



Mahidol University
Wisdom of the Land

Virtual Environments and Avatars for Education

Dr. Thanapon Noraset

Inspiration and Friends



Educational Technology and
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Dr. Pisit
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Dr. Siripen
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Dr. Morakot
Choetkiertikul



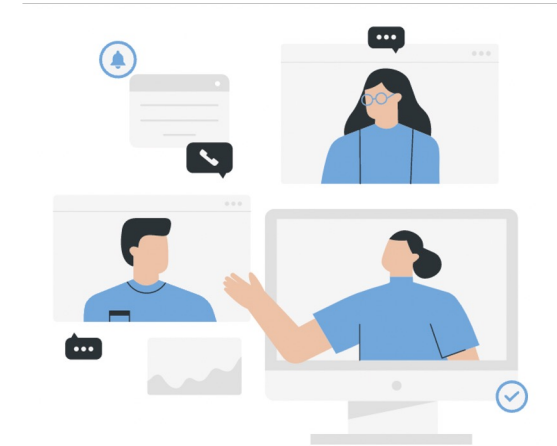
Dr. Chaiyong
Raghitwetsagul

Online Teaching/Learning: Opportunities



Large amount of students
(no space limit)

Remote collaboration



Interactive polls, Q&A, and chats

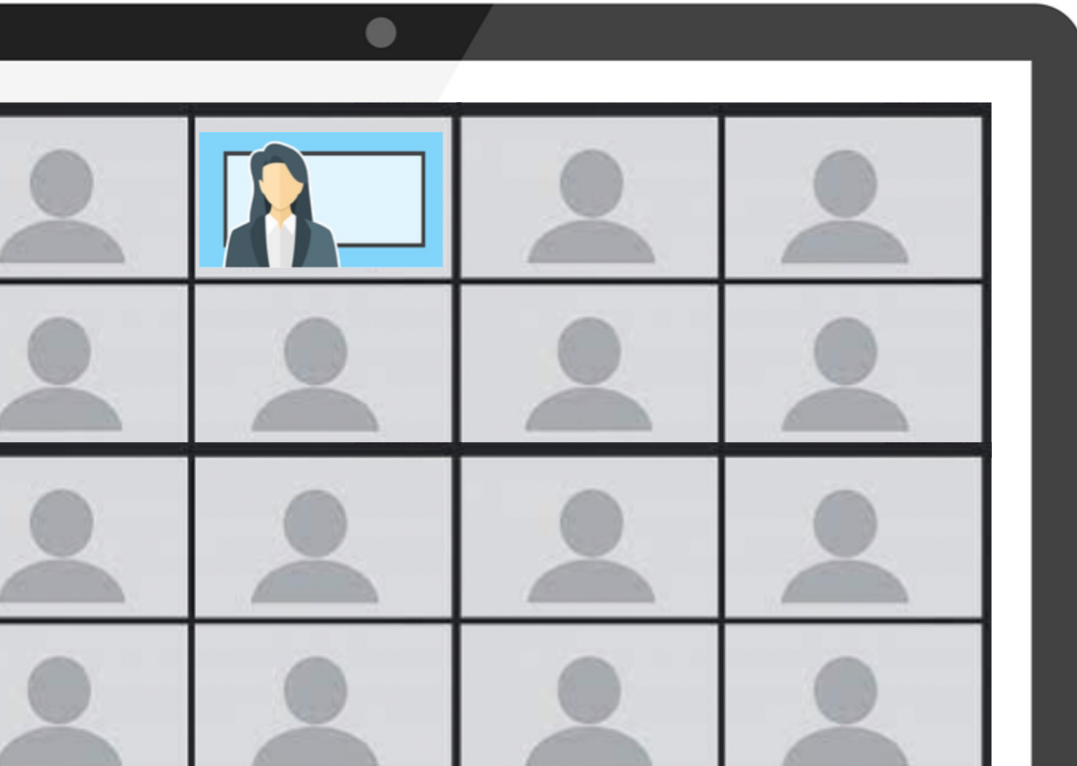
Online Teaching/Learning: Expectation

Online classroom:

- Two-way communication.
- Real-time presentation.



Online Teaching/Learning: Reality



Online video:

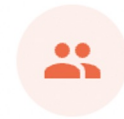
- One-way communication
- Static presentation

Challenges:

- Lacking real-time feedbacks for instructors.
- Minimal social presence.

