Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

WP 3 – Curriculum Development II: Modernisation of Teaching Methods and Tools for MSC Programmes

Outcome 3.3 - Vclass Online Learning Platform

Project Acronym:	MSIE 4.0
Project full title:	Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry
Project No.:	586137-EPP-I-2017-I-TH-EPPKA2-CBHE-JP
Funding Scheme:	Erasmus + KA2 - Capacity Building in the field of Higher Education
Coordinator:	AIT
Work Package:	WP3 – Curriculum Development II
WP Leader:	Huynh Trung Luong (AIT) & Rui M. Lima (UM)
Task Title:	Task 3.3 – Develop a web-portal for online learning platform
Task Leader:	Huynh Trung Luong
Last version date:	20/10/2020
Status:	Final
Dissemination Level:	Department - Institution – Regional – National - International

Disclaimer

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

REVISION SHEET

Version	Date	Author (Partner/Person)	The revision reason
1	25/02/2019	AIT / Huynh Trung Luong & Clifford M. Gasillos	First draft version of WP3_Task3.3 - Outcome 3.3
2	30/10/2019	AIT / Huynh Trung Luong & Clifford M. Gasillos	Modifications to fix the problem related to the use of Javascripts on web browsers
3	01/12/2019	AIT / Huynh Trung Luong & Clifford M. Gasillos	Modifications based on the comments of the participants in the training session
4	20/10/2020	AIT / Huynh Trung Luong & Clifford M. Gasillos	Incorporate the comments of lecturers and students during pilot tests

DISTRIBUTION LIST

Project Partner	Acronym	Responsible (for dissemination)
Chiang Mai University	CMU	Wichai Chattinnawat
Asian Institute of Technology	AIT	Huynh Trung Luong
King Mongkut's University of Technology North Bangkok	KMUTNB	Athakorn Kengpol
Thammasat University	TU	Wuthichai Wongthatsanekorni Wongtasa
Khon Kaen University	KKU	Thitipong Jamrus
Prince of Songkla University	PSU	Supapan Chaiprapat
University Politehnica of Bucharest	UPB	Bogdan Abaza
University of Minho	UMinho	Rui Lima
Częstochowa University of Technology	CUT	Tomasz Nitkiewicz

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

Table of Contents

List of Tables

List of Figures

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

1   Executive Summary

In this task, a web portal for adaptive e-learning purpose called Vclass is developed. It serves as a single access point for all online course materials, self-studying resources (e-books, scientific articles, reports of case studies), quizzes, assignments, and as an interface for discussion/interaction among students as well as between students and lecturers. This web portal will satisfy the following requirements:

- Give students access to learning materials and other useful information as well as student's services
- Allow students to interact with each other and with course's instructor
- Allow students and instructors to share information
- Provide an innovative teaching tool for instructors and an alternative learning tool for students.

The Vclass LMS (Learning Management System) is developed by AIT intERLab for course management, forum discussion, announcement, grading, etc. The BigBlueButton, an open source conference system, and it expanded version MCONF will be utilized for organizing web conferences.

2   Introduction

An online learning platform is a teaching and learning environment located within a computer-mediated communication system. In an online learning platform, all activities and interactions take place through the computer instead of face-to-face. A virtual classroom conducted on an online learning platform may involve three overlapping scopes of interaction technologies; i.e., virtual courses, online meetings and online presentations.

In an online learning platform, education refers to instruction in a learning environment where teachers and students are separated by time or place, or both. It is the place where students and instructors interact, and courses of entire degree programs can be electronically delivered in a whole or in separate modules via a combination of different teaching and learning methods. Usually, in this type of learning environment, students and teachers interact using internet.

A typical virtual classroom conducted on an online learning platform may contain:

1. Class activities
2. Group and individual learning activities
3. Discussion and chats with a students
4. Quizzes and surveys
5. Homework activities and assessment documents
6. Full online courses with modules of work
7. Forum and synchronous chat session

Conducting courses on an online learning platform can help to fulfil the learners' need in terms of

- Flexible time – students may participate at any time using their own agendas
- Location – students are not limited to courses offered in their geographic locations

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

For both teachers and students, courses conducted on an online learning platform provide many advantages:

1. Remove the need to travel to a location in which to participate/deliver the course lecture
2. The courses can be accessed from any computer/device with internet connection
3. The courses are accessible to students with physical disabilities, which is an advantage over the real classroom, as they can access it from home
4. Independent time schedule of attendance

The Vclass online learning platform developed under MSIE 4.0 project will serve the above requirements. This platform was developed at AIT and have been initially tested with 3 regular courses of ISE program at AIT, i.e., AT72.03 Statistical Models & Design of Experiments (August Semester, 2018 & August Semester, 2019), AT72.08 Stochastic Decision Models (January Semester, 2019), and AT72.05 Quality Control and management (August Semester, 2019). After that, a training session on the use of Vclass for faculty members from all Thai university partners was conducted at AIT to collect constructive comments to help revise the structure of the platform and to improve functional quality of some modules of the platform. The platform then has been tested with pilot test courses in MISE 4.0 project to collect feedback from lecturers and students who enrolled in those pilot test courses. Comments of lecturers and students from pilot test courses were then incorporated in the final version of the platform.

The general structure of Vclass contains the following modules:

- Home page
- Lectures
- Peer Grading
- Forum
- Access logs
- Grade system
- Grade category
- Grades
- Submission
- Groupings
- About

In the following section, introduction about the above modules together with guidance on how to use the platform will be presented.

3 Structure of Vclass Online Learning Platform

The general structure of Vclass contains the following modules:

- Home page
- Lectures
- Peer Grading
- Forum
- Access logs
- Grade system
- Grade category
- Grades
- Submission

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

- Groupings
- About

In the following section, brief introduction about the above modules of the platform will be presented. The details about the structure of the platform as well as Instructor/Student Interface are presented in Annex I (Teacher Manual) and Annex II (Student Manual) of this report.

3.1   Home Page

On the home page of a course, the following information can be seen:

- Recent announcements
- Learning documents/Lectures recently uploaded

New announcement can be posted by use of "Post Announcement" function

3.2   Lectures Module

In lectures module, the lecturers can upload lectures (e.g., ppt presentation files), live videos & recordings, and documents such as pdf and word files. Video conferencing function is also available in this module by declaring the type of lecture. In general, there are two types of lectures provided in this module:

- Content file – for documents, ppt, pdf, etc.. and video recording lectures
- Live Lecture – for live class using video conferencing system

The duration of time where a lecture is available for accessing and the score category, which can be used later for grading purpose, can also be declared in this module

3.3   Peer Grading Module

The Peer Grading Menu is available on the Student Interface where the students can look for their grade in the categories of the course where peer grading is applied (such as group assignments, group projects). The student may evaluate themselves and co-member in this module. The instructor can see the Peer Grading results from students when accessing the Grades Module.

3.4   Forum Module

In the forum module, the teacher can create different rooms for communication with students and among students (e.g., Discussion, Asking for Help, etc.). Activities happened in this forum module can be observed and monitored in real time.

3.5   Access Logs Module

In this module, the number of times a student accessed a specific session of the course is recorded. By clicking on the name of a student, the duration of time he/she spent in each access is also presented.

3.6   Grade System Module

In this module, the grading system (i.e., A, B+, B,…) used for the course will be defined based on the cumulative percentage a student received at the end of the course. The tentative grade of a student will be automatically determined following the grading system defined in this module based on their performance in different grading criteria of the course (e.g., home assignment, individual/group projects, presentation, exams, …).

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

3.7   Grade Category Module

In this module, the contribution percentages of different grade categories which will be used to derive the tentative final grade of students are defined.

3.8   Grades Module

In this module, the tentative final grade of the students will be defined based on the weighted cumulative percentage of all performance criteria. However, the final grade can be adjusted by the lecturers.

3.9   Submission Module

In this module, if the lecturer has created/assigned a submission in Lectures Module for home assignments/group project reports under his/her lecture session, then the lecturer can view the submitted files of all students in this module.

3.10   Groupings Module

In this module, the instructor can create groups and assign/reassign students in various groups for group assignments/group projects.

3.11   About Module

In this module, basic information about the course (e.g., course objective, course learning outcomes, etc.) are presented.

4   Training Session on Vclass Online Learning Platform

A one-day training session on the use of Vclass for faculty members from all Thai university partners was conducted at Asian Institute of Technology (AIT) to help members from all partners to get familiar with this learning platform and to collect constructive comments from the participants to help revise the structure of the platform and to improve functional quality of some modules of the platform. The training was conducted on November 29, 2019. Nine faculty members from Chiang Mai University, Prince of Songkla University, Thammasat University, King Mongkut University of Technology North Bangkok and Khon Kaen University have joined the training. The following core concepts were covered in the training program:

- ❖ Familiarize the structure of V-Class and it's function
- ❖ Create session & sub-session in lectures module
- ❖ Create folder & sub-folder in file manager
- ❖ Uploading files in file manager
- ❖ Attaching files in lecture module
- ❖ Parameters in editing session module
- ❖ Peer Grading (Instructor/Student Interface)
- ❖ Online Class session (Instructor/Student Interface)

At the end of the training, a questionnaire survey has been conducted (see Annex III for the detailed questionnaire) and the results are summarized in Table 1 below:

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

Table 1. Summarized results of survey on Vclass training

	1 Totally Disagree	2 Disagree	3 I am not sure	4 Agree	5 Totally Agree
a) The training was useful and relevant for the project activities.				3	6
b) I understood the concepts presented in the training.				2	7
c) The issues presented in the training were relevant for my teaching practice.				5	4
d) I had an active participation during the training activities.				5	4
e) The trainers had an effective approach during the activities developed.			2	2	5
f) The training materials used were useful for the project activities.			1	5	3
g) The training was valuable experience for professional growth.			2	3	4
h) I will recommend this training to somebody else.		1		5	3

From the survey, it can be concluded that the training is useful. In addition, the following aspects of the training ae considered positive:

- Online Class Lecture
- Clear explanation
- Suitable
- Class Grading
- Good Training
- The way we can make online teaching

Also, there are some constructive comments that help to modify and improve the Vclass learning platform before launching for pilot test. Those comments are:

- Limitation on how students can see their score
- The way we can check status of student
- Add more V-Class functions such as the progress score of student that can be seen during the class
- Students should able to see their scores.

The above comments have been addressed before the platform was tested with some pilot courses in the project.

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

5   Feedbacks from Students in Pilot Test Courses about Vclass

The Vclass online learning platform has been tested with some pilot test courses in the MSIE 4.0 project and a survey has been conducted to see the responses from the students. The questionnaire survey conducted on students has 10 questions (see Annex IV) using the Likert scale from 1 to 5 in which 1 means "strongly agree" and 5 means "strongly disagree". There are 49 students joining the survey and the responses are presented in the following figures
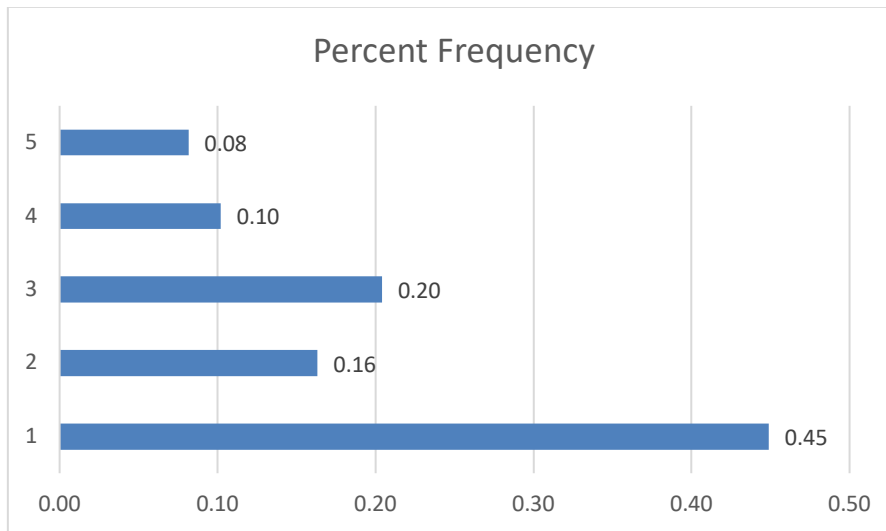

Figure 1. Student's responses on the question "V-class is user friendly (on Mobile/Ipad/Tablet/PC)"
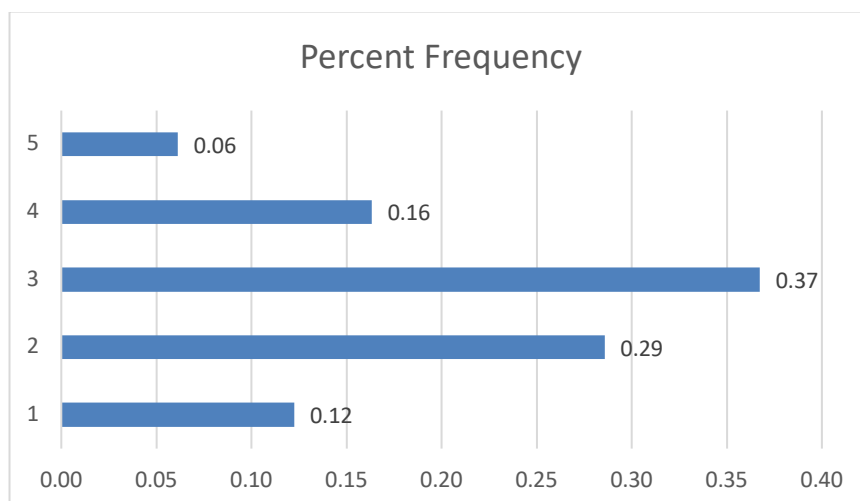

Figure 2. Student's responses on the question "I was more successful in this course than I am in other courses taught without using this platform or similar ones"

