah Ibrahim (PhD)  
 Senior Lecturer  
 Division of Mathematics  
 Center for Foundation Studies in Science  
 Universiti Malaya  
 faridah124@um.edu.my



Poster pertandingan inovasi 1: A Low-Cost Approach to Increase Students Engagement and Understanding in Online Teaching \_ Learning using MS Teams with an A4 Paper Sized Whiteboard  
Mendapat Medal Perak



## PRE- UNIVERSITY MALAYSIA INNOVATION COMPETITION 2021

### An Innovative ViSeL Approach to Overcome Visual, Speech and Listening Barriers for Educators and Online Students in Hybrid Teaching & Learning

#### Abstract

The uncertainty of the Covid-19 pandemic has disrupted the normal teaching & learning (T&L) in the classroom. Hence, the class needs to be conducted in hybrid mode of face to face (for healthy students) and online (for quarantined students). In this research, we will present an innovative ViSeL (Visual, Speech and Listening) approach on how to effectively overcome visual, speech and listening barriers, among educators and online students in the hybrid T&L for mathematics lesson which requires step by step explanation. In a normal setting, a computer will be set up at a static position, usually at the front table, for the online students. The first challenge is to share the view of the classroom's whiteboard with a length approximately 6 meters. However, the camera is only limited to a certain range of view. In most cases it will not cover the whole whiteboard. To overcome this, an additional webcam is needed to cover the remaining areas. The next challenge is when the educator moves away from the computer. The computer's microphone will only be able to capture a low volume of the educator's voice and the educator will also have the difficulty to hear the online students' voice. Similarly, the online students will also receive a low volume of speech from the educator and the rest of the students in the classroom. To overcome this, a Bluetooth earphone with a microphone can be used. The selection of suitable devices is important to ensure that both educators and online students in hybrid T&L receive the same level of visual, speech and listening ability. The additional devices suggested are a webcam and Bluetooth earphone with microphone which can be purchased at a minimal cost. Further research can be done on the application at various levels of study in the future.

#### Objective



- To provide the **online students in a hybrid class an equal ability to visual, speech and listening** to lessons similar to the face-to-face students in the classroom.
- To design a **system** that can be used by **educators seamlessly**.
- A **minimum cost** for the **institution** or educators to implement.

#### Underlying Teaching Principles

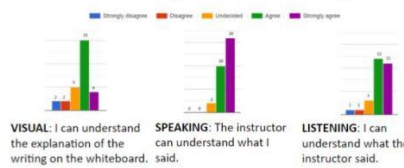
- Equality of access** to information for both **online and face to face students**
- Effective teaching involves adopting appropriate **teaching roles** to support our learning goals and **create an active learning environment** for both types of learners.
- To become self-directed learners, both types of **students** must learn to monitor and **adjust their approaches** to learning.

#### Innovativeness



- Krishnan, S. (2018) emphasize the needs to bring in the **similar experience to traditional classroom for the online students** so that they can learn comfortably
- Google Meets** is opened in 3 separate browser tabs to feed three sources of videos; laptop, webcam 1 and webcam 2.
- A **TWS bluetooth earphone with a microphone** is used by the instructor so that the instructor can listen and speak clearly.

#### Impact on Teaching and Learning



(1) **Easy to use** and to set up for the **educators**

(2) **32 students** said that the **visibility, listening and speaking were good**.

(3) **Affordable** for **institution** or educators. Minimum set-up:  
 - Google Meet (Free)  
 - 1 x Webcam (RM40.00)  
 - 1 x Stand (RM10.00)  
 Total RM50.00

(4) **Suitable** for **other subjects** that requires using hybrid mode.

#### Activities



Before ViSeL (Only 1 part of the whiteboard can be viewed)



After ViSeL (3 way viewed that gives more coverage)



#### Students' Feedback

..audio was crystal clear and can be understood easily.  
 ..make sure the camera is focused cause sometimes its blurry  
 ..sometimes i can't see the whiteboard clearly because of my internet connection. The instructor's camera is okay, but my internet connection is the problem.

