

Engaging learners virtually with Four Channels Online Approach

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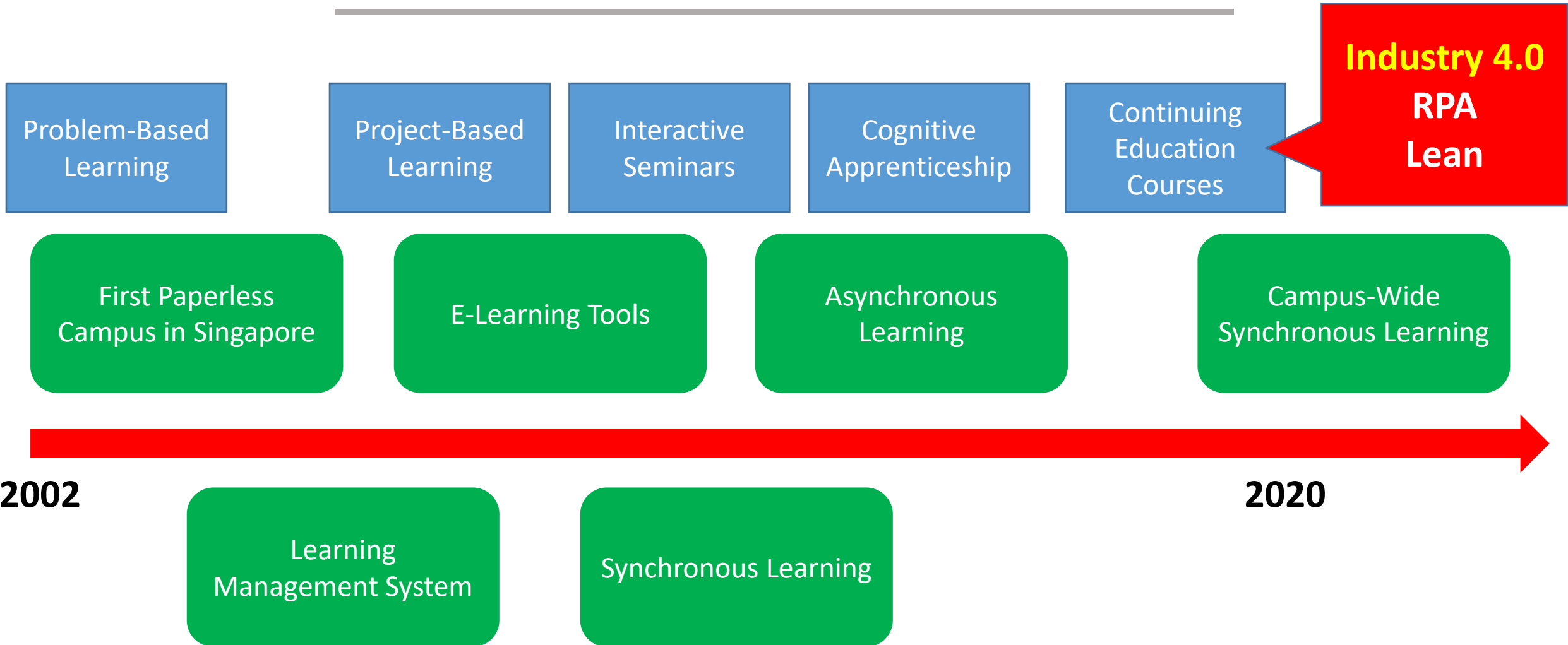
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Background