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

Percent Frequency

Score	Value
5	0.04
4	0.19
3	0.27
2	0.27
1	0.23
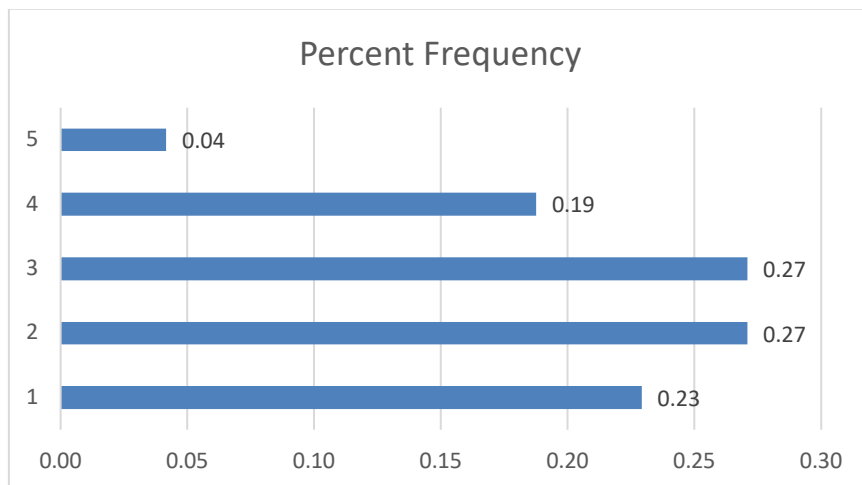
Figure 3. Student's responses on the question "I participated as much as I would in this course thanks to the use of Vclass"

Percent Frequency

Score	Value
5	0.06
4	0.12
3	0.20
2	0.18
1	0.43

Figure 4. Student's responses on the question "Announcement feature helps me to keep being informed in my enrolled course"

Percent Frequency

Score	Value
5	
4	0.21
3	0.31
2	0.21
1	0.27

Figure 5. Student's responses on the question "Discussion thread helps me in my self-paced study"

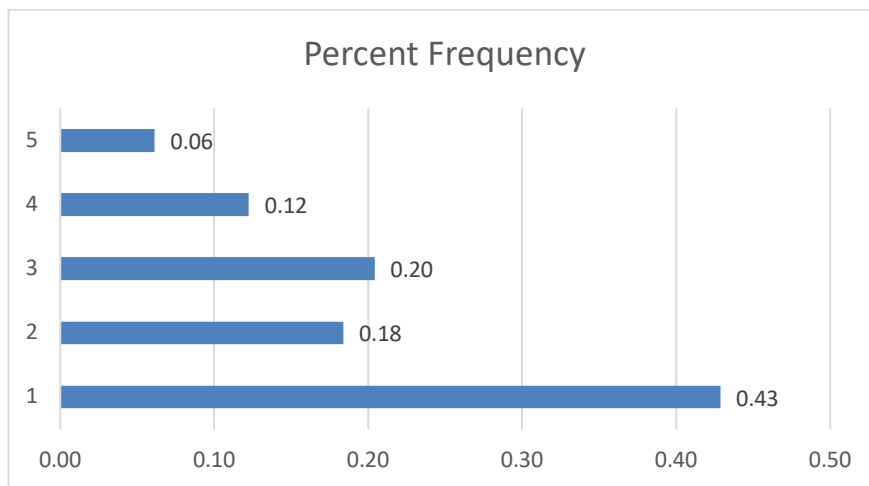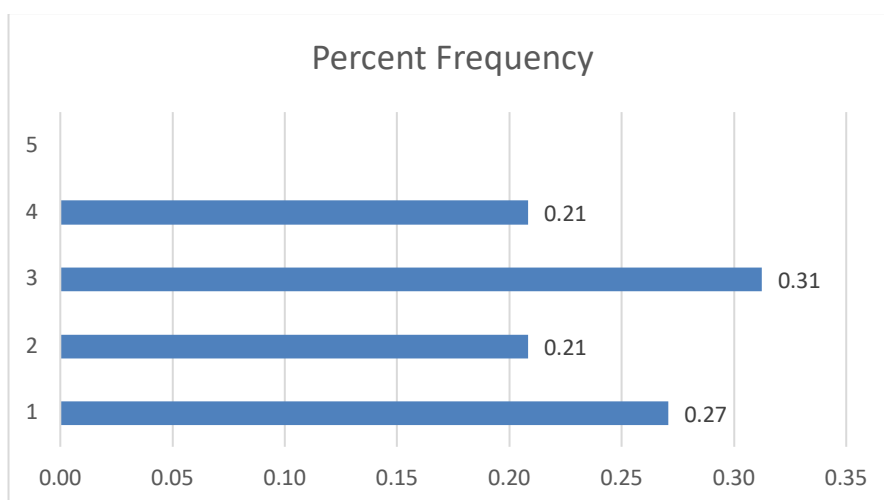**Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0**

Co-funded by the Erasmus + Programme of the European Union

Percent Frequency

Rating	Value
5	0.08
4	0.10
3	0.37
2	0.31
1	0.14
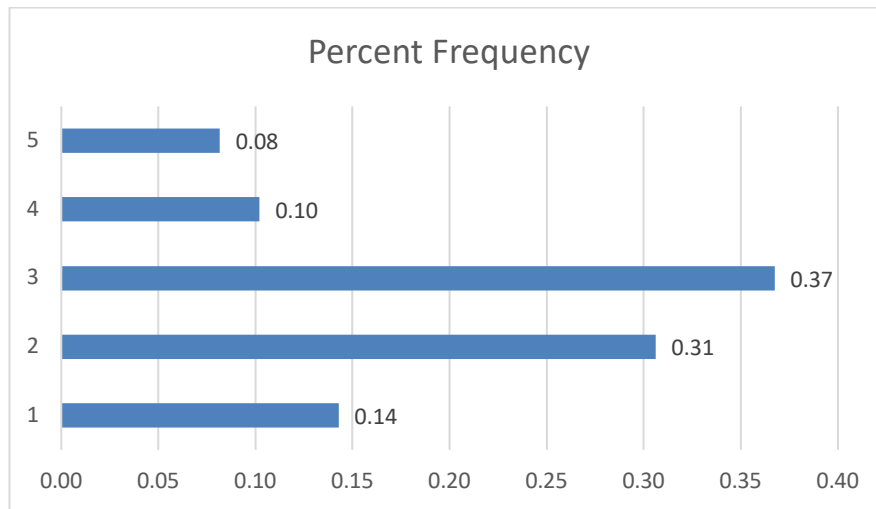
Figure 6. Student's responses on the question "Submission of assignments was simple and easy"

Percent Frequency

Rating	Value
5	0.06
4	0.17
3	0.21
2	0.17
1	0.40

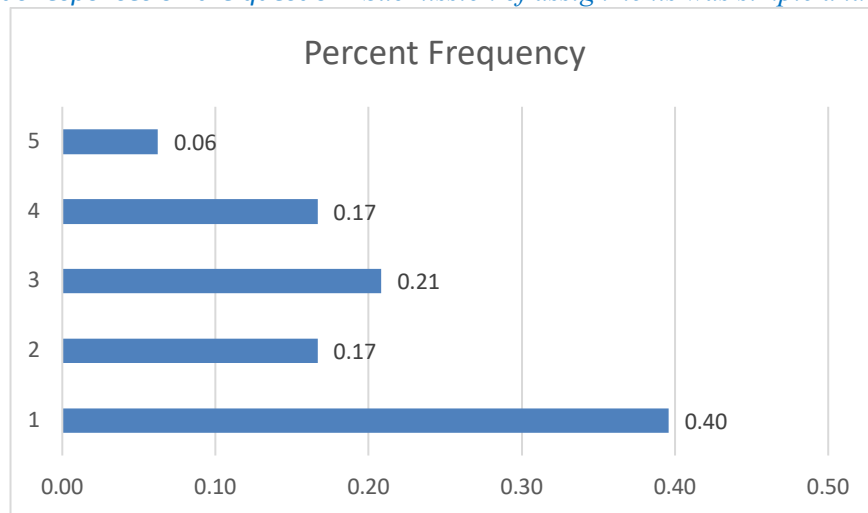*Figure 7. Student's responses on the question "Recorded video session helps me to review previous session"*

Percent Frequency

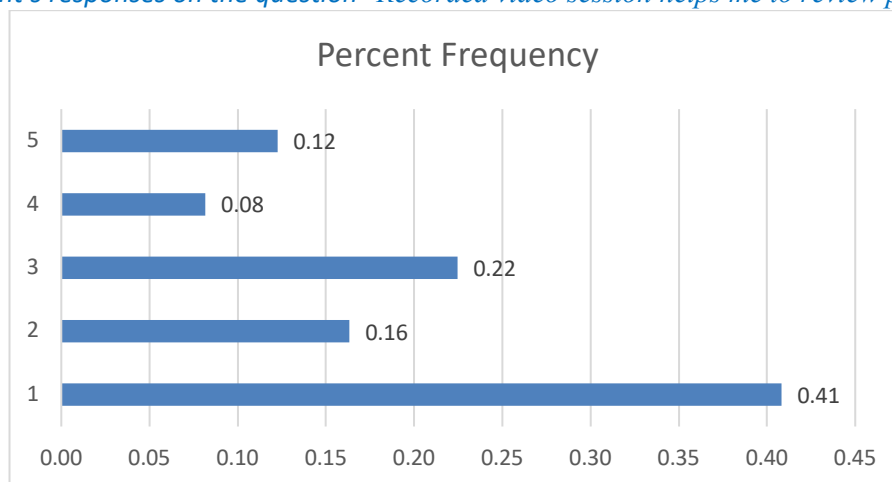| Rating	Value
5	0.12
4	0.08
3	0.22
2	0.16
1	0.41

Figure 8. Student's responses on the question "Convenient access to course materials for students(e.g., syllabus, outlines, notes, presentations, etc.)"
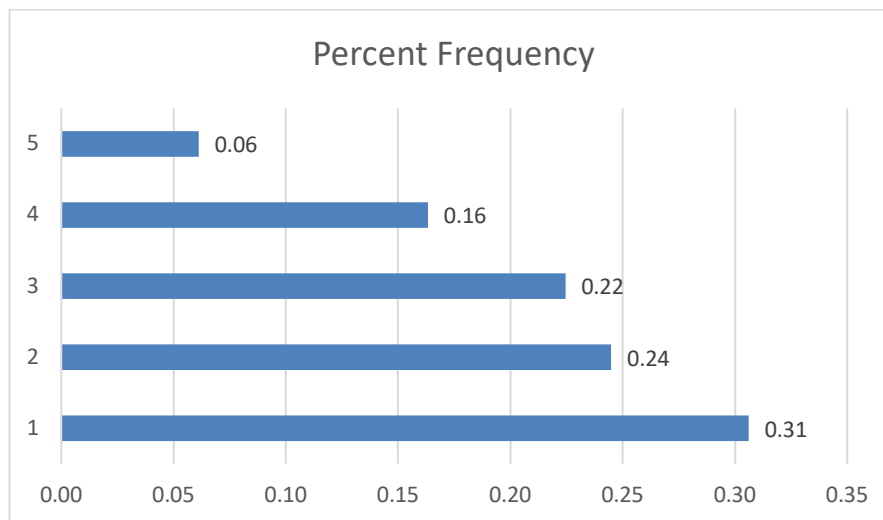
Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

Percent Frequency

Scale	Value
5	0.06
4	0.16
3	0.22
2	0.24
1	0.31

Figure 9. Student's responses on the question "Work group grading system has fairness and confidentiality"

Percent Frequency

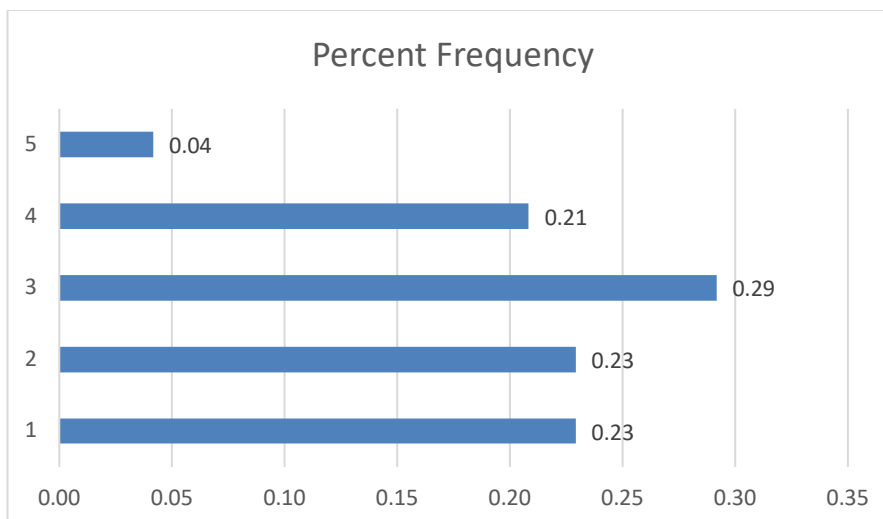| Scale	Value
5	0.04
4	0.21
3	0.29
2	0.23
1	0.23

Figure 10. Student's responses on the question "Having video conferencing can fulfill the absence of face-to-face interaction with lecturer"

From the survey results, it can be seen that most students appreciate and are satisfied with the use of Vclass in the courses they enrolled.