Recognition (New Innovation)



#### Innovators Details & Photo



Anwar Mohamad Hussain Muzammil  
 Education Officer (Mathematics)  
 Center for Foundation Studies in Science &  
 Decapitate Student (Mathematics in Education)  
 Faculty of Education  
 Universiti Malaya  
 anwar@kfsstpm.um.edu.my



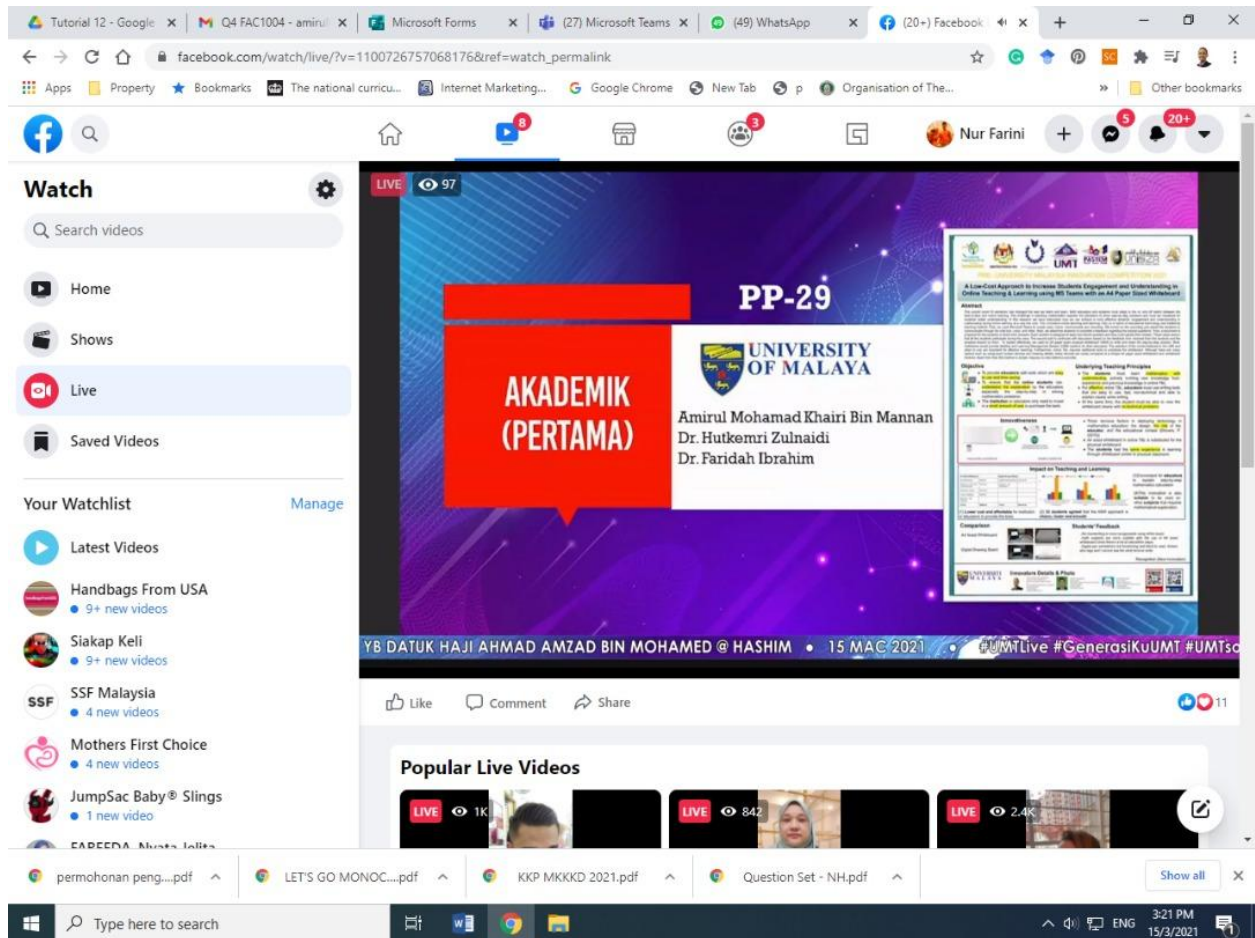
Hukemri Zulaidi (PhD)  
 Senior Lecturer  
 Department of Mathematics & Science Education  
 Faculty of Education  
 Universiti Malaya  
 hukemri@fkm.um.edu.my



Faridah Ibrahim (PhD)  
 Senior Lecturer  
 Division of Mathematics  
 Center for Foundation Studies in Science  
 Universiti Malaya  
 faridah124@um.edu.my



Poster pertandingan no.2: An Innovative ViSeL Approach to Overcome Visual, Speech and Listening Barriers for Educators and Online Users in Hybrid Teaching & Learning. Mendapat Medal Emas



Mendapat anugerah poster terbaik kategori akademik