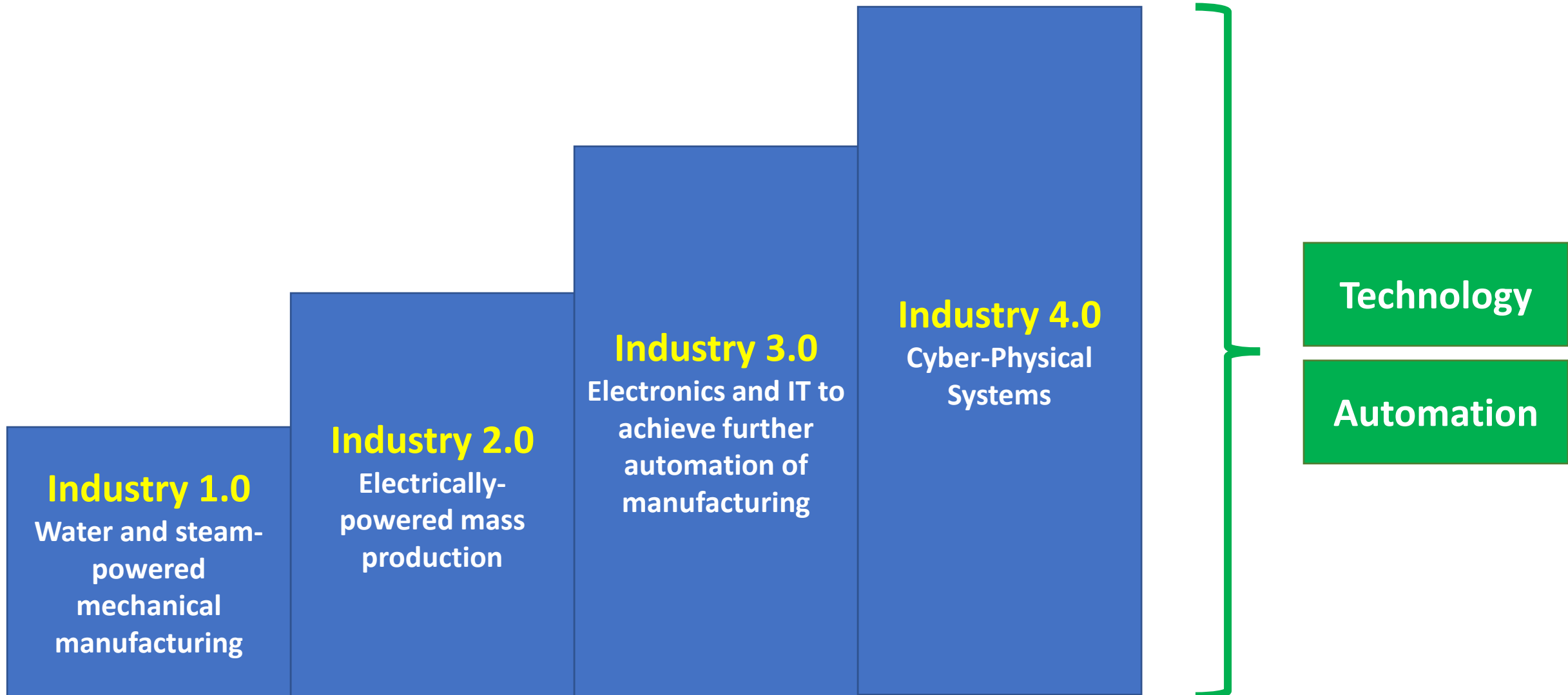


RP Developments Over The Years





What is Industry 4.0?



Industry 4.0 In Action Workshop Description



The Industry 4.0 In Action is a 2-days workshop which introduces Industry 4.0 technologies with a **strong technology hands-on focus**. There is a **mindset change** element which strive to develop digital confidence in the participants. A unique segment in the workshop is a **half-day learning journey** to the technology labs to hands-on robotics, augmented reality, internet of things and 3D printing.

Participants have feedback that they are able to bring Industry 4.0 technologies back to their personal life or workplace from the **Industry 4.0 in Apps** segment. The other topics cover in the workshop include: Introduction to Industry 4.0, Cloud and Big Data Analytics, Artificial Intelligence, Future of Work, Reflection and Sharing.



Industry 4.0 - Online Conversion

Topics	Ease of Online Conversion	Design Alternatives Considerations
Introduction to Industry 4.0	Easy	No Change
Industry 4.0 In Mobile Apps	Easy	No Change
Learning Journey – Robotics	Difficult	Record videos of robotics training
Learning Journey – IoT	Medium	Bring IoT home and live demo
Learning Journey – Augmented Reality	Difficult	Shift operations online
Learning Journey – 3D Printing	Difficult	Bring a 3D Printer home and live demo
Cloud and Big Data Analytics	Easy	No Change
Artificial Intelligence	Easy	No Change
Future of Work	Easy	No Change
Reflection and Sharing	Medium	Team Collaboration



Challenges - Online Delivery

Solutions

- Lecturers familiarity with online platform
- Students familiarity with online platform
- Students operating environment
- Learning experience of online lesson
- Absence of non-verbal cues