6   Feedbacks from Lecturers in Pilot Test Courses about Vclass

The questionnaire survey conducted on lecturers has 11 questions (see Annex V) using the Likert scale from 1 to 5 in which 1 means "strongly agree" and 5 means "strongly disagree". There are 7 faculty members joining the survey and the responses are presented in the following figures
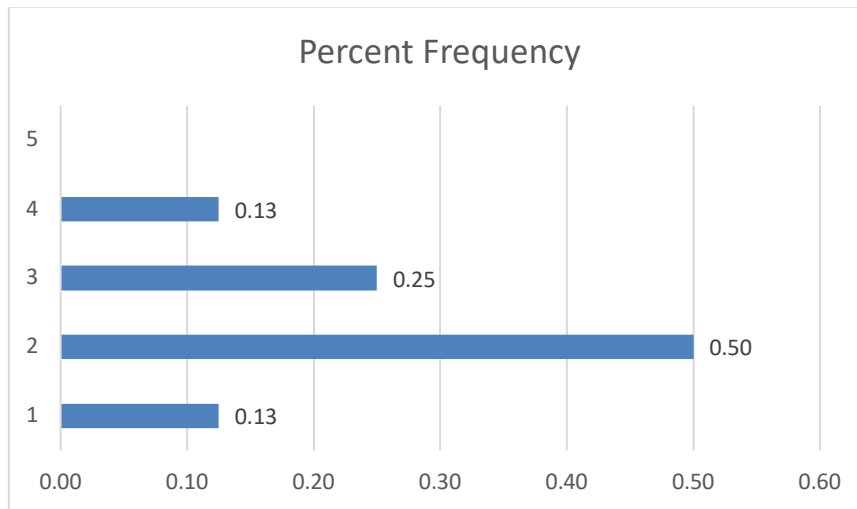
Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

Figure 11. Teacher's responses on the question "The platform helps you to design and teach a course online effectively"
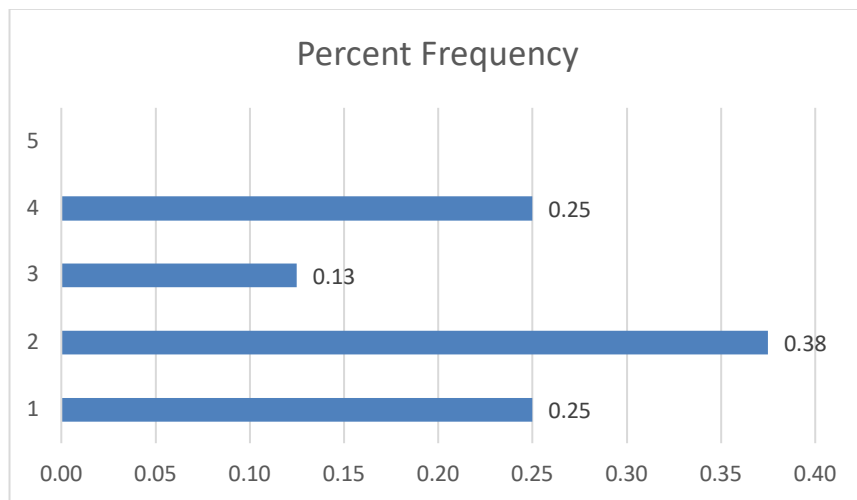

Figure 12. Teacher's responses on the question "Students have adequate access to participate effectively in online courses"
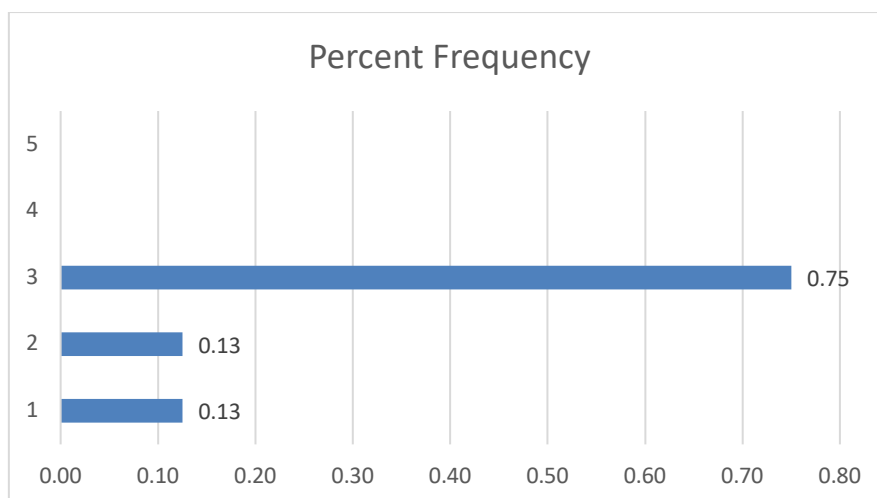

Figure 13. Teacher's responses on the question "Constructing an online course is not complicated"
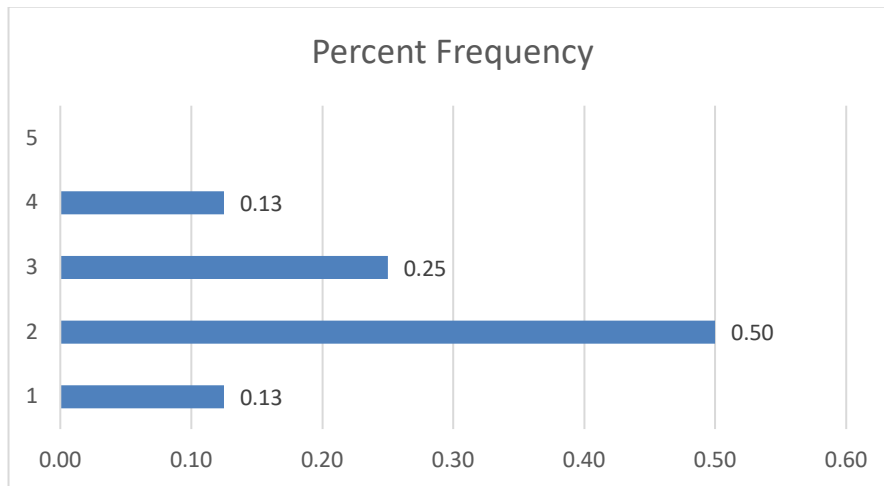
Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

Percent Frequency

Figure 14. Teacher's responses on the question "Announcement feature helps my students to keep being informed about my course"

Percent Frequency
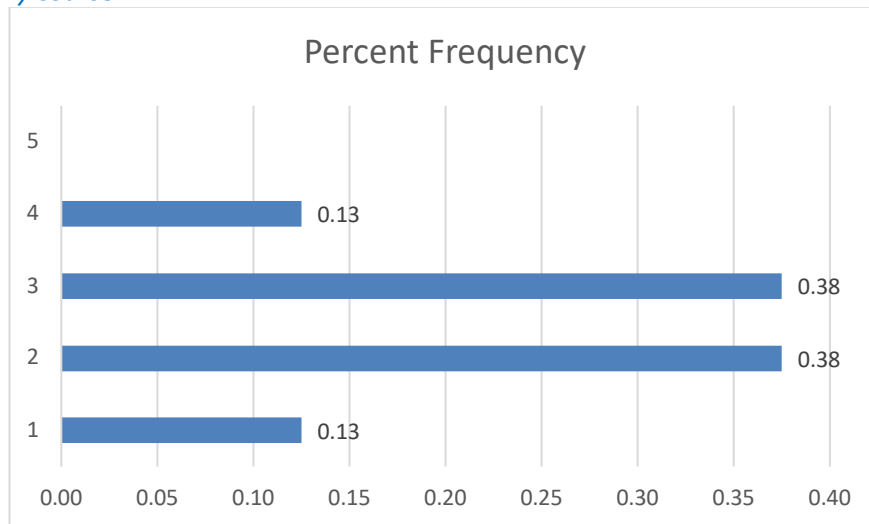
Figure 15. Teacher's responses on the question "Discussion thread helps me and my student to address questions offline"

Percent Frequency
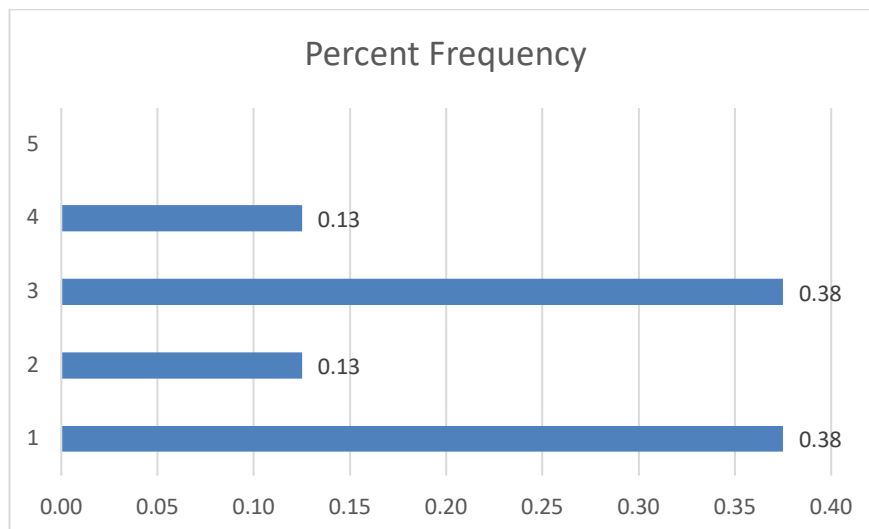
Figure 16. Teacher's responses on the question "Uploading teaching materials is easy"

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

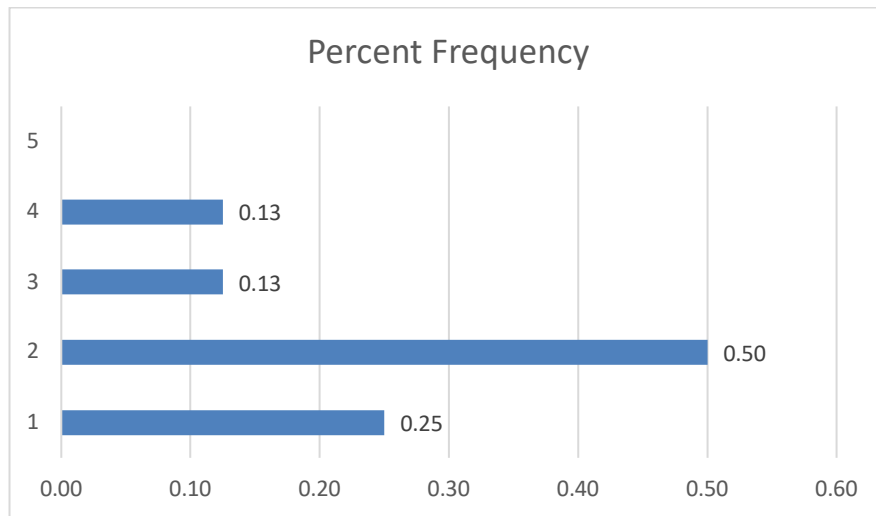**Co-funded by the Erasmus + Programme of the European Union**

Figure 17. Teacher's responses on the question "Instructor can easily monitor the access of enrolled student under his/her course"
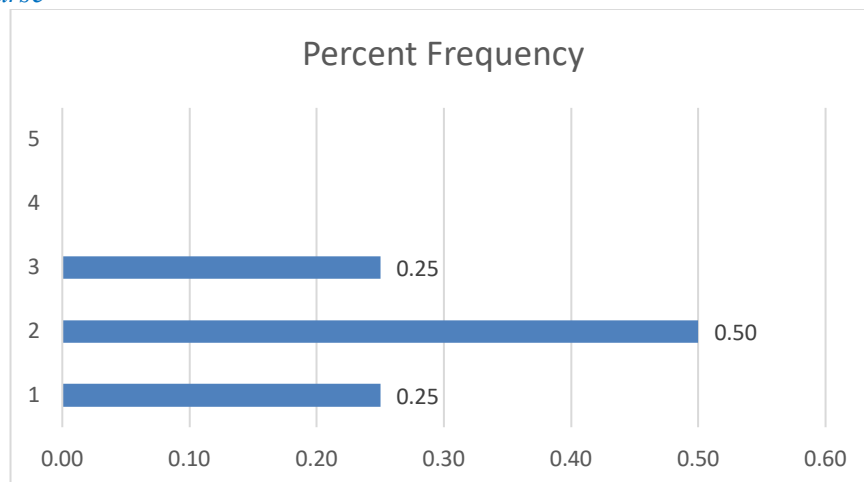

Figure 18. Teacher's responses on the question "Convenient access to course materials for instructor and students (e.g., syllabus, outlines, notes, presentations, etc.)"
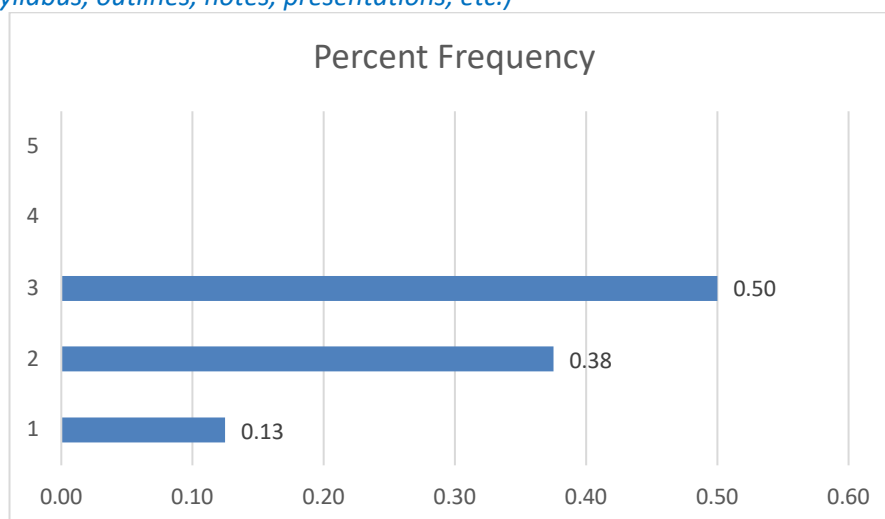

Figure 19. Teacher's responses on the question "Flexibility for grading system and grade category"

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
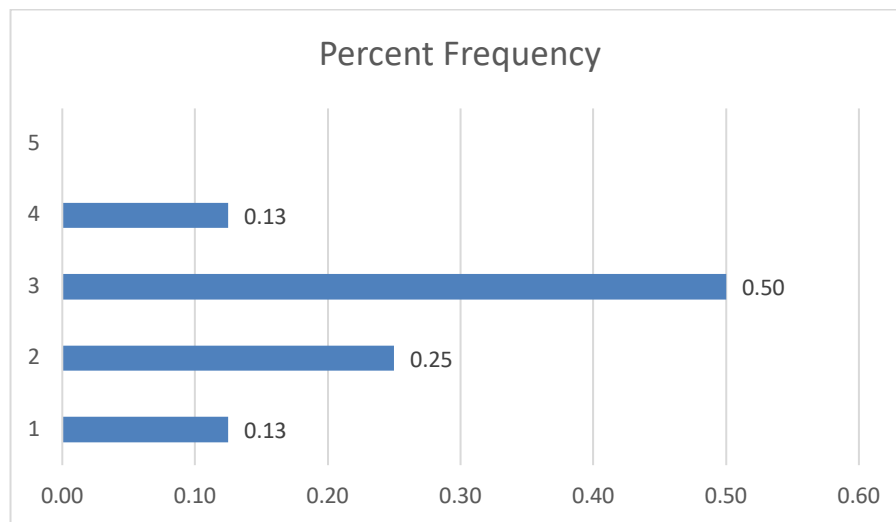of the European Union

Percent Frequency

Figure 20. Teacher's responses on the question "Having video conferencing can fulfill the absence of face-to-face interaction with students"

Figure 21. Teacher's response frequency on online features of Vclass

From the survey results, it can be seen that the final version of Vclass is also highly appreciated by the lecturers who used it in pilot test courses.