Online Teaching/Learning: An observation

- Many feel uncomfortable showing their home or face.
- Thai students are shy and do not ask questions.
- **Anonymous** students **engaged** more in the class.



Active participants

201

Joined participants

230

Engagement score ?

309



Questions

243

Likes / dislikes

19 / 0

Anonymous rate

98%

*Data from ITCS343 at the Faculty of ICT (15 hours).

Virtual Classrooms

Environments



Representation

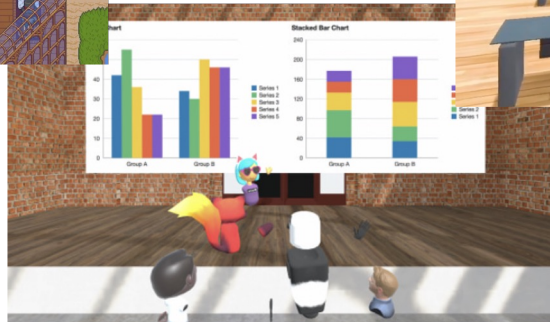
Dimensions of the virtual classroom Environments

1D

2D

3D

VR/A
R



Spatial awareness



Existing Applications: Virtual environment (w/o headset)

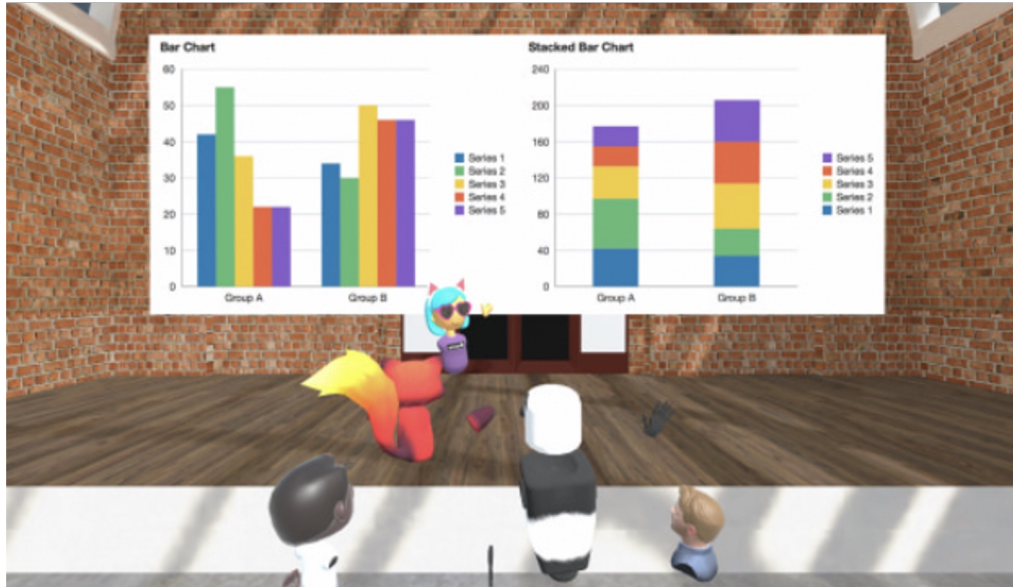


Gather Town

- Hybrid 2D and video conference.
- We can talk and listen to nearby people.

<https://gather.town/>

Existing Applications: Virtual environment (w/o headset)



Mozilla Hub

- Private 3D virtual spaces.

<https://hubs.mozilla.com/>

Existing Applications: Virtual environment (w/o headset)