Pre-Class Training

Orientation

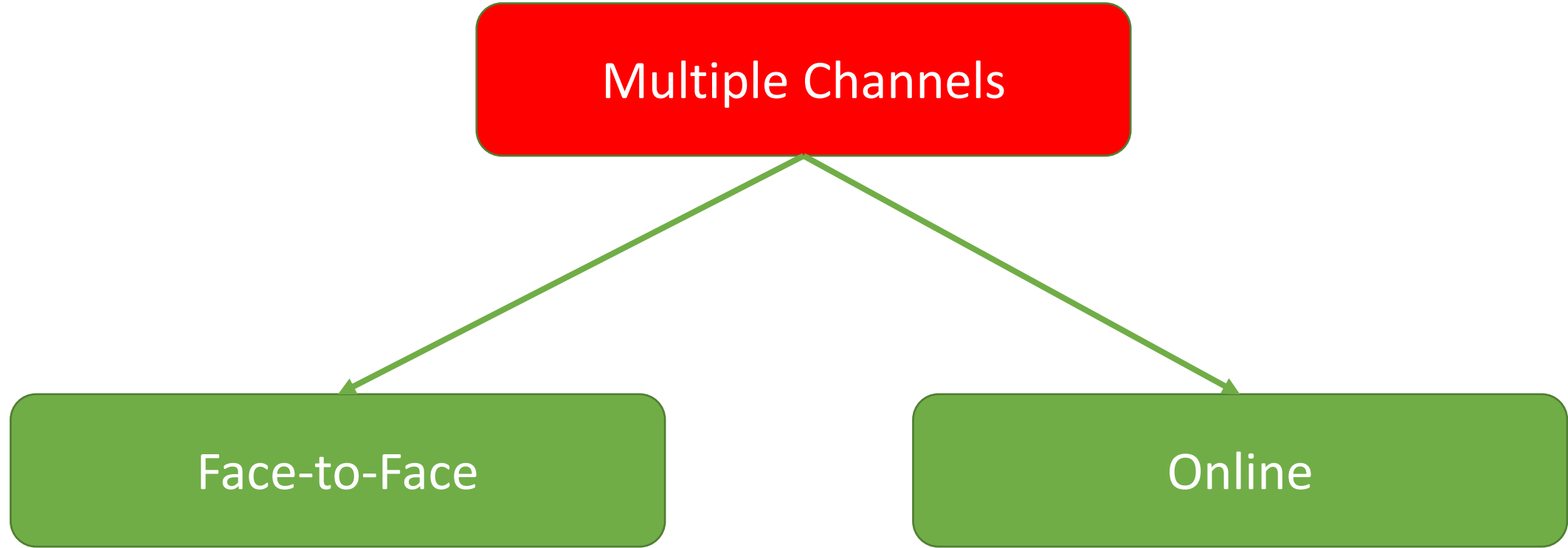
Pre-requisites

Curriculum Design

Multiple Channels



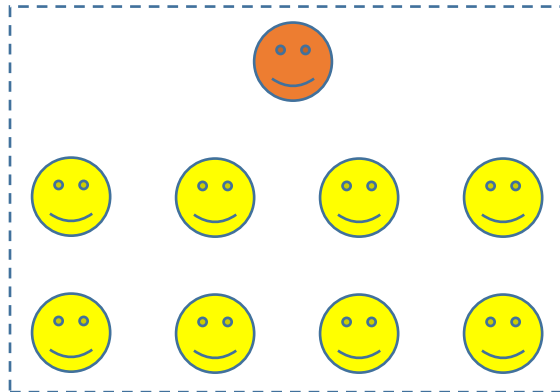
Multiple Channels



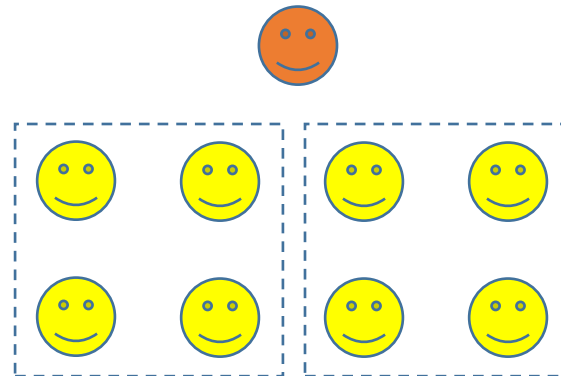


Face-to-Face Communications Channel

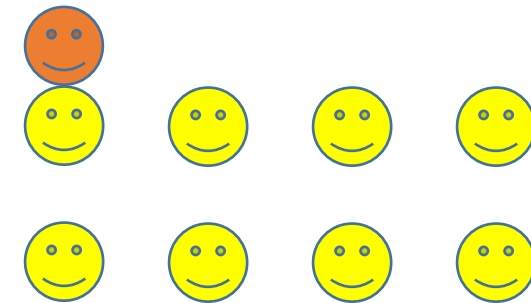
Interactive Seminars



Team Discussion



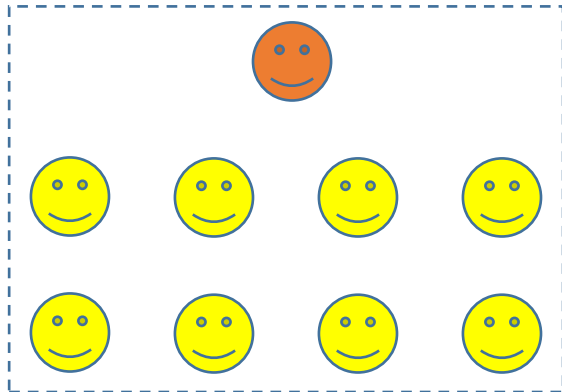
Direct Guidance



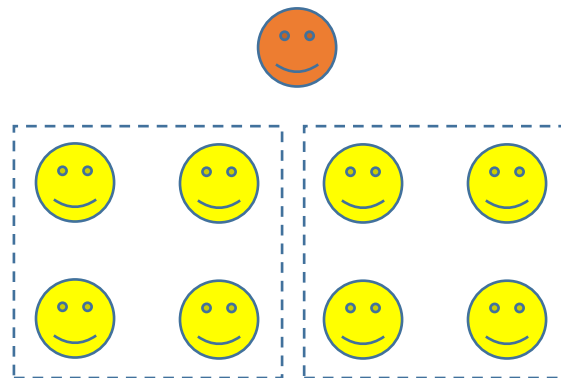


Online Communications Channel

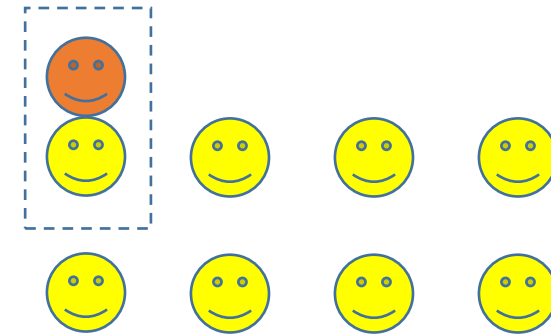
General Channel



Team Channel



Direct Channel



Feedback Channel

4 Channels Online Approach

Image of 4 Channels Online – Single Laptop

Feedback Channel

General Channel

Direct Channel

Team Channels

4 Channels can be realized on a single laptop. Multiple switching and clicking will be required to view the different channels.