7   Concluding remarks

An online learning platform called Vclass have been developed successfully under MSIE 4.0 project. In the project, 9 out of 16 developed courses can be offered using online mode or hybrid online-offline mode. The materials of these 9 courses will be available on Vclass after project completion so that partner universities can utilize these materials and Vclass to offer those courses or some modules of those courses not only for regular master programs but also for professional/executive master programs at their institution where the use of online study mode cannot be avoidable due to time restriction of participating students.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

ANNEX I:

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry

Teacher Manual

for Virtual Classroom

**Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0**

**Co-funded by the
Erasmus + Programme
of the European Union**

CONTENT PAGE

1. Requirements

* ❖ You must be current enrolled from the institute.
* ❖ Username and password provided by the institute
* ❖ Laptop, Desktop or mobile devices with internet connection

2. Accessing Virtual Classroom

Login via following link: http://msie.Vclass.net/

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

3. What's inside of our virtual classroom

3.1 Home Page
Recent announcement, lectures and file upload will be posted here

3.2 Lectures
Create your own directory structure of lectures and attached some documents.

3.3 Forum
Teachers are allowed to create multiple discussion thread and category.

3.4 Access Log
Use to monitor the page view per lectures

3.5 Grading System
Create/Modify your own grading system here.

3.6 Grade Category
Assign grade percentage per assignment, mid-term and final exam.

3.7 Grades
View the grades of your student and can download in .csv file

3.8 About
You can put more information here for your course.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

4. Adding Lectures

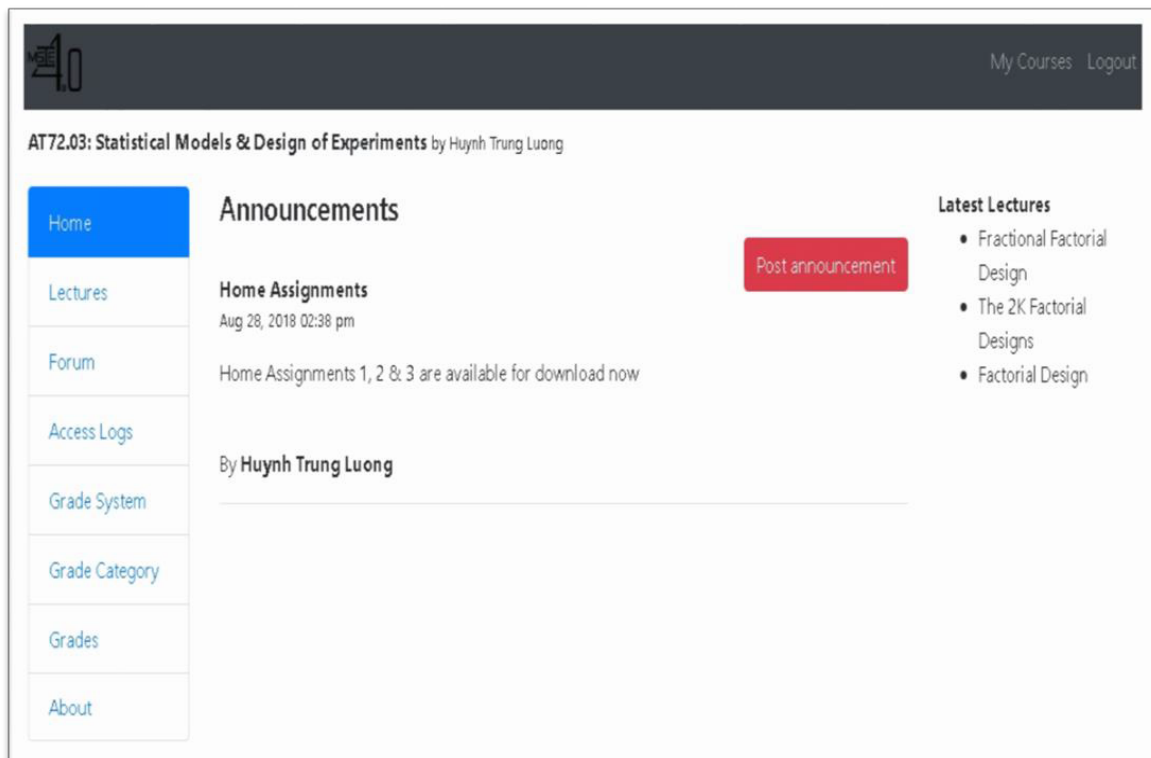## To add lectures, do the following

1. Click edit mode.

   AT72.05: Quality Control and Management by Huynh Trung Luong

Home	Edit Mode
Lectures	
Forum	

   Lectures

   1. Introduction to Quality Control

      1.1. Approaches to Defining Quality
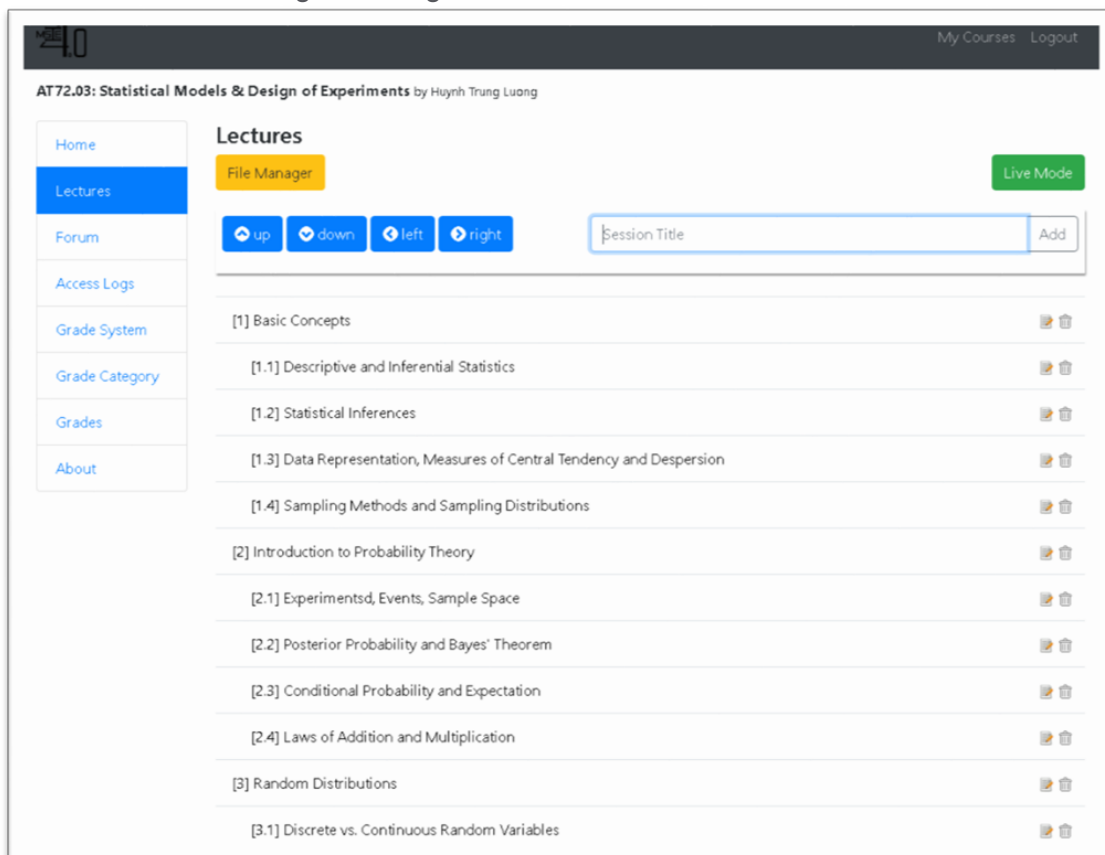
2. On the session title box, type your desired lecture title and click add button

   Lectures

   File Manager   Live Mode

   ▲ up | ▼ down | ◀ left | ▶ right | Session Title | Add

   [1] Introduction to Quality Control
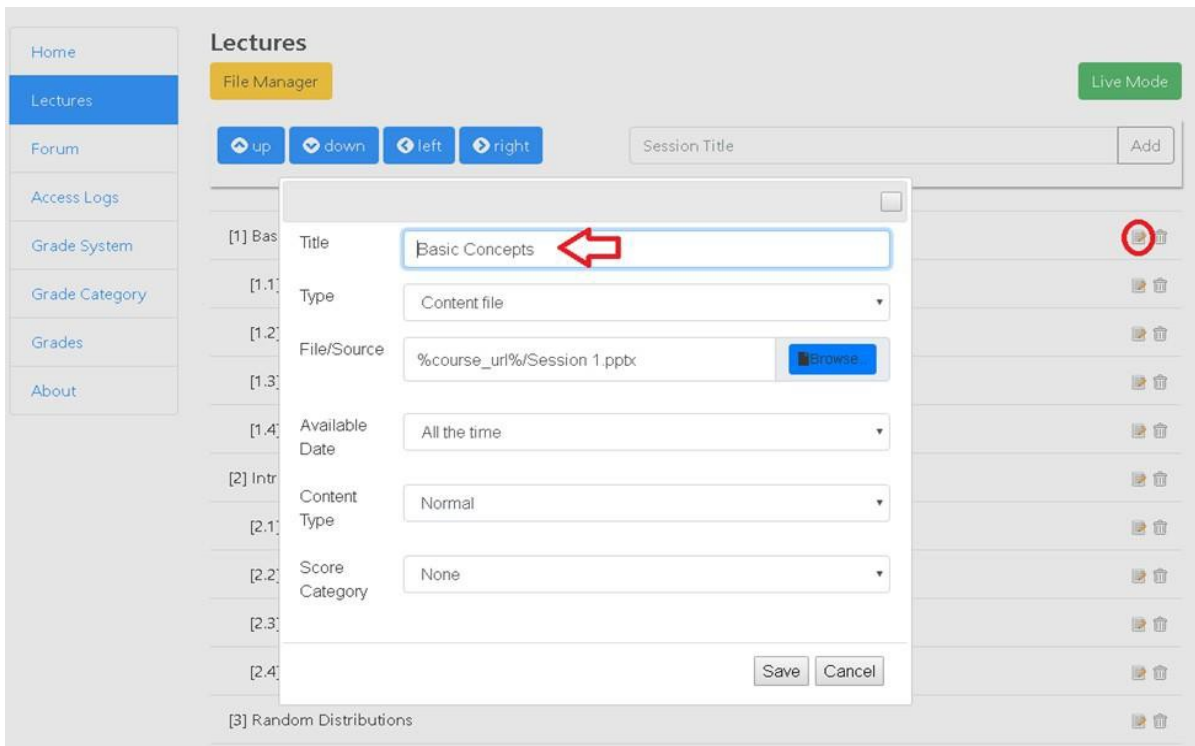
3. You may use arrow up and down to arrange the sequence of your lectures.

4. While arrow left and right to assign folder/sub-folder.

   AT72.03: Statistical Models & Design of Experiments by Huynh Trung Luong

   Lectures

   File Manager   Live Mode

   ▲ up | ▼ down | ◀ left | ▶ right | Session Title | Add

   [1] Basic Concepts

      [1.1] Descriptive and Inferential Statistics

      [1.2] Statistical Inferences

      [1.3] Data Representation, Measures of Central Tendency and Dispersion

      [1.4] Sampling Methods and Sampling Distributions

   [2] Introduction to Probability Theory

      [2.1] Experimentsd, Events, Sample Space

      [2.2] Posterior Probability and Bayes' Theorem

      [2.3] Conditional Probability and Expectation

      [2.4] Laws of Addition and Multiplication

   [3] Random Distributions

      [3.1] Discrete vs. Continuous Random Variables

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

5. Editing Lectures

To edit lectures, do the following

1. From edit mode.

2. Click the edit icon that encircle red from below image.

3. On the pop-up window edit the session title or lectures title.

4. On type field there are 2 types

   - Content file – for documents, pdf, and video recording class
   - Live Lecture – for live class using video conferencing system

5. Click browse if you select the content file from step 4 and you need to browse the

document from file manager.