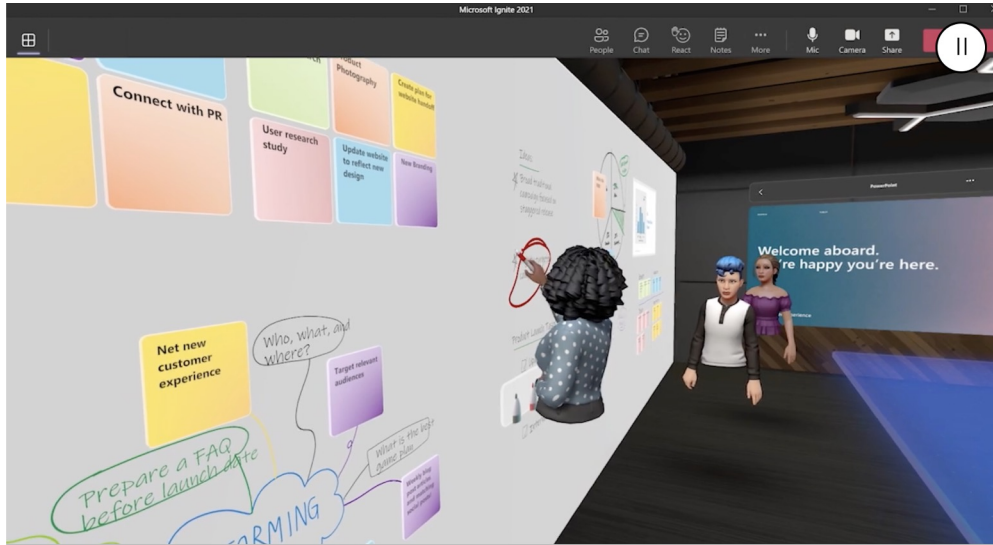


Virbela

- Used by other Universities:
 - EGADE Business School
 - UCSD + Waseda University
 - Davenport University