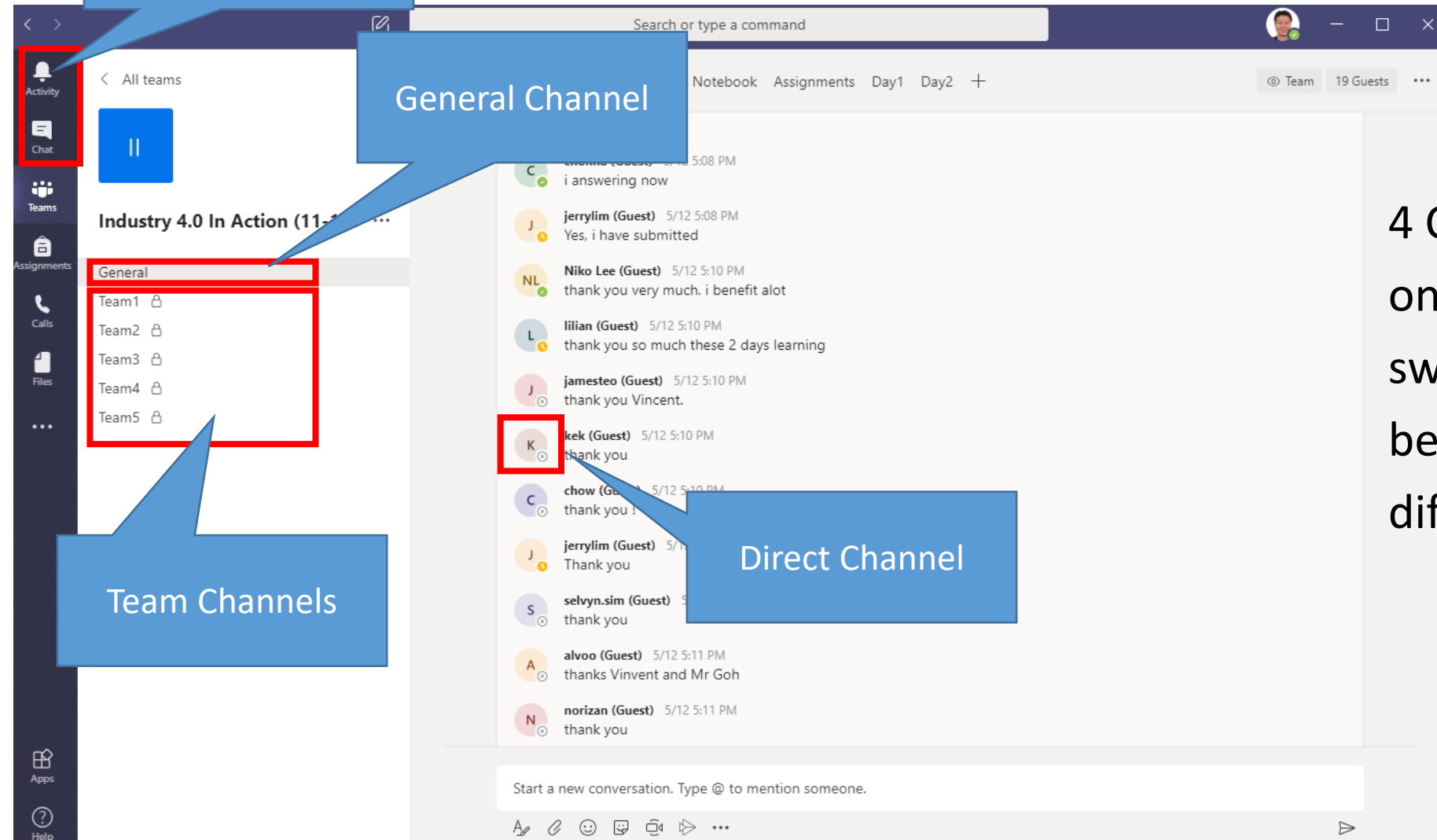
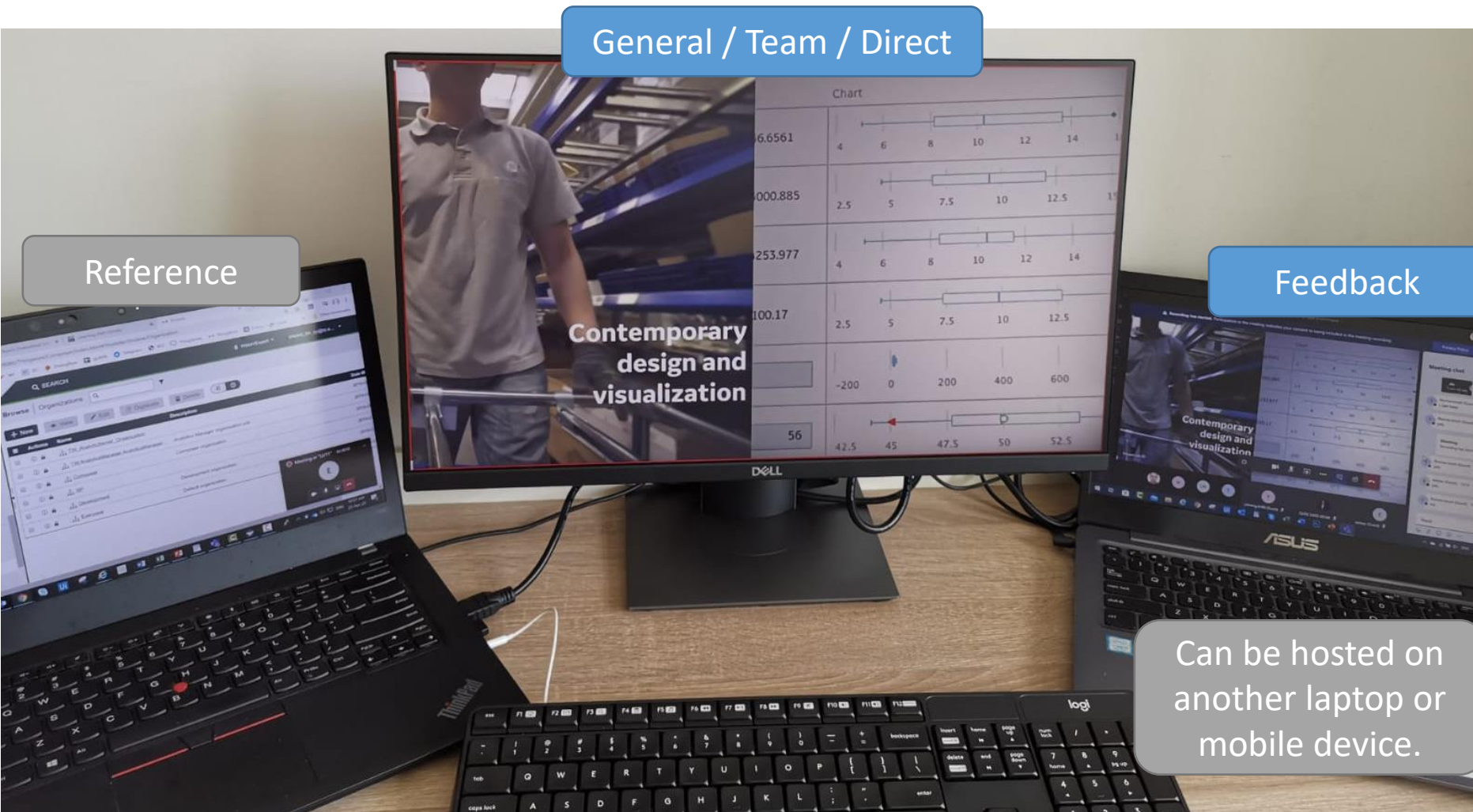