6. Available Date – Set the date of your live class or availability of lecture notes.

7. Content type by default is set to Normal.

8. Score category you may specify here the lectures title if under grade category.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

6. Uploading Document in File Manager

To upload files, do the following
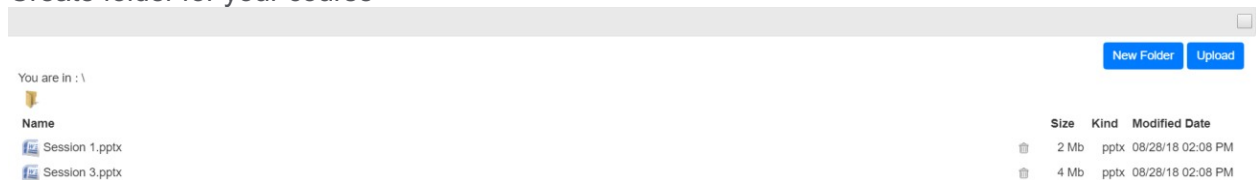
1. Enter in edit mode.

2. Click file manager

AT72.05: Quality Control and Management by Huynh Trung Luong

Home	**Lectures**
Lectures	File Manager
Forum	
Access Logs	⬆ up ⬇ down ◀ left ▶ right Session Title Add
Grade System	
Grade Category	[1] Introduction to Quality Control
	[1.1] Approaches to Defining Quality

Live Mode
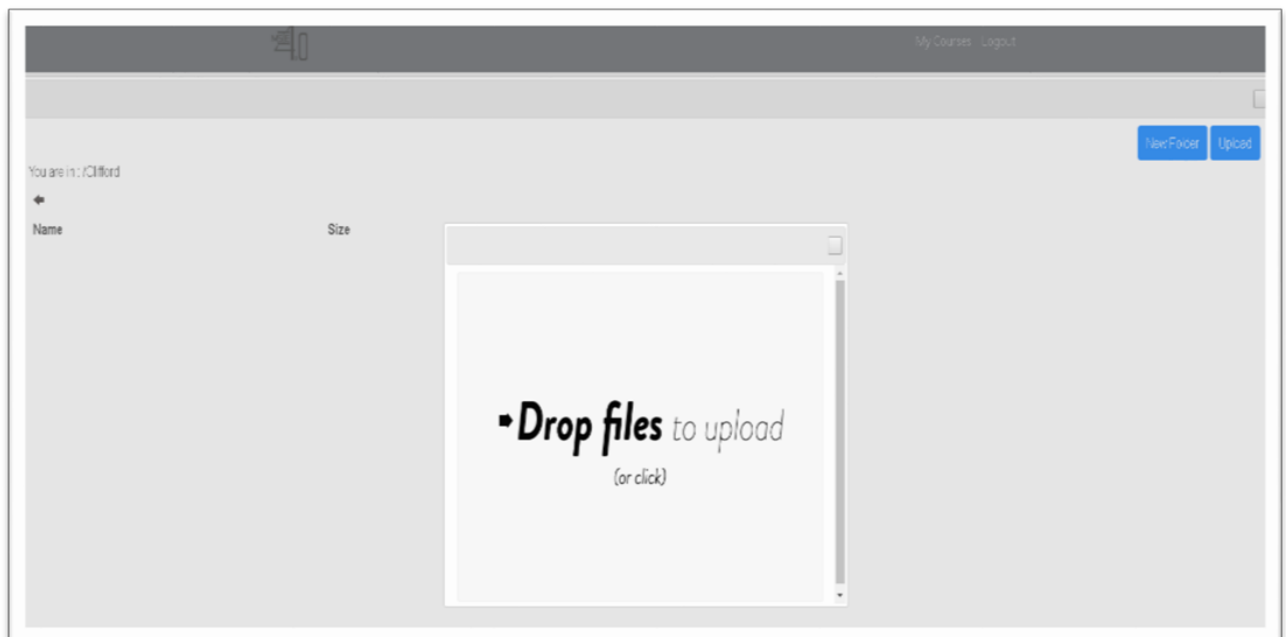
3. Create folder for your course

New Folder Upload

You are in : \

Name		Size	Kind	Modified Date
Session 1.pptx	🗑	2 Mb	pptx	08/28/18 02:08 PM
Session 3.pptx	🗑	4 Mb	pptx	08/28/18 02:08 PM

4. Click the created folder on step 3 and click upload

My Courses Logout

New Folder Upload

You are in : /Clifford

Name Size

•**Drop files** to upload

(or click)

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

7. Introduction Video Conference

Big Blue Button is used in our virtual classroom or online web conferencing session. Virtual classroom sessions are to deliver a high quality learning experience to remote student. When logged into the virtual classroom, users have the option of sharing their video and audio over the web using built-in or external devices. Multiple participants and a presenter can be sharing their video and audio at the same time.

Moderator is the person who handles the conference. The moderator has complete control over all functionality within the Big Blue Button session. Moderator will be able to mute, un-mute and eject any of the participant at any time. Members can handle only their own video/audio. All members of the virtual classroom can take part in a group chat or private chat.

7.1 Flash player

You need to have a web browser capable of running Flash 10.3 to get access to the BBB virtual classroom.

Click on the link below and follow the steps to check the flash player version installed on your computer, to find the latest version available for your computer or to download and install flash player.

To check Adobe Flash player : go to their website

7.2 Internet speed

Your internet connection must have the following upstream and downstream to participate successfully with virtual classroom.

Upstream: 500 Kbits/sec (0.5 Mbits/sec)

Downstream: 1000 Kbits/sec (1 Mbits/sec)

7.3 Java runtime

You will need to install java runtime to run the desktop sharing. Visit The Java website to test the currently installed version of java. You can download update java runtime free of charge.

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

7.4   Hardware requirements

For Windows computers recommended hardware requirement is Dual-core CPU with at least 2G memory (RAM).

For Mac computers recommended hardware requirement is any Mac running Mac OS X operating system.

7.5   Recommendations

To get a high quality audio we recommend you to use a headset with a microphone rather than built-in speakers.

8.   Connecting to virtual classroom – Big Blue Button

Logging into virtual classroom (web conferencing session) may take between 2-20 seconds **depending on your Internet Connection and network traffic.** You will not be able do anything until the moderator (teacher/trainer) join the virtual classroom.

8.1   Connecting with virtual classroom

To login into virtual classroom (online lessons) click on the relevant topic named as "video conference online lesson" and accompanying   icon. Your course may have several online lessons for different dates therefore make sure to select the correct lesson.

Eg: video conference online lesson

- •   In first step a message will appear asking your permission to share camera and microphone (See Figure 8.1.1).

Figure 8.1.1

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

- Click on "Allow" to share your video and sound.

- If you click on "Deny" you will not be able to talk with other users (presenter/other users), and Other users (presenter/other users) won't be able to hear or view you on webcam.

- See Figure 8.1.2 Welcome screen of your virtual classroom (BigBlueButton- Web Conferencing Interface).

Figure 8.1.2

- Click on "Play Test Sound" to ensure you can hear audio in your headset (See Figure 8.1.3).

- Click on "Change Microphone" to adjust your microphone recording volume (See Figure 8.1.3).
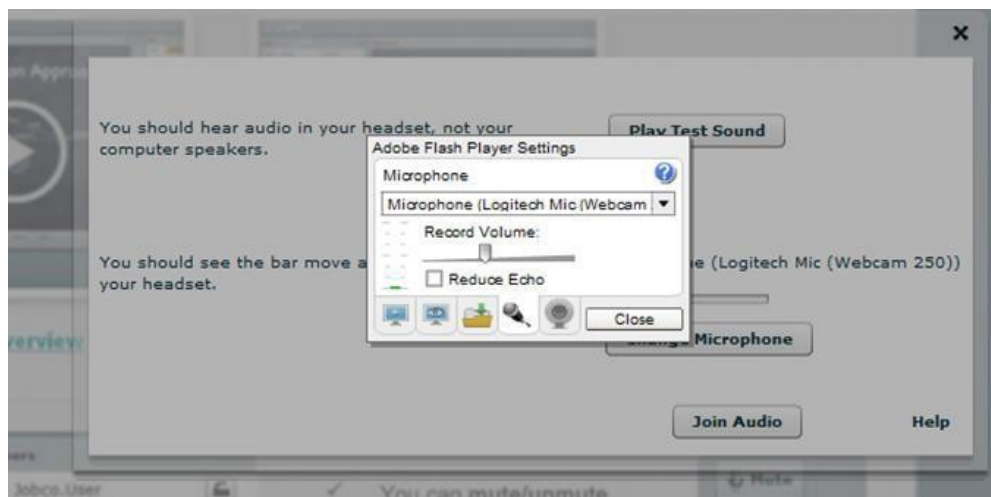
Figure 8.1.3

- Click the drop down list box to select a microphone. "Microphone" is the recommended setting for all training rooms at msie.Vclass.net site.

- Drag the volume adjustment slider to the right to increase volume and to the left to decrease volume.

- Once you setup your audio settings simply click on "Join Audio" or the close button (X) on top right hand corner of the middle screen.

- You will be logged in to the main screen of Big Blue Button.

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

8.2   Tools on main screen

- The main screen is divided into several partitions to render different functions, such as chat room, video dock, list of users, list of listeners and main presentation dock (see Figure 8.2.1)
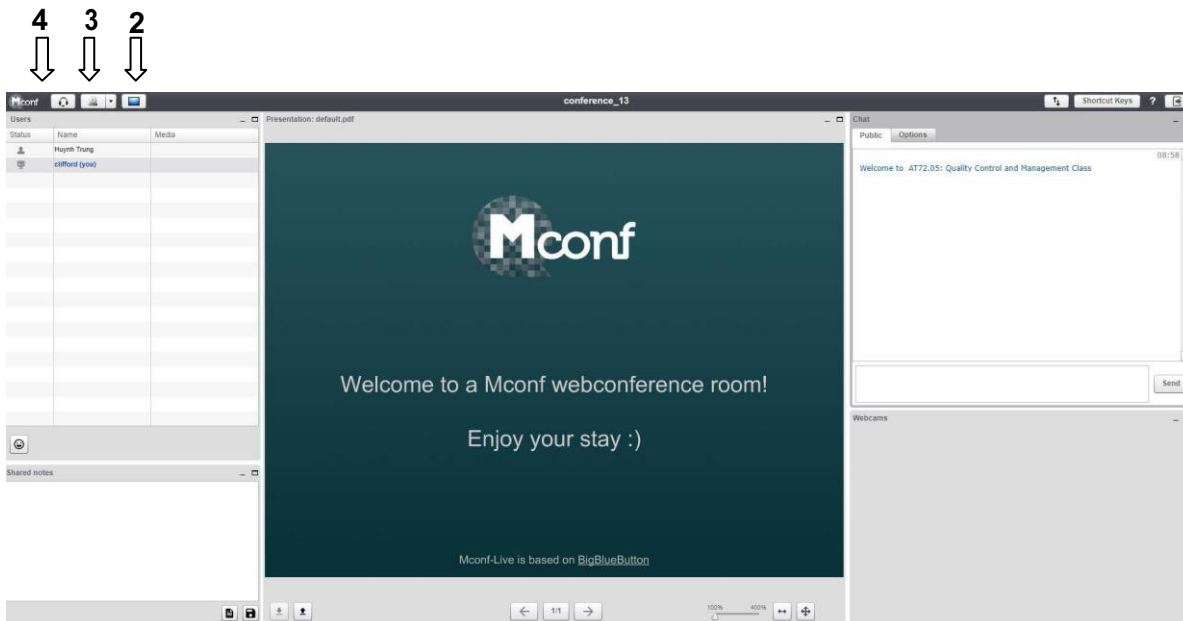
4   3   2

Figure 8.2.1

- With Desktop sharing Icon, you can share your Desktop with other users (see Figure 8.2.1).
- With webcam Icon, you can share your video by clicking the webcam icon. Once you enable sharing video, you will get a new pop up window with your video preview (see Figure 8.2.2).
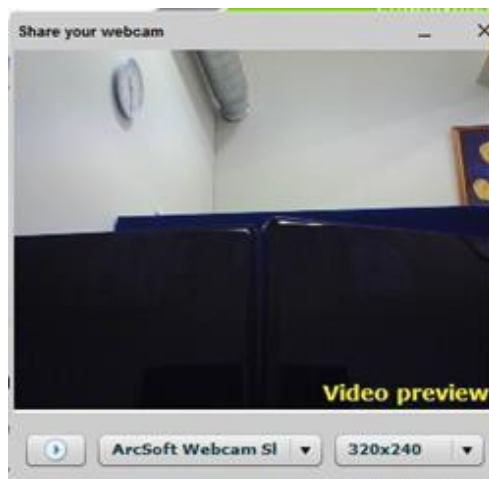

Figure 8.2.2

- Microphone icon (See Figure 8.2.1). Clicking on [icon] icon ,
  - You can exit from audio conference/Listeners window
  - Go back to audio/Microphone controls to join the audio conference

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

- This section lists all currently logged in members and reveals their status (see Figure 8.2.1).

- This section lists all listening members. You can mute yourself by clicking on the little "Mute" button [Mute] on left bottom corner of this section (see Figure 8.2.1).

- This is the chat room (instant messaging) of the web conferencing interface (see Figure 8.2.1).

- This is the video doc of your web conferencing interface. You can see shared webcams of other users (see Figure 8.2.1).

- Clicking on [hand] Raising Hand, you can let your teacher (presenter) know that you have something to share or need presenter status (see Figure 8.2.1).

- The middle section of the main screen is the presentation panel. You will get your lecture slides/ presentation on this section. If you have shared your desktop it will be visible to other users on this middle screen.