<https://www.virbela.com/solutions/remote-learning>

Existing Applications: Virtual environment



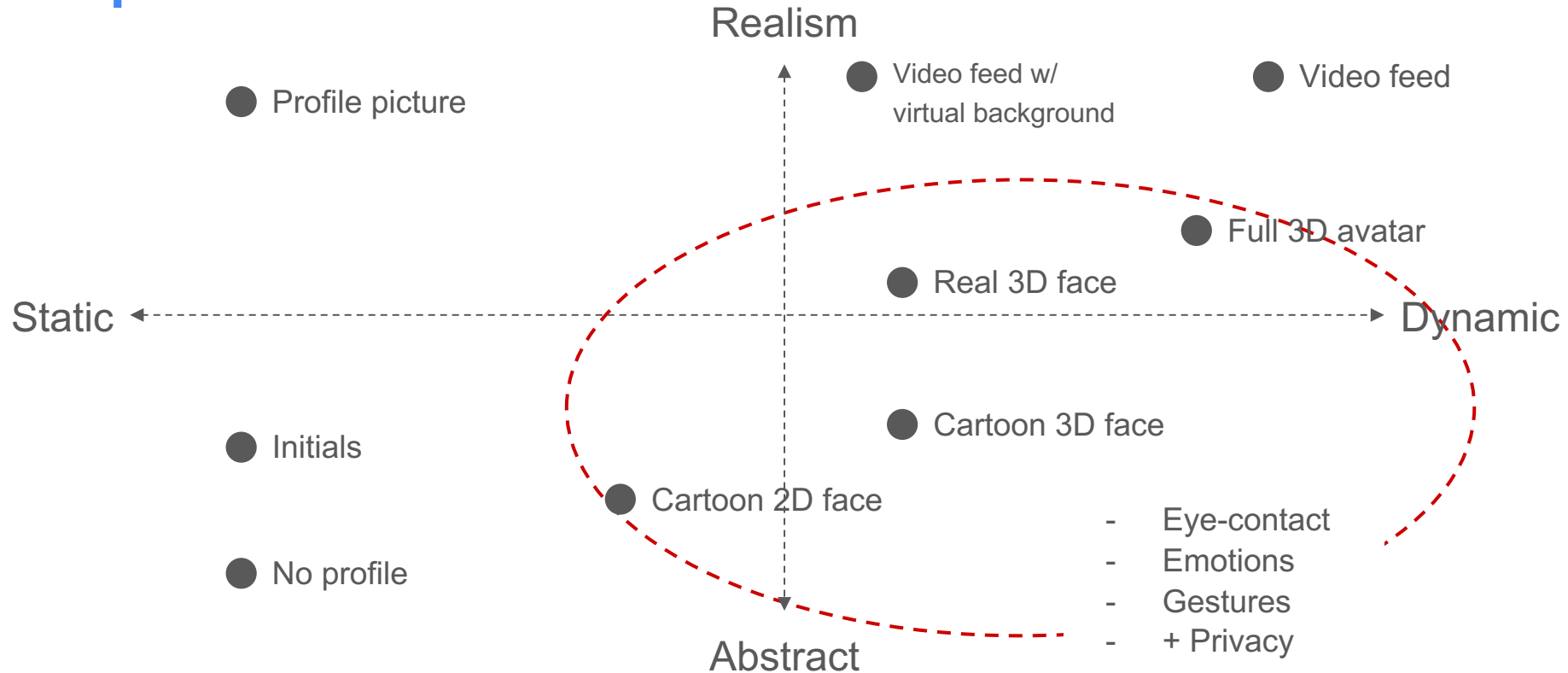
Microsoft Mesh

- Required significant investment in hardware
- AR/VR Interaction

<https://www.microsoft.com/en-us/mesh>

Dimensions of the virtual classroom

Representation



Existing Applications: Avatar Creation

ReadyPlayerMe

- Create virtual avatar from image.
- Export avatar to other applications.
(such as Mozilla Hubs and mostly VR apps)



<https://readyplayer.me/>

Existing Applications: Avatar Creation and Animation

Loom AI

- Create virtual avatar from image.
- Animate avatar from audio and face capture.
- Use with other meeting apps
- macOS and Windows
- ***No longer supported***

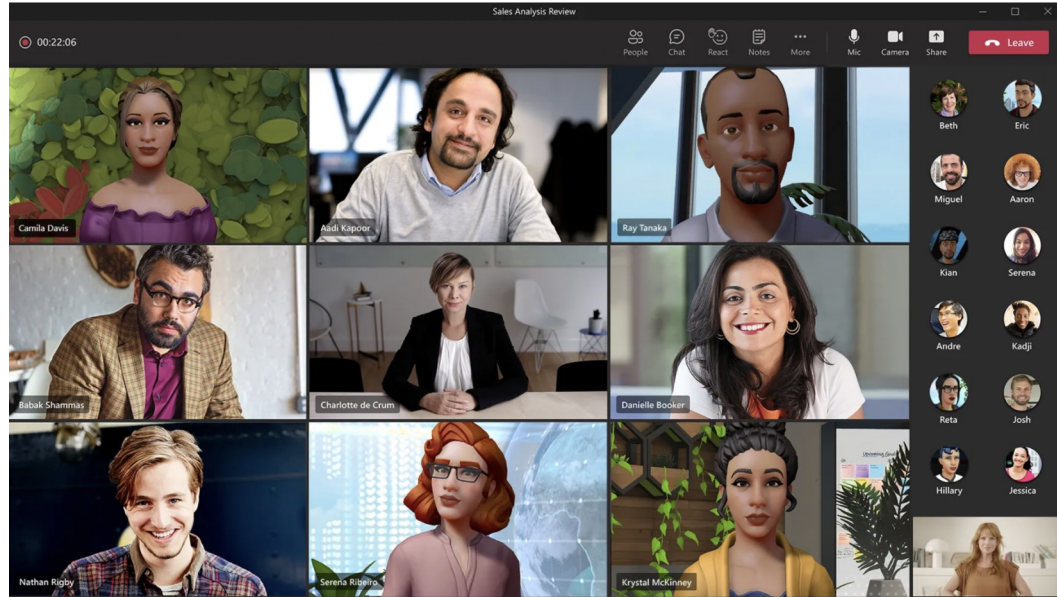


<https://loomai.com/loomielive>

Existing Applications: Avatar Creation and Animation

Microsoft Teams

- Part of the Microsoft Mesh project.
- Features remain to be seen.
- ***Not yet available***



<https://news.microsoft.com/innovation-stories/mesh-for-microsoft-teams/>

Existing Applications: VTuber

VTuber (many)

- Animate a virtual avatar using face capture.
- Commonly used in Game Streaming.
- Many supporting applications:
https://virtualyoutuber.fandom.com/wiki/List_of_VTuber-related_software_and_resources