Image of 4 Channels Online – Dual Device



By using 2 devices, the General, Team and Direct can be hosted on one device for different modes of communication. While another device can be used for monitoring on screen projection and chats.



General Channel In Action

Presenting Give control Stop presenting



Industry 4.0 In Action Day 1 (Online Edition)

School of Engineering

Vincent Lim, Diana Tang

11 May 2020



Team Channel In Action

The screenshot displays a Microsoft Teams interface. At the top, there is a search bar with the text "Search or type a command". Below this, the main area is divided into a left sidebar and a central chat area. The sidebar shows a list of teams under "All teams", including "Team1", "Team2", "Team3", "Team4", and "Team5". The selected team, "Team1", is highlighted. The chat area shows a conversation in a channel named "Team1". The channel name and "4 Guests" are visible at the top right of the chat area. The conversation consists of several messages:

- alvoo (Guest) 5/12 3:56 PM: is team 1 here ?
- sctoh (Guest) 5/12 3:56 PM: yes
- grace.ong (Guest) 5/12 3:56 PM: yes
- alvoo (Guest) 5/12 3:57 PM: choonling ?
- Choon Ling Voo (Guest) 5/12 3:57 PM: yes
- Choon Ling Voo (Guest) 5/12 3:57 PM: ai ling, you lead the discussion
- alvoo (Guest) 5/12 3:57 PM: So Ms Toh and Grace
- grace.ong (Guest) 5/12 3:57 PM: better use video
- alvoo (Guest) 5/12 3:58 PM: (Message partially cut off)

At the bottom of the chat area, there is a text input field with the placeholder text "Start a new conversation. Type @ to mention someone." and a "Send" button. The Windows taskbar is visible at the bottom of the screen, showing various application icons and the system clock indicating 12:10 PM on 01-Jun-20.