8.3   Logging out from the BBB session

The log out button is located at the Top Right Corner of the BBB session window.

Click on 'Logout' button to Logout of the current BBB session,

Then Click 'OK' on next window.

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

9. Functionality

Big Blue Button video conferencing session consists of extended whiteboard capabilities such as desktop sharing, public and private chat, pointer, zooming and drawing. You will be logging into the virtual classroom in the viewer role. Your teacher/trainer will be logging into the session in the presenter role. There is difference between these two roles in terms of capabilities. During the session, you may need to ask for presenter role or you may be given the presenter role by the trainer. Once you are in the presenter role you will be able utilize more functions.

9.1 Viewer role capabilities

This role has the limited capabilities. Note that, you will not be able to join virtual classroom until presenter has joined. The available capabilities for this role are:

- Join the video conference.
- Audio - Mute/unmute them-selves.
- Video – Share the web cam/ stop sharing.
- Public chat/group chat/ private chat.
- Access previously recorded session.
- Raise the hand (for request).

9.2 Presenter role capabilities

Presenter holds full control over web conferencing session (virtual classroom) including the ability to eject any user at any time from the virtual classroom. You will not be able to eject any user from the classroom even if you are given presentation mode during the session. The available capabilities for this role are:

- Join the video conference.
- Mute/ unmute others.
- Desktop sharing.
- Drawing, highlighting on presentation area using white board tools.
- Upload a document for presentation.
- Adjust presentation area (Fit to width, Fit to page).
- Zooming presentation area.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

9.3   Upload a presentation

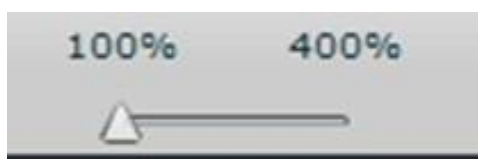These functions will become available once you switch to the presenter status.

Figure 9.3.1

1. You can upload presentation slides or any document for the presentation by clicking on

     button on bottom left corner of the presentation area (see Figure 9.3.1).

    Click button on "upload" screen to browse your files and select the file you want to upload and click "open" to get the selected file into "upload" screen. Your file name will list on "upload" screen. Click button to upload your lecture to your audience.

2. Use small green left and right arrow key to move slides forward and backward (see Figure 9.3.1).

3. Move the triangle button to left and right to zoom the presentation area. Right to increase (400% is the maximum) and left to decrease (100% is the minimum) - See Figure 9.3.1.

4. You can fit your presentation slides to width or to page by clicking these buttons (see Figure 9.3.1).

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

9.4 Whiteboard drawing tools

1. Click on "show whiteboard" button to get a drawing tool. If you want to hide the drawing tool simply click again the same button (see Figure 9.4.1).

2. You can use these tools to draw or mark on your presentation (see Figure 9.4.1).

A Highlighter to draw any shape or highlight area

To draw a rectangular in any size

To draw a circle in any size

To clear all your drawing on presentation

To undo your work

A colour palate. You can select any colour for your drawings
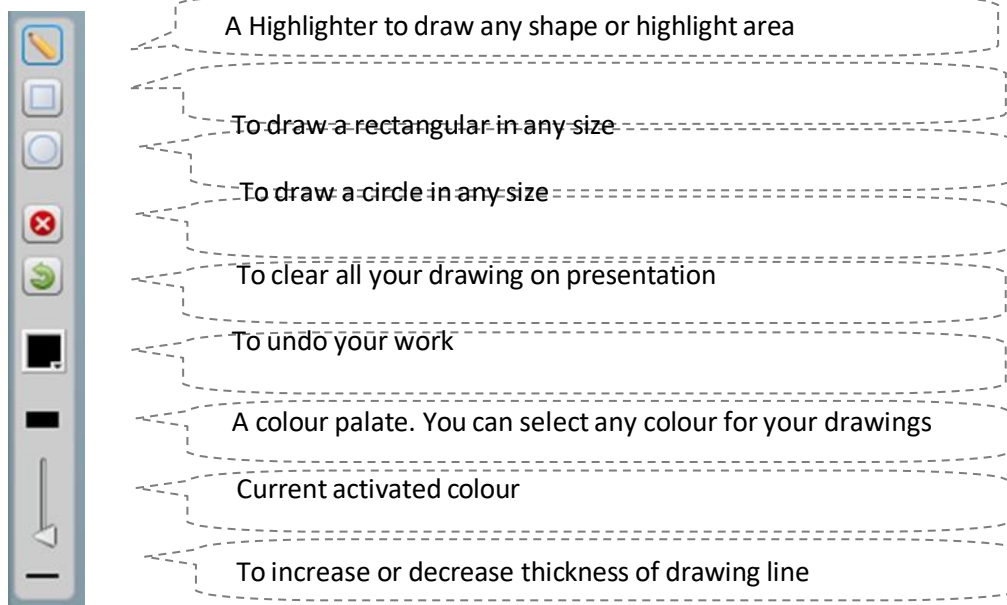
Current activated colour

To increase or decrease thickness of drawing line

Figure 9.4.1

9.5 Chat room

This is your chat room for the online classroom (see Figure 9.5.1) .

Figure 9.5.1

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0
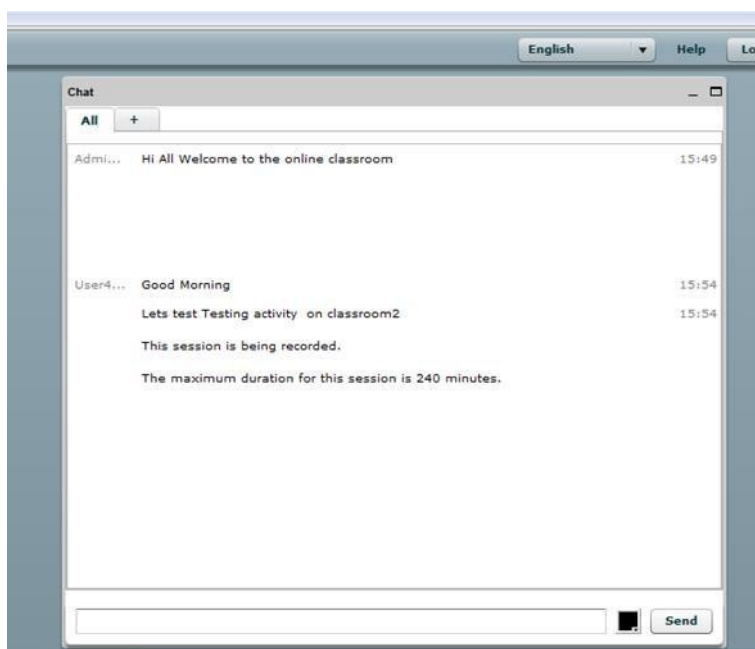
Co-funded by the Erasmus + Programme of the European Union

- If you want to chat with a particular member of the class in private for a example with teacher, click on the ✛ mark next to "All", then it shows list of all members in the online classroom. Click on a username that you want to talk to, it will bring up another tab with the user name that you click on. Click on the new tab with the username and it will open up a blank chat room. Only the selected user will be able to see the content that you put on selected tab.

Chat		
All	Test Jobco	+

- This section also list your message history for the session with time and username (see Figure 9.5.1)
- There is a place where you have to type your message (see Figure 9.5.1). Click on the text box and it will highlight with light blue border by enabling you to enter text.
- Click on colour pallet button ◼ to select a colour to your text (see Figure 9.5.1)
- Once you finish typing your message click the "Send" button (see Figure 9.5.1)

9.6   Desktop sharing

The desktop sharing facility allows you to broadcast your desktop for all members to see. Only the presenter role can share the desktop. Once you get the presenter role, you will be able to share your desktop. You will get the presenter's shared desktop on a new block therefore you can minimize or maximize the new window. However, you cannot totally close down that window. It will reside on top of the Big Blue Button window until the presenter closes the desktop sharing. Therefore, make sure to close the desktop sharing from your end once you finish your task.

You will notice that you will get three buttons (see Figure 9.6.1) on top left corner of the screen once you get the "Presenter" role where there will be only two buttons (See Figure 9.6.2) for the viewer role.
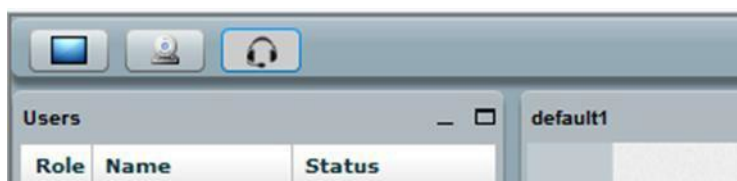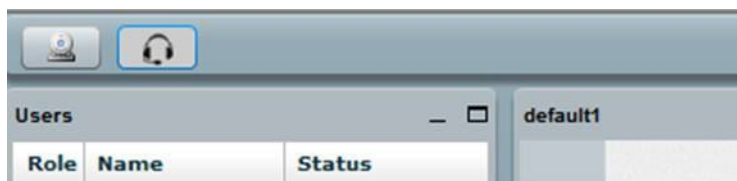
Figure 9.6.1

Figure 9.6.2

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

The procedure for desktop sharing is as follows:

- Click on the desktop sharing button [icon] on top left corner of the main screen.

- The desktop sharing screen will open in a new window within the main screen (See Figure 9.6.3)
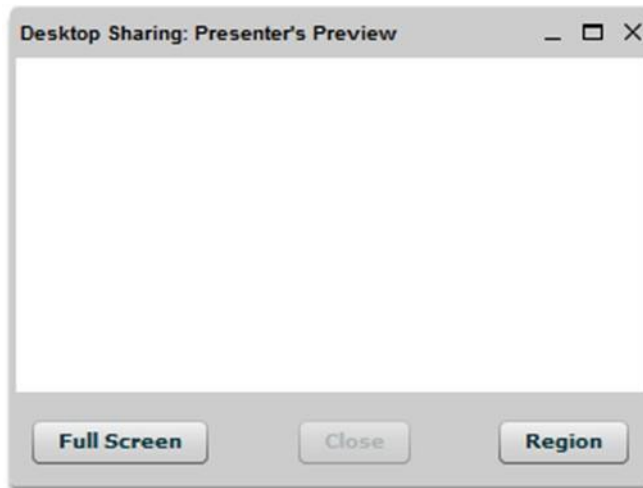

Figure 9.6.3

- You can share your entire desktop by clicking on the button "Full Screen" and it will show everything on your computer to others (all applications that you open on your computer when the time you sharing).

- You can share part of your desktop by clicking on the button "Region".

- Once you click on the button region, it will show you a frame to select area for sharing. The frame will be displayed with red dashed outline (See Figure 9.6.3). You can change the size of the frame by selection from right button corner of the frame. You can move the frame to any location by click, hold and move.

- Once you setup the size and the location of the frame click on the button "Start Sharing". Then it will show you the area that going to be share with others in a blue colored frame (see Figure 9.6.3). Once you get the blue colored frame, you cannot change the size of frame but still you can change the location going to be shared by moving the frame into desired location.

- Once you finish your presentation click on the "Close" button in middle of the "Desktop Sharing: Presenter's Preview" window or simply click on the button in top right hand corner of the "Desktop Sharing: Presenter's Preview" window to stop desktop sharing. At the same time, it will close down the "Desktop Sharing: Presenter's Preview" window.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

ANNEX II:

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry

Student Manual

for Virtual Classroom

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

CONTENT PAGE

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

**Co-funded by the
Erasmus + Programme
of the European Union**

1. Introduction

Big Blue Button is our virtual classroom or online web conferencing session. Virtual classroom sessions are to deliver a high quality learning experience to remote student. When logged into the virtual classroom, users have the option of sharing their video and audio over the web using built-in or external devices. Multiple participants and a presenter can be sharing their video and audio at the same time.

Moderator is the person who handles the conference. The moderator has complete control over all functionality within the Big Blue Button session. Moderator will be able to mute, un-mute and eject any of the participant at any time. Members can handle only their own video/audio. All members of the virtual classroom can take part in a group chat or private chat.

2. Minimum requirements

2.1   Flash player

You need to have a web browser capable of running Flash 10.3 to get access to the BBB virtual classroom.

Click on the link below and follow the steps to check the flash player version installed on your computer, to find the latest version available for your computer or to download and install flash player.

To check Adobe Flash player :   go to their website

2.2   Internet speed

Your internet connection must have the following upstream and downstream to participate successfully with virtual classroom.

Upstream: 500 Kbits/sec (0.5 Mbits/sec)

Downstream: 1000 Kbits/sec (1 Mbits/sec)

2.3   Java runtime

You will need to install java runtime to run the desktop sharing. Visit The Jave website to test the currently installed version of java. You can download update java runtime free of charge.

2.4   Hardware requirements

For Windows computers recommended hardware requirement is Dual-core CPU with at least 2G memory (RAM).

For Mac computers recommended hardware requirement is any Mac running Mac OS X operating system.

2.5   Recommendations

To get a high quality audio we recommend you to use a headset with a microphone rather than inbuilt in speakers.

3   Connecting to virtual classroom – Big Blue Button

Logging into virtual classroom (web conferencing session) may take between 2-20 seconds **depending on your Internet Connection and network traffic.** You will not be able do anything until the moderator (teacher/trainer) join the virtual classroom.

3.1   Connecting with virtual classroom

To login into virtual classroom (online lessons) click on the relevant topic named as "video conference online lesson" and accompanying   icon. Your course may have several online lessons for different dates therefore make sure to select the correct lesson.