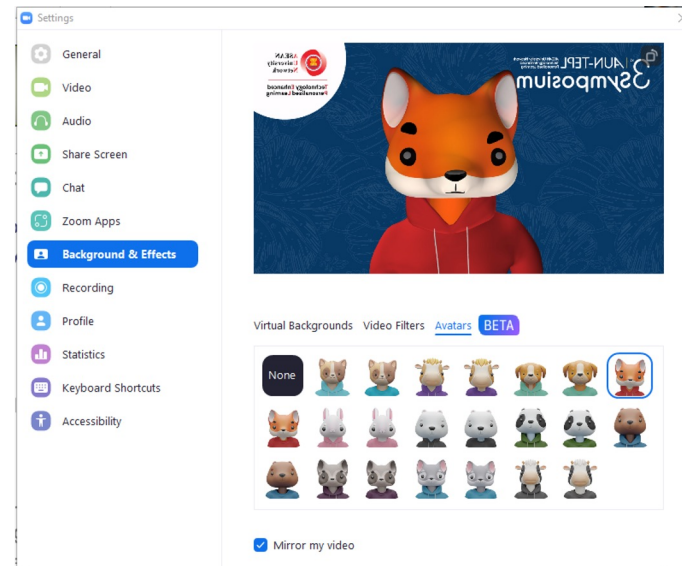


<https://live3d.io/>

Existing Applications: Zoom Avatar

Zoom Avatar

- Recent updated version of Zoom should be able to turn on Avatar feature!
- Zoom desktop client
 - Windows: 5.10.0 or higher
 - macOS: 5.10.0 or higher
- Zoom mobile app
 - iOS: 5.10.0 or higher

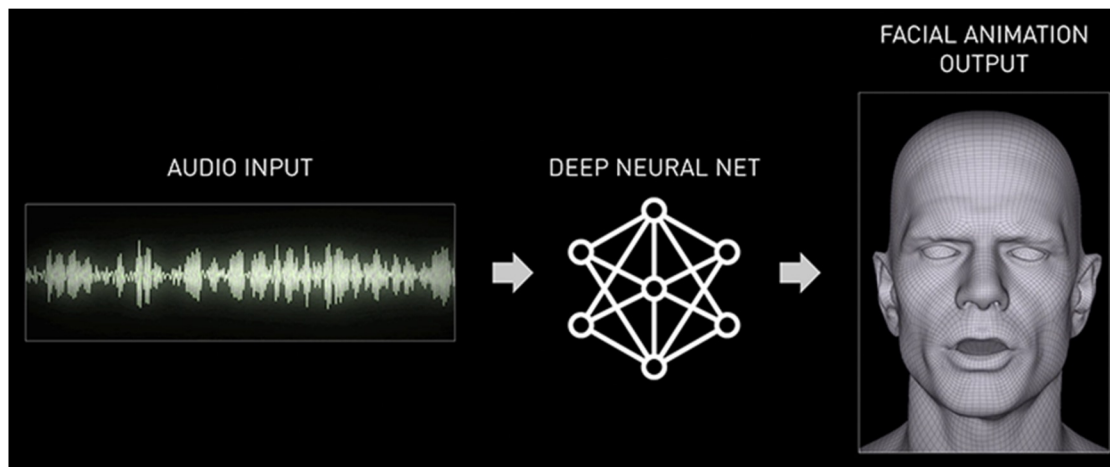


<https://support.zoom.us/hc/en-us/articles/4642184011917>

Advance Technology

NVIDIA Audio2Face

- Required NVIDIA GPU
- Focus on accuracy of the animation.
- Using a single photo to create a virtual avatar.