Direct Channel In Action

The screenshot displays a Microsoft Teams meeting window. The main content area shows a remote desktop session of the Workfusion Studio application. The application interface includes a menu bar (File, Edit, Window, Help), a toolbar with recording and publishing options, and a central workspace with an 'Actions Flow' list and a 'Window' configuration panel on the right. The 'Actions Flow' list contains 22 steps, primarily 'Enter Keystrokes' with various keyboard shortcuts. The 'Window' panel shows settings for selecting an open window, with 'Exercise_1dayWorkfusion (2) - Excel - XLMAIN' selected. A notification in the bottom right corner states: 'yechaopeng (Guest) replied to your conversation Experience How Robotic Process...'. The meeting control bar at the bottom shows a timer at 00:24, icons for chat, microphone, and video, and a 'Request control' button. The Windows taskbar at the very bottom shows the time as 12:40 PM on 13-Apr-20.



Feedback Channel In Action

The screenshot displays a Microsoft Teams meeting interface. The main window shows a shared Excel spreadsheet titled "Exercise_1dayWorkfusion.xlsx". The spreadsheet contains a table with the following data:

1	Name	Email	Job Title	Send Email
2	Ryan	ryan@gmail.com	Lecturer	No
3	Hazel	hazel@gmail.com	Finance Manager	Yes
4	Jason	jason@yahoo.com	Marketing Manager	No
5	KTH	vincentkong@gmail.com	IT Manager	Yes

The chat window on the right, titled "Meeting chat", shows a conversation between participants:

- lim_zw (Guest) 11:47 AM: i did all the commands already
- chophebe (Guest) 11:49 AM: Hi Melvin
- chophebe (Guest) 11:49 AM: my home is on the left arrow
- chophebe (Guest) 11:50 AM: i inputted Ctrl Left
- chophebe (Guest) 11:50 AM: but it doesnt work
- lim_zw (Guest) 11:50 AM: I was struggling with that first step too. Try Ctrl Shift Left = Ctrl Home
- chophebe (Guest) 11:50 AM: i tried that too
- chophebe (Guest) 11:51 AM: doesnt seem to work as well

At the bottom of the chat window, a text input field contains the message: "Hi Su-N, I was unable to reply to the laptop. The loop function to be covered later exercise".

The bottom of the Teams interface shows a meeting control bar with a timer at 03:45:17, icons for mute, video, screen share, and chat, and a "Request control" button. The bottom-most bar shows the Windows taskbar with various application icons and the system tray displaying the time as 11:51 AM on 13-Apr-20.

Method and Results



Method

A day 1 qualitative survey and day 2 quantitative survey were undertaken for both [face-to-face and online workshops](#). The survey were conducted with 77 participants from the face-to-face class and 34 participants from the online class.

The day 1 qualitative survey were conducted at the start of the Day 2 workshop by 2 lecturers. Participants were told to share on “[One thing worth remembering from Day 1](#)”, where participants will reflect upon one key topic they will apply in their life or workplace.

The day 2 quantitative survey were conducted at the end of the Day 2 workshop online. It consists of 11 questions covering instructors and course content evaluation. Details of the questions are shown in the next slide.