Eg: video conference online lesson

1. In first step a message will appear asking your permission to share camera and microphone (see Figure 3.1.1).
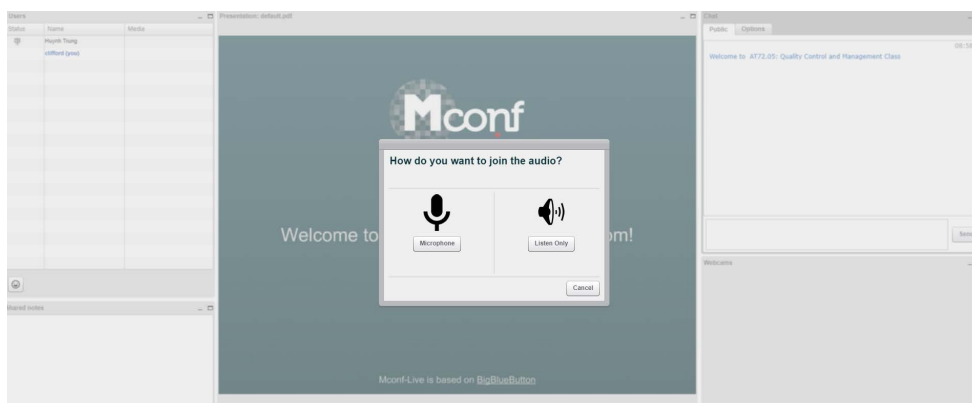

Figure 3.1.1

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

2. Click on "Allow" to share your video and sound.

3. If you click on "Deny" you will not be able to talk with other users (presenter/other users), and Other users (presenter/other users) won't be able to hear or view you on webcam.

4. See Figure 3.1.2 - Welcome screen of your virtual classroom (BigBlueButton- Web Conferencing Interface).
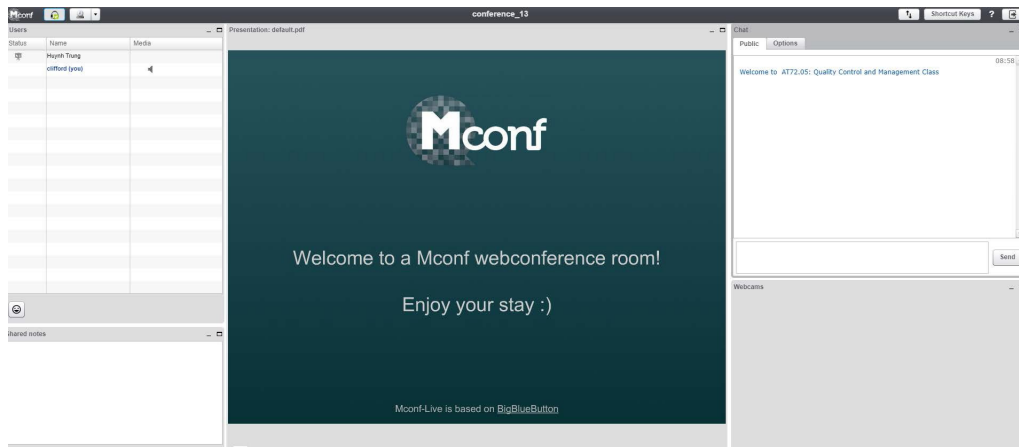

Figure 3.1.2

5. Click on "Play Test Sound" to ensure you can hear audio in your headset (see Figure 3.1.3).

6. Click on "Change Microphone" to adjust your microphone recording volume (see Figure 3.1.3).
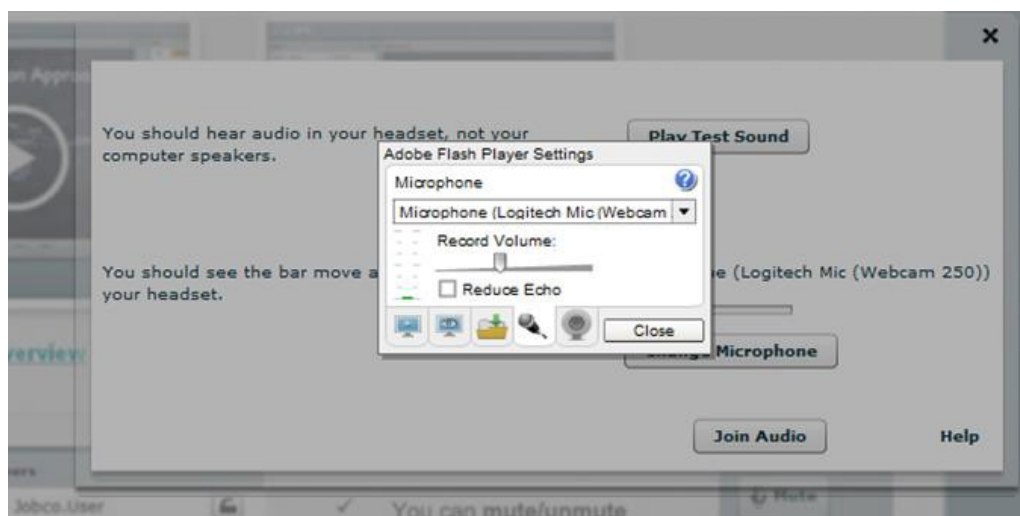

Figure 3.1.3

7. Click the drop down list box to select a microphone. "Microphone" is the recommended setting for all training rooms at msie.Vclass.net site.

8. Drag the volume adjustment slider to the right to increase volume and to the left to decrease volume.

9. Once you setup your audio settings simply click on "Join Audio" or the close button (X) on top right hand corner of the middle screen.

10. You will be logged in to the main screen of Big Blue Button.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

3.2 Tools on main screen

1. The main screen is divided into several partitions to render different functions, such as chat room, video dock, list of users, list of listeners and main presentation dock (see Figure 3.2.1)
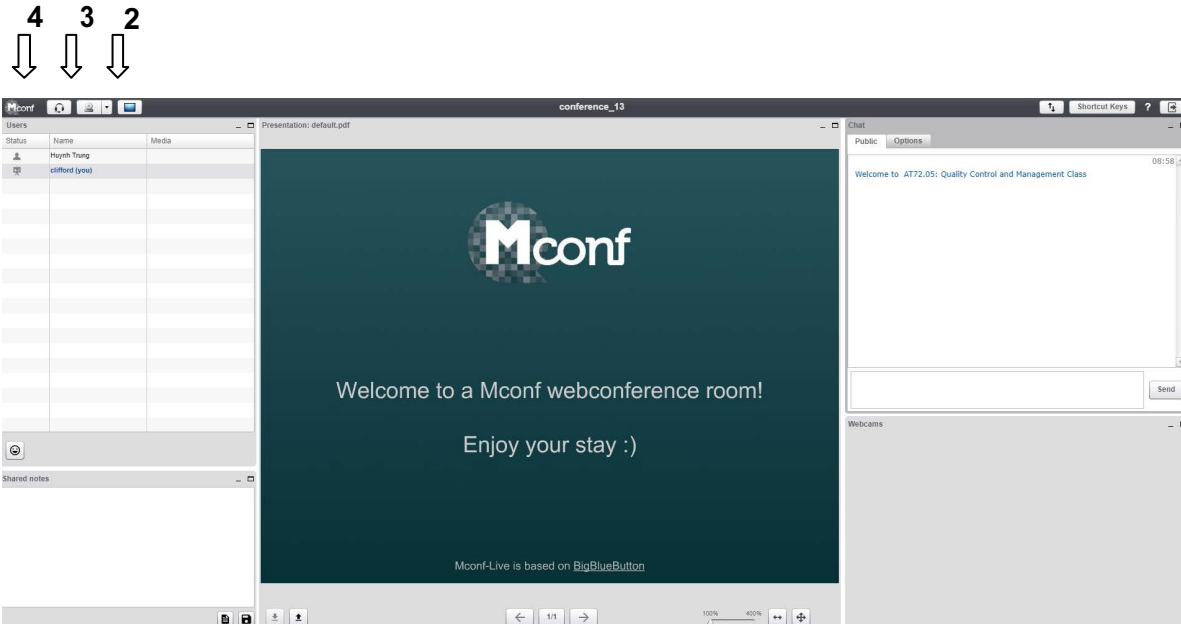
4 3 2

Figure 3.2.1

2. With Desktop sharing Icon, you can share your Desktop with other users (see Figure 3.2.1).

3. With webcam Icon, you can share your video by clicking the webcam icon. Once you enable sharing video, you will get a new pop up window with your video preview (see Figure 3.2.2).
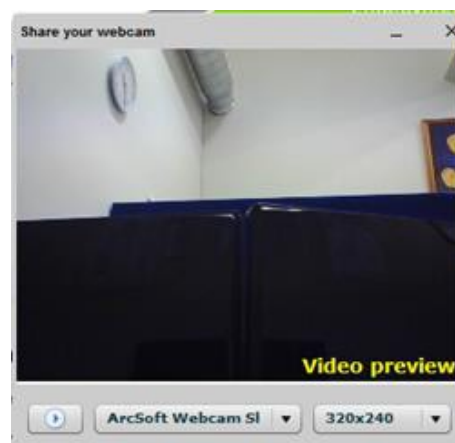

Figure 3.2.2

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

4. Microphone icon (see Figure 3.2.1). Clicking on 🎧 icon
    • You can exit from audio conference/Listeners window
    • Go back to audio/Microphone controls to join the audio conference

5. This section lists all currently logged in members and reveals their status (see Figure 3.2.1).

6. This section lists all listening members. You can mute yourself by clicking on the little "Mute" button 🎤 Mute on left bottom corner of this section (see Figure 3.2.1).

7. This is also the chat room (instant messaging) of the web conferencing interface (see Figure 3.2.1).

8. This is the video doc of your web conferencing interface. You can see shared webcams of other users (see Figure 3.2.1).

9. Clicking on ✋ Raising Hand, you can let your teacher (presenter) know that you have something to share or need presenter status (see Figure 3.2.1).

10. The middle section of the main screen is the presentation panel. You will get your lecture slides/ presentation on this section. If you have shared your desktop it will be visible to other users on this middle screen.

3.3   Logging out from the BBB session

The log out button is located at the Top Right Corner of the BBB session window.

Click on 'Logout' button to Logout of the current BBB session, Then
Click 'OK' on next window.

4. Functionality

Big Blue Button video conferencing session consists of extended whiteboard capabilities such as desktop sharing, public and private chat, pointer, zooming and drawing. You will be logging into the virtual classroom in the viewer role. Your teacher/trainer will be logging into the session in the presenter role.   There is difference between these two roles in terms of capabilities. During the session, you may need to ask for presenter role or you may be given the presenter role by the trainer. Once you are in the presenter role you will be able utilise more functions.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

4.1 Viewer role capabilities

This role has the limited capabilities. Note that, you will not be able to join virtual classroom until presenter has joined. The available capabilities for this role are:

- Join the video conference.
- Audio - Mute/unmute them-selves.
- Video – Share the web cam/ stop sharing.
- Public chat/group chat/ private chat.
- Access previously recorded session.
- Raise the hand (for request).

4.2 Presenter role capabilities

Presenter holds full control over web conferencing session (virtual classroom) including the ability to eject any user at any time from the virtual classroom. You will not be able to eject any user from the classroom even if you are given presentation mode during the session. The available capabilities for this role are:

- Join the video conference.
- Mute/ unmute others.
- Desktop sharing.
- Drawing, highlighting on presentation area using white board tools.
- Upload a document for presentation.
- Adjust presentation area (Fit to width, Fit to page).
- Zooming presentation area.

4.3 Upload a presentation

These functions will become available once you switch to the presenter status.
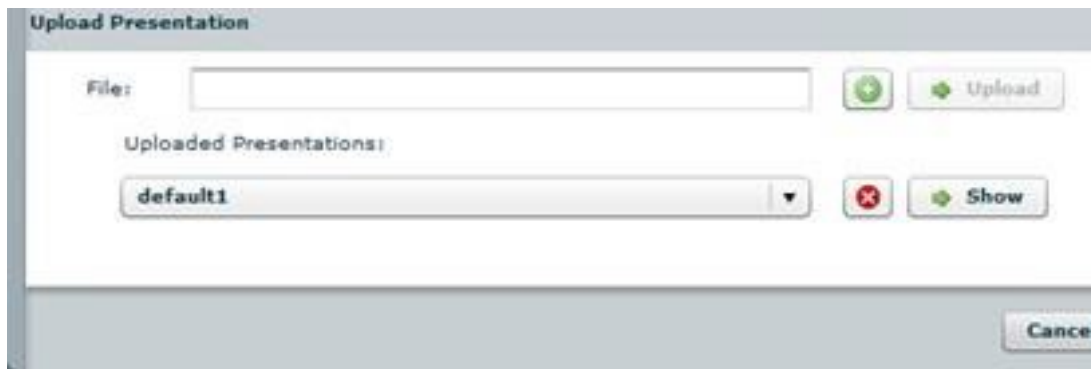

Figure 4.3.1

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

1. You can upload presentation slides or any document for the presentation by clicking on

   button on bottom left corner of the presentation area (see Figure 4.3.1).

   Click button on "upload" screen to browse your files and select the file you want to upload and click "open" to get the selected file into "upload" screen. Your file name will list on "upload" screen. Click Upload button to upload your lecture to your audience.

2. Use small green left and right arrow key to move slides forward and backward (see Figure 4.3.1).

3. Move the triangle button to left and right to zoom the presentation area. Right to increase (400% is the maximum) and left to decrease (100% is the minimum) - See Figure 4.3.1.
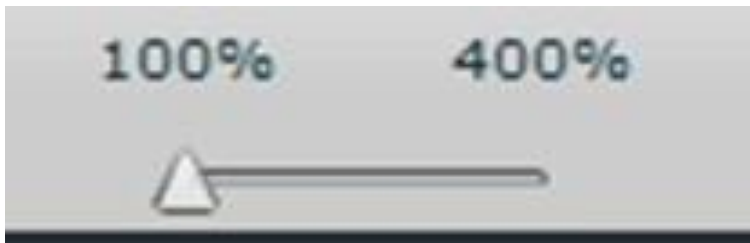
4. You can fit your presentation slides to width or to page by clicking these buttons (see Figure 4.3.1).