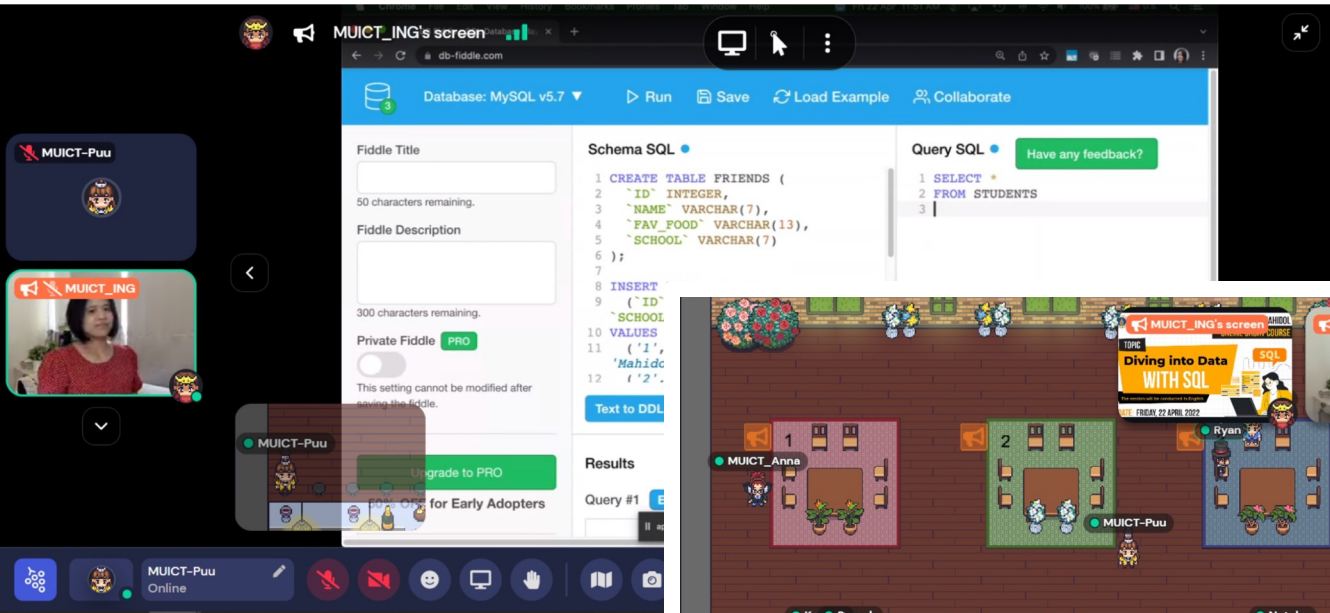


<https://www.nvidia.com/en-us/omniverse/apps/audio2face/>

Real Classroom Examples: Dr. Morakot and Dr. Chaiyong



Real Classroom Examples: Dr. Siripen



The screenshot shows a Zoom meeting window with a shared screen of a MySQL Fiddle interface. The interface includes a sidebar with a 'Fiddle Title' and 'Fiddle Description' field, a 'Schema SQL' editor with the following code:

```

1 CREATE TABLE FRIENDS (
2   `ID` INTEGER,
3   `NAME` VARCHAR(7),
4   `FAV_FOOD` VARCHAR(13),
5   `SCHOOL` VARCHAR(7)
6 );
7
8 INSERT
9   (`ID`
10  `SCHOOL`
11  VALUES
12   ('1',
13    'Mahidol',
14    '2').