Method – Instructors and Course Survey

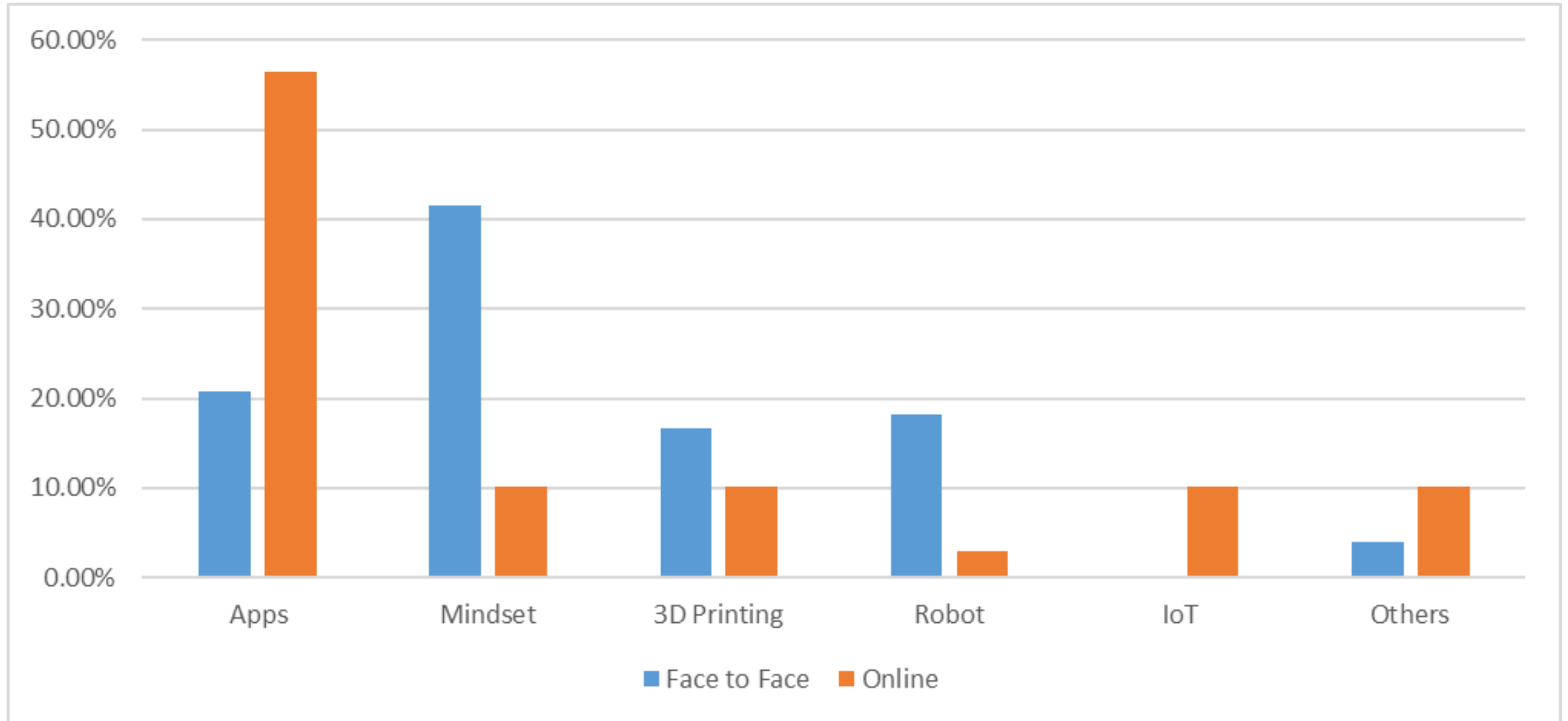


No.	Question
Q1	The training resources provided was useful for my learning (e.g. course materials, presentation slides, facilities, etc.).
Q2	The instructors demonstrated sufficient expertise in the subject area.
Q3	The instructors were able to explain concepts clearly.
Q4	The instructors delivered the lesson at a suitable pace.
Q5	The instructors were able to keep my attention throughout the course.
Q6	Overall, I am satisfied with the instructors.

No.	Question
Q7	The course met its intended objective(s).
Q8	Overall, I am satisfied with the course.
Q9	I am satisfied with the support services of the training provider/institution (e.g. efficiency in handling registration matters, responsiveness in addressing learner's queries etc.).
Q10	Given the course content, the course duration was just right.
Q11	I will recommend this course to others.

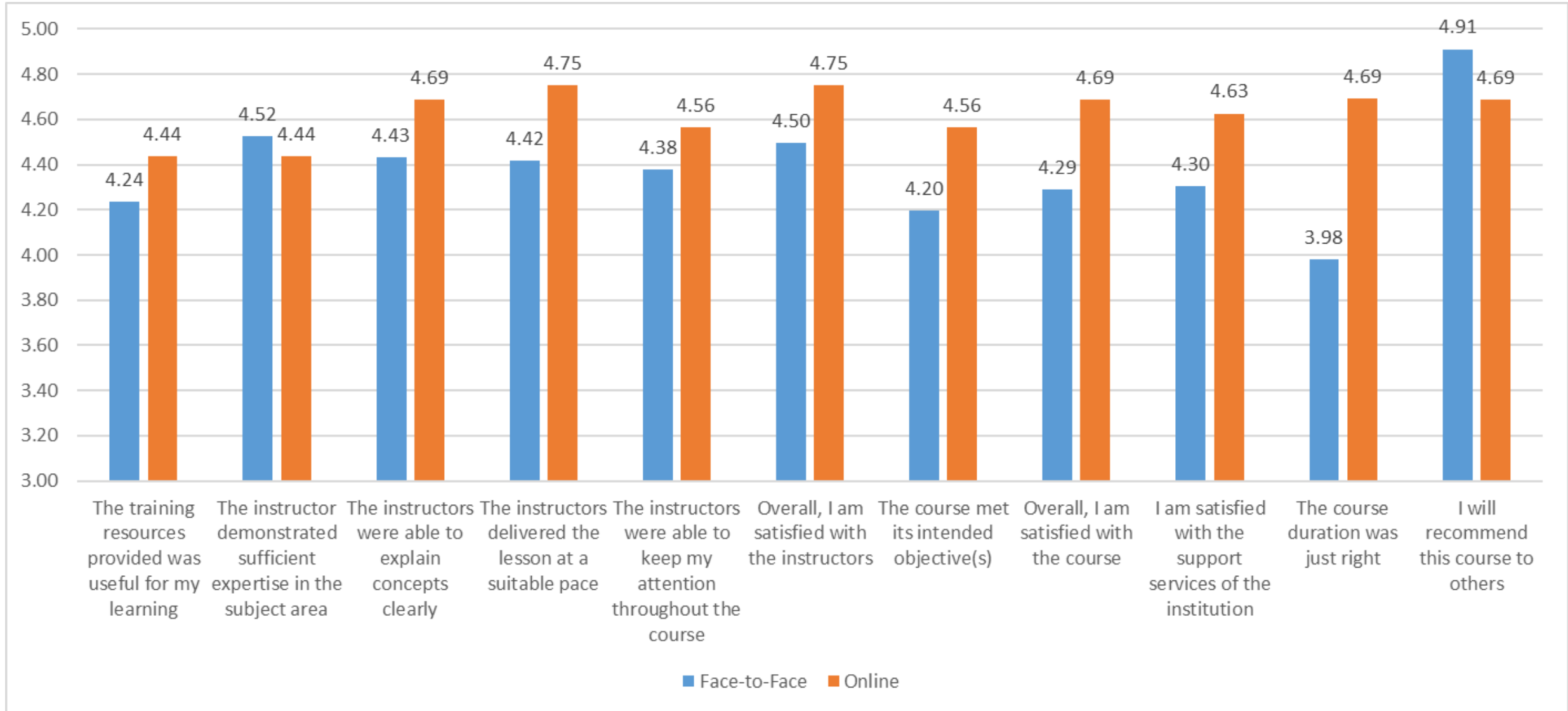


Key Topic Survey





Instructors and Course Content Survey



Results

(Key Topic Survey)