4.4 Whiteboard drawing tools

1. Click on "show whiteboard" button to get a drawing tool. If you want to hide the drawing tool simply click again the same button (see Figure 4.4.1).

2. You can use these tools to draw or mark on your presentation (see Figure 4.4.1).
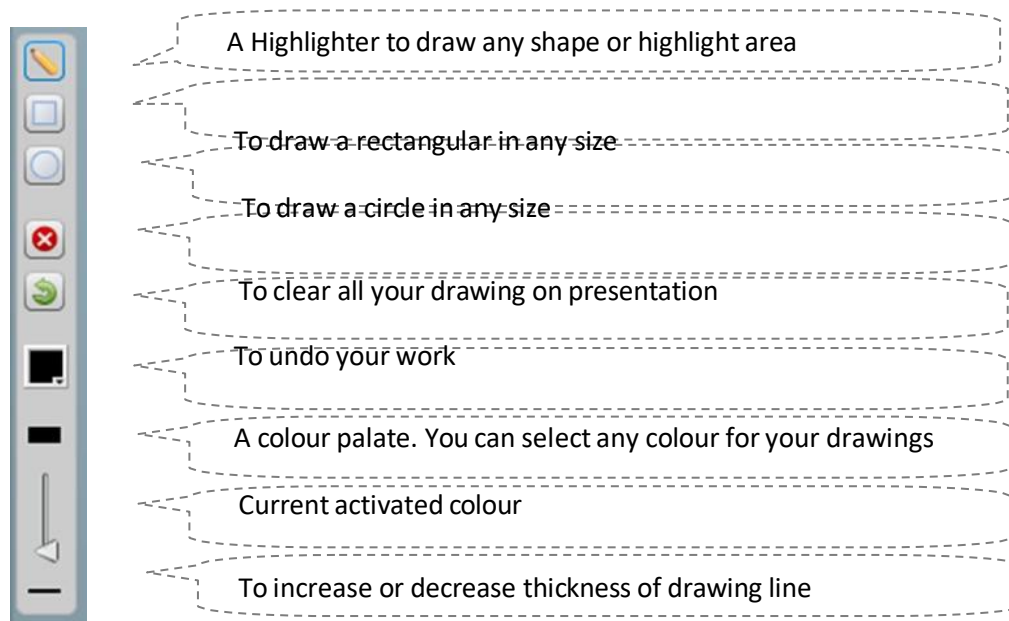
Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

A Highlighter to draw any shape or highlight area

To draw a rectangular in any size

To draw a circle in any size

To clear all your drawing on presentation

To undo your work

A colour palate. You can select any colour for your drawings

Current activated colour

To increase or decrease thickness of drawing line

Figure 4.4.1

4.5   Chat room

This is your chat room for the online classroom (see Figure 4.5.1) .

Figure 4.5.1

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union
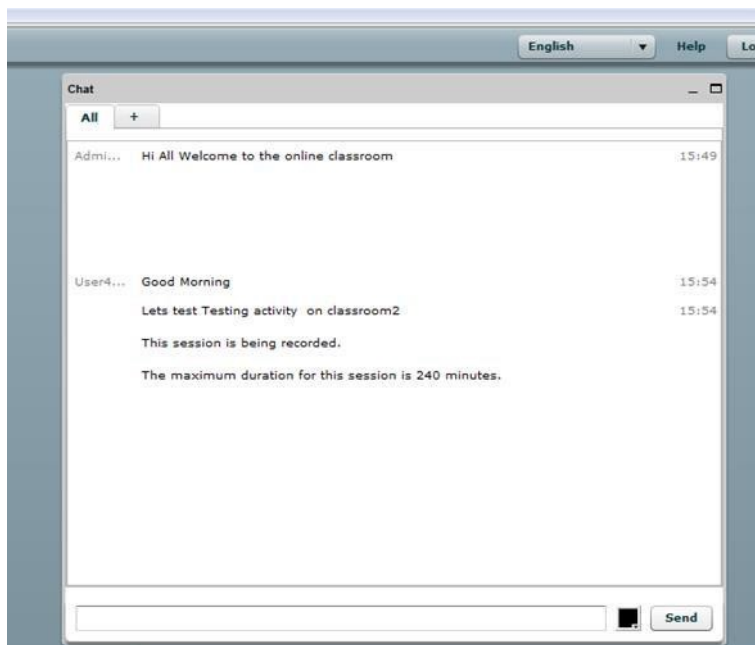
- If you want to chat with a particular member of the class in private for a example with teacher, click on the + mark next to "All", then it shows list of all members in the online classroom. Click on a username that you want to talk to, it will bring up another tab with the user name that you click on. Click on the new tab with the username and it will open up a blank chat room. Only the selected user will be able to see the content that you put on selected tab.

- This section also list your message history for the session with time and username (see Figure 4 .5.1)
- There is a place where you have to type your message (see Figure 4.5.1). Click on the text box and it will highlight with light blue border by enabling you to enter text.
- Click on colour pallet button to select a colour to your text (see Figure 4.5.1)
- Once you finish typing your message click the "Send" button (see Figure 4.5.1)

4.6   Desktop sharing

The desktop sharing facility allows you to broadcast your desktop for all members to see. Only the presenter role can share the desktop. Once you get the presenter role, you will be able to share your desktop. You will get the presenter's shared desktop on a new block therefore you can minimize or maximize the new window. However, you cannot totally close down that window. It will reside on top of the Big Blue Button window until the presenter closes the desktop sharing. Therefore, make sure to close the desktop sharing from your end once you finish your task.

You will notice that you will get three buttons (see Figure 4.6.1) on top left corner of the screen once you get the "Presenter" role where there will be only two buttons (See Figure 4.6.2) for the viewer role.
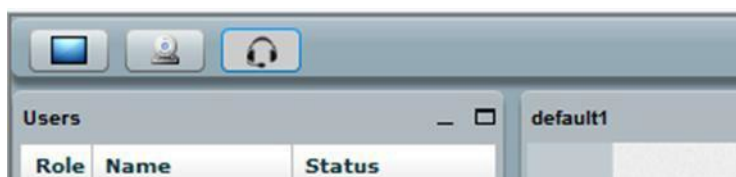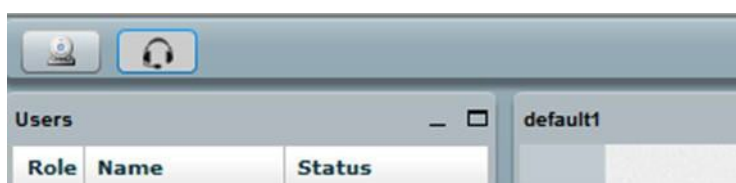

Figure 4.6.1

Figure 4.6.2

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

The procedure for desktop sharing is as follows:

- Click on the desktop sharing button [icon] on top left corner of the main screen.

- The desktop sharing screen will open in a new window within the main screen (See Figure 4 .6.3)
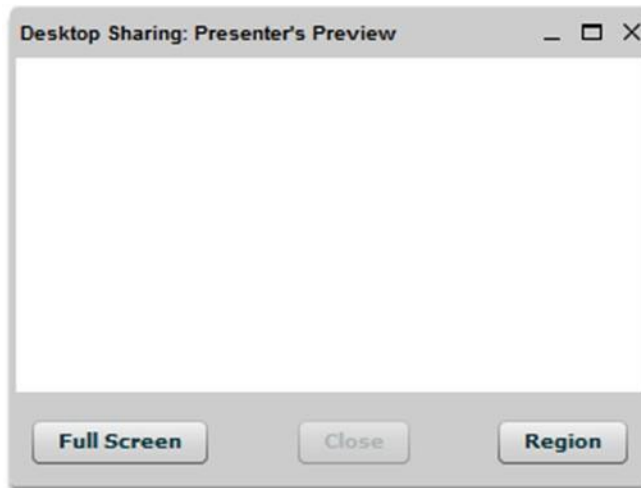

Figure 4.6.3

- You can share your entire desktop by clicking on the button "Full Screen" and it will show everything on your computer to others (all applications that you open on your computer when the time you sharing).

- You can share part of your desktop by clicking on the button "Region".

- Once you click on the button region, it will show you a frame to select area for sharing. The frame will be displayed with red dashed outline (See Figure 4.6.3). You can change the size of the frame by selection from right button corner of the frame. You can move the frame to any location by click, hold and move.

- Once you setup the size and the location of the frame click on the button "Start Sharing". Then it will show you the area that going to be share with others in a blue colored frame (see Figure 4.6.3). Once you get the blue colored frame, you cannot change the size of frame but still you can change the location going to be shared by moving the frame into desired location.

- Once you finish your presentation click on the "Close" button in middle of the "Desktop Sharing: Presenter's Preview" window or simply click on the button in top right hand corner of the "Desktop Sharing: Presenter's Preview" window to stop desktop sharing. At the same time, it will close down the "Desktop Sharing: Presenter's Preview" window.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

ANNEX III:

Questionnaire Survey on Vclass Training Session

Dear Participant,

Thank you for attending the training activities on Vclass Online Learning Platform carried out at Asian Institute of Technology on 29 November, 2019. In our effort to analyze the impact of the training, we invite you to complete the following questionnaire.

We appreciate your valuable contribution and we thank you in advance!

GENERAL INFORMATION

a) Sex (Please tick the appropriate option):   ◯ Female   ◯ Male

b) Your Age _____

c) Teaching experience (in years) _____

OVERALL FEEDBACK

a) In a scale 1 to 5, please identify for each item your level of accordance.

	1 Totally Disagree	2 Disagree	3 I am not sure	4 Agree	5 Totally Agree
a) The training was useful and relevant for the project activities.					
b) I understood the concepts presented in the training.					
c) The issues presented in the training were relevant for my teaching practice.					
d) I had an active participation during the training activities.					
e) The trainers had an effective approach during the activities developed.					
f) The training materials used were useful for the project activities.					
g) The training was valuable experience for professional growth.					
h) I will recommend this training to somebody else.					

Curriculum Development of Master's Degree Program
in Industrial Engineering for Thailand Sustainable
Smart Industry -MSIE4.0

Co-funded by the
Erasmus + Programme
of the European Union

b) In my opinion, the positive aspects of the training were:

_____

_____

c) In my opinion, the less positive aspects of the training were:

_____

_____

d) Suggestions and other comments.

_____

_____

_____

IMPACT OF THE TRAINING

In your opinion, what was the most meaningful experience carried out in the context of the training, taking into account the project activities to be developed and the challenges of your teaching practice? Please, justify your answer (including examples).

_____

_____

_____

ANY FURTHER COMMENTS

_____

_____

_____

Thank you for your cooperation.

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

ANNEX IV:

Student's Evaluation Form on V-Class

Your feedback is critical for MSIE4.0 to ensure we are meeting your educational needs. We would appreciate if you could take a few minutes to share your opinions with us so we can serve you better.

Please return this form to the course instructor. Thank you

Student's Name:_____

V-Class Course:_____ University:_____

	Strongly agree				Strongly disagree
1. V-class is user friendly (on Mobile/Ipad/Tablet/PC)	1	2	3	4	5
2. I was more successful in this course than I am in other courses taught without using this platform or similar ones.	1	2	3	4	5
3. I participated as much as I would in this course thanks to the Use of Vclass.	1	2	3	4	5
4. Announcement feature helps me to keep being informed in my enrolled course.	1	2	3	4	5
5. Discussion thread helps me in my self-paced study.	1	2	3	4	5
6. Submission of assignments was simple and easy.	1	2	3	4	5
7. Recorded video session (if used in the course) helps me to review previous session.	1	2	3	4	5
8. Convenient access to course materials for students (e.g., syllabus, outlines, notes, presentations, etc.)	1	2	3	4	5
9. Work group grading system has fairness and confidentiality	1	2	3	4	5
10. Having video conferencing can fulfill the absence of face-to-face interaction with lecturer.	1	2	3	4	5

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

ANNEX V:

Lecturer's Evaluation Form on V-Class

Your feedback is critical for MSIE4.0 to ensure we are meeting your educational needs. We would appreciate if you could take a few minutes to share your opinions with us so we can serve you better.

Please return this form to the Leader of WP3. Thank you

Instructor's Name:_____

Course:_____ University:_____

		Strongly agree				**Strongly disagree**
1.	The platform helps you to design and teach a course online effectively	1	2	3	4	5
2.	Students have adequate access to participate effectively in online courses.	1	2	3	4	5
3.	Constructing an online course is not complicated.	1	2	3	4	5
4.	Announcement feature helps my students to keep being informed about my course.	1	2	3	4	5
5.	Discussion thread helps me and my student to address questions offline.	1	2	3	4	5
6.	Uploading teaching materials is easy	1	2	3	4	5
7.	Instructor can easily monitor the access of enrolled student under his/her course.	1	2	3	4	5
8.	Convenient access to course materials for instructor and students (e.g., syllabus, outlines, notes, presentations, etc.)	1	2	3	4	5
9.	Flexibility for grading system and grade category.	1	2	3	4	5
10.	Having video conferencing can fulfill the absence of face-to-face interaction with students.	1	2	3	4	5

Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry -MSIE4.0

Co-funded by the Erasmus + Programme of the European Union

11. If you have used these online services or features of MSIE Vclass, please evaluate

		Excellent	Very Good	Good	Fair	Poor
a.	Video Conferencing	❑	❑	❑	❑	❑
b.	Peer Grading	❑	❑	❑	❑	❑
c.	Submission	❑	❑	❑	❑	❑
d.	Handouts	❑	❑	❑	❑	❑
e.	System overall	❑	❑	❑	❑	❑

12. What did your most appreciate/enjoy thinks about the Vclass? Any suggestions for improvement?

_____

_____

_____