```

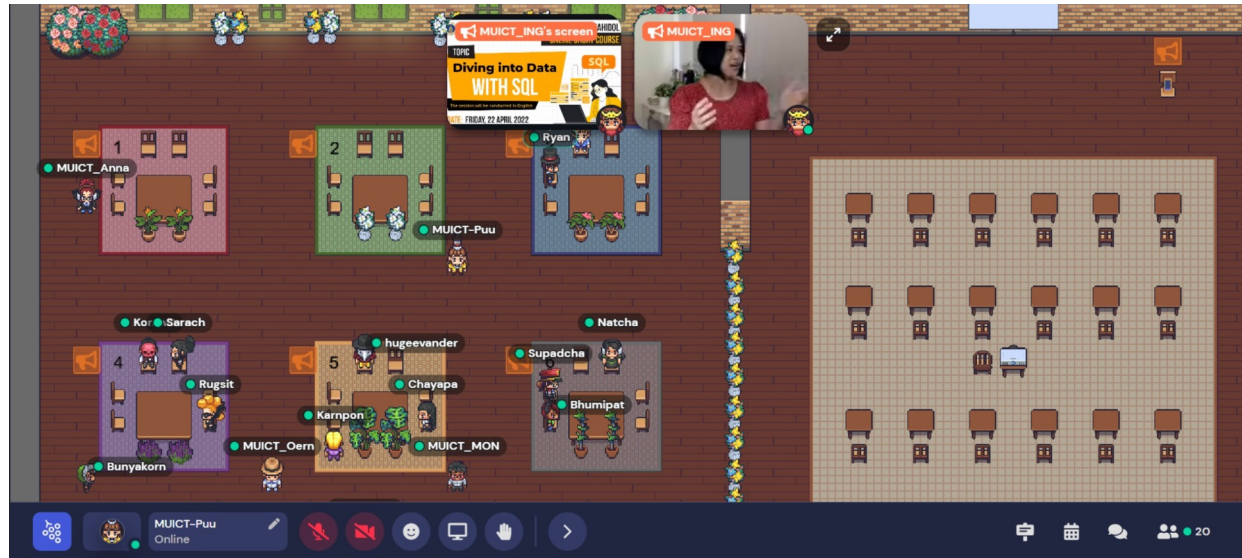
The 'Query SQL' editor contains the following code:

```

1 SELECT *
2 FROM STUDENTS
3

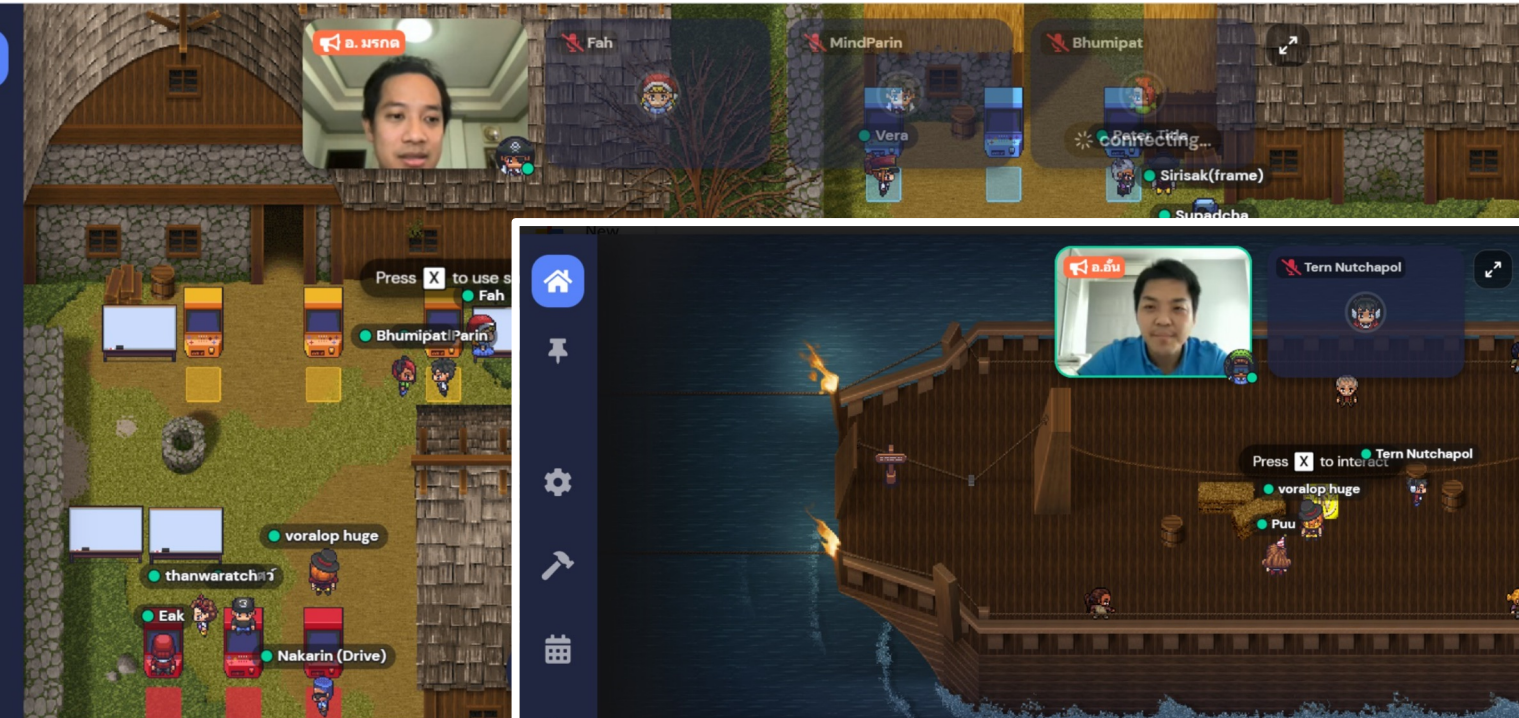
```

The 'Results' section shows 'Query #1' with a 'Text to DDL' button. A 'Private Fiddle' toggle is set to 'PRO'. A 'Zoom into Data WITH SQL' banner is visible in the background of the shared screen.

