

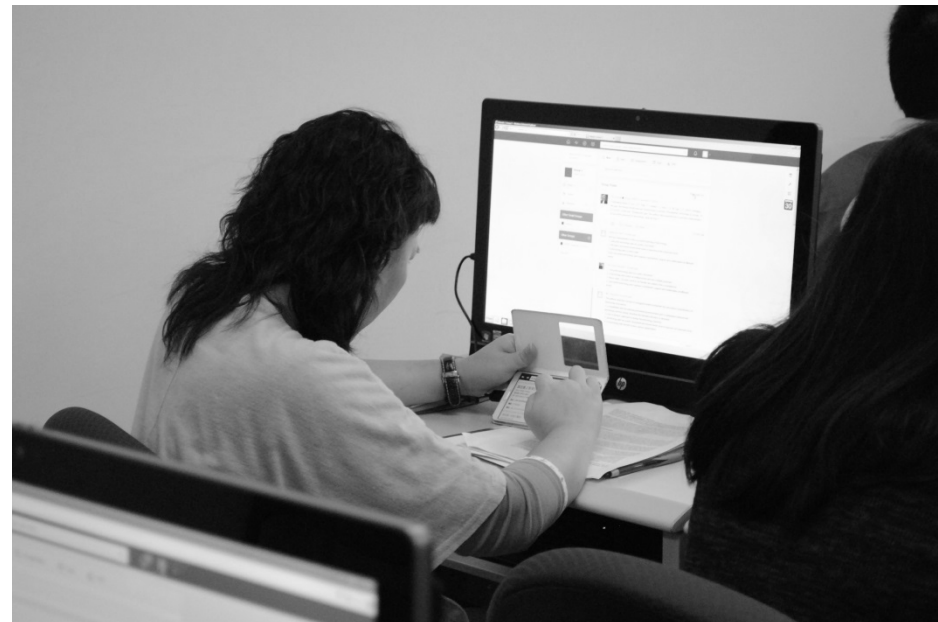
# An Experience of Using Bring Your Own Device (BYOD) as a Personalized Learning Hub for Reflective Engagement in Higher Education

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## Background of the Course

- The Professional Development Program (PDP) course is to provide theories and practices to understand issues, opportunities and challenges related to e-Learning. The BYOD design consists of 7 lessons.
- The goal is to prepare learners to come up with an e-Learning plan.
- Social Learning Platform:  
*Edmodo*  
LMS: *Moodle*
- 4 primary school teachers & 22 secondary school teachers took the course.



## Reflective Engagement

- Reflective engagement refers to learners' continual and active participation in their problem inquiry with a continuous and critical judgment of inquiry process and inquiry outcomes for possible improvement (Farr & Riordan, 2012; Lyons, 2006; Rodman, 2010).
- In the field of education, engagement refers to an action or a set of behaviors in which learners devote time, energy and resources for enhancing learning; and it is often linked to particular learning behaviors or learning outcomes (Krause, 2005; Pittaway, 2012).

## Deep Learning

- Learners experience the learning process in touch with subject topics with rich resources from multiple channels in substantial period of time (Cifuentes, Alvarez Xochihua, & Edwards, 2011; Lai, Khaddage, & Knezek, 2013).
- Learners in this case select and integrate multiple views on the targeted topics for a self-regulated consolidation of critical components or elements to genuinely understand the subject topics (Chi, 2009; Cifuentes et al., 2011).

## E-Learning

- E-Learning generally refers to the use of digital technology for learning and teaching (Stein, Shephard, & Harris, 2011).
- E-Learning concerns both the adoption of digital technology and pedagogy to enhance pedagogical practices.

## E-Pedagogy

- E-pedagogy is defined as the use of digital means to
- support learning (Al-Qahtani & Higgins, 2013; Gebre et al., 2014; Pegrum et al., 2013)
- promote communication (Pegrum et al., 2013; Thomas et al., 2013)
- facilitate assessment (Al-Qahtani & Higgins, 2013; Osborne et al., 2013) in the process of subject learning.

## **Relationship of Reflective Engagement Framework with Personalized Learning Hub and Flipped Classroom Strategy**

- BYOD as learners' "personalized learning hub" supports their seamless social interaction among peers and teachers with the convenient retrieval and sharing of e-resources in the learning process.
- The individual hub usually connects the hubs of peers and teachers through a social network platform.
- The use of portable computing devices in the BYOD initiative provides a transparent platform for individual learners to communicate with peers and teachers for just-in-time interactions, such as group discussions immediately after information search tasks, in subject learning without time and location constraints.
- The "personalized learning hub" serves as a nucleus in flipped classrooms to enhance learners' reflective engagement.

## BYOD for Flipped Classroom

**BYOD**, namely **Bring Your Own Device**, refers to a technology model which aims to foster learners to bring a personally owned device to school for the purpose of learning (Alberta Education, 2012; Thomas, O'Bannon, & Bolton, 2013).

These mobile devices provide a “**learning hub**” for learners to learn anywhere, anytime (Looi et al., 2009; Wong, 2012).

This personalized learning hub serves as a nucleus in flipped classrooms to enhance learners' reflective engagement.