- Mindset change is difficult to be delivered via online session.
- Replacement of robotic hands-on with videos result in substantially lower learning experience on participants.
- 3D Printing, IoT and AR experiences have same learning experience as lab delivery.
- Industry 4.0 In Apps became number one for online session.

Results



(Instructors and Course Content Survey)

- Training Resources (Q1), Concepts Explanation (Q3), Delivery Pace (Q4), Attention Retention (Q5), Instructor Satisfaction (Q6), Course Objectives (Q7), Course Satisfaction (Q8), Support Services (Q9) and Course Duration (Q10) all outperformed in online delivery.
- Instructor expertise (Q2) and Course Recommendation (Q11) were higher for face-to-face delivery.

Conclusions

Key Topic Survey



Online learning is proved to be good in the following areas:

- Technology delivery where participants can directly hands-on remotely as shown from the high key topic responses for Apps.

Online learning will be difficult to achieve the same learning outcome in the following areas:

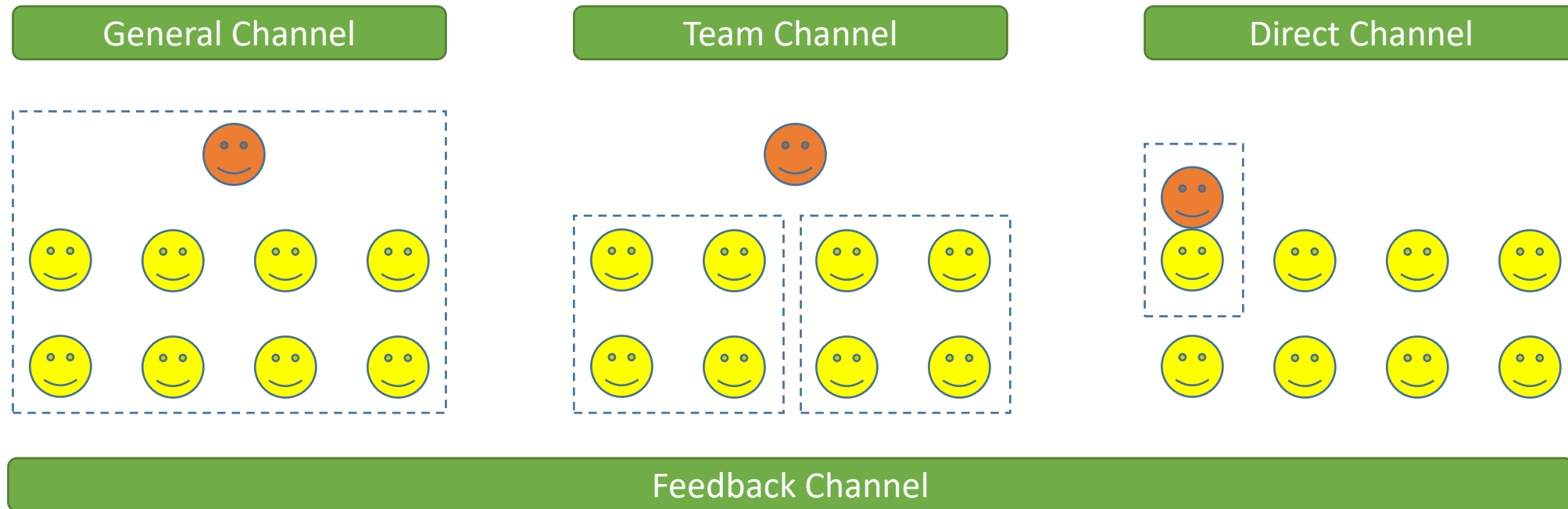
- Mindset change
- Large equipment hands-on which are not possible to be done remotely.



Conclusions

Instructors and Course Content

Utilizing the Four Channels Online Approach, instructors and course content delivery engagement is found to be higher than face-to-face in several areas.





Recommendations

Online delivery using the Four Channels Online approach can be incorporated into the two days workshop as a blended delivery approach. The below topics are recommended to be delivered online:

Topics	Ease of Online Conversion	Design Alternatives Considerations
Introduction to Industry 4.0	Easy	Online
Industry 4.0 In Mobile Apps	Easy	Online
Learning Journey – Robotics	Difficult	Face-to-Face
Learning Journey – IoT	Medium	Face-to-Face
Learning Journey – Augmented Reality	Difficult	Face-to-Face
Learning Journey – 3D Printing	Difficult	Face-to-Face
Cloud and Big Data Analytics	Easy	Online
Artificial Intelligence	Easy	Online
Future of Work	Easy	Online
Reflection and Sharing	Medium	Face-to-Face



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Thank You

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