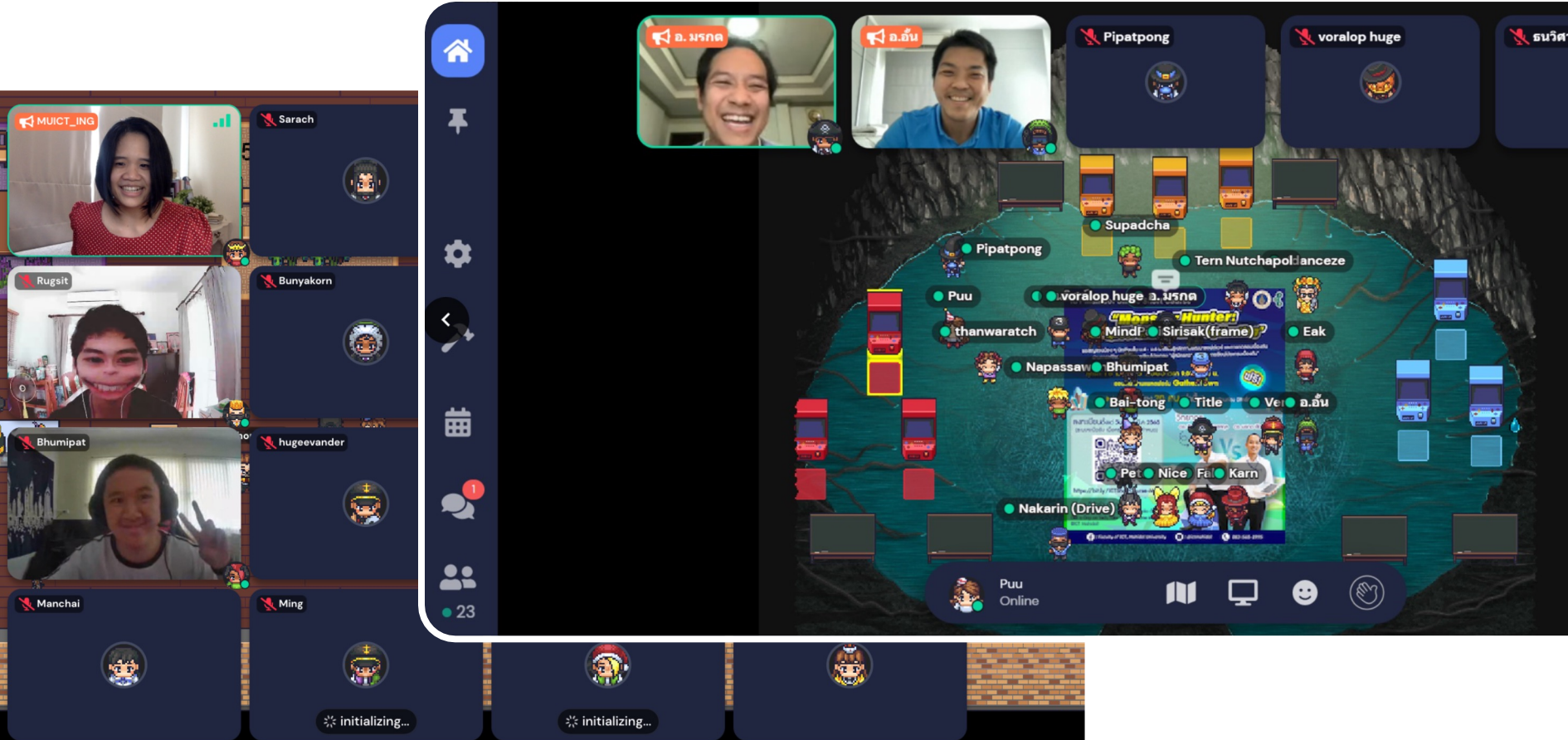


The screenshot shows a Zoom meeting window with a virtual classroom environment. The environment features a brick wall background, several tables with chairs, and a large grid of empty seats on the right. A banner for 'Zoom into Data WITH SQL' is visible. The meeting controls at the bottom show 'MUICT-Puu Online' and a '20' participant count.

Real Classroom Examples: Dr. Morakot and Dr. Chaiyong



Real Classroom Examples



Conclusion

- Online learning offers unique opportunities.
- Virtual classrooms could increase student engagement.
- There are several tools available for instructors and students.

- Open research questions:
 - *Suitable formats of virtual classrooms for teaching methods/styles*
 - *Effectiveness in terms of learning outcomes*