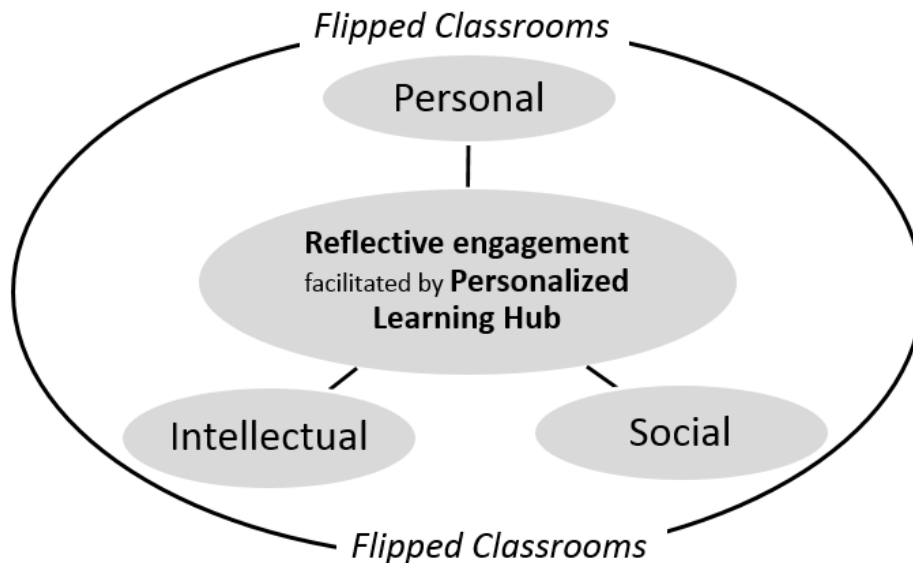
## **Adopting a Reflective Engagement Framework in Flipped Classroom Initiative:**

Reflective engagement refers to learner's continual and active participation in their problem inquiry with a continuous and critical judgment of inquiry process and inquiry outcomes for possible improvement (Farr & Riordan, 2012; Lyons, 2006; Rodman, 2010).

Two Principles:

- 1) Learners' reflection is a continual, active inquiry process across different spaces;
- 2) Reflective engagement concerns 3 non-linear dimensions.

## Adopting a Reflective Engagement Framework in Flipped Classroom Initiative:



### **Intellectual** Reflective Engagement

Learners show interests in the specific educational issues and confidence in solving the issues.

### **Personal** Reflective Engagement

Learners demonstrate awareness of learning expectations and learning outcomes.

### **Social** Reflective Engagement

Learners make active interactions with peers and teachers for knowledge construction.

# Pedagogical Design of the Seven-Lesson Flipped Classroom

## BYOD for Flipped Classroom Strategy

### After Class

Access Learning e-Resources  
Finish Reading Articles

Discuss Online with Peers  
and Lecturer

Submit Responses &  
Reflections

Preparations for e-Learning  
Plan

### Personal Learning Hub (BYOD)

Edmodo Group  
Library Database  
Course Notes on Moodle  
YouTube Videos

....

Face-to-Face  
Discussion with Lecturer  
and Peers / Small  
Quizzes

e-Learning Experiences  
in Different Subjects

Presentations

Guest Lectures

In Class

# Pedagogical Design of the Seven-Lesson Flipped Classroom

In-Class	After-Class
<b>1</b> <ul style="list-style-type: none"> <li>☑Set learning goals</li> <li>☑Setup Edmodo group</li> </ul>	<ul style="list-style-type: none"> <li>☑Submit pre-reflections on understanding of "e-Learning" to Edmodo</li> </ul>
<b>2</b> <ul style="list-style-type: none"> <li>☑Introduction to e-Learning framework</li> <li>☑Access library database <ul style="list-style-type: none"> <li>➢ Experience: e-Learning in English</li> <li>▪ [Guest Speaker] A frontline school teacher (Topic: BYOD in primary school classrooms)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>☑Reading[1]: e-Learning case study</li> <li>☑Submit expectation on the course to Edmodo</li> </ul>
<b>3</b> <ul style="list-style-type: none"> <li>☑Introduction to school-based planning</li> <li>☑Browse e-Learning case studies videos <ul style="list-style-type: none"> <li>➢ Experience: e-Learning in Chinese</li> <li>▪ [Guest Speaker] Chairman of Hong Kong Digital Game-based Learning Association (Topic: Game-based learning)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>☑Reading[2]: dissemination theory</li> <li>☑Discuss reading questions online</li> </ul>
<b>4</b> <ul style="list-style-type: none"> <li>☑Discussion: diffusion of innovations and pedagogical practices in e-Learning environment <ul style="list-style-type: none"> <li>➢ Experience: e-Learning in General Studies</li> <li>▪ [Guest Speaker] An IT in education expert (Topic: Augmented reality in education)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>☑Reading[3]: technology trend and educational use</li> <li>☑Prepare group presentation on a virtual school e-Learning plan</li> </ul>
<b>5</b> <ul style="list-style-type: none"> <li>☑Group presentation: a virtual school e-Learning plan</li> <li>☑Discussion: bridging the gap between technology and education <ul style="list-style-type: none"> <li>➢ Experience: e-Learning in Mathematics</li> <li>▪ [Guest Speaker] An IT in education expert (Topic: A LMS (Schoology) for learning and teaching)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>☑Reading[4]: historical development of e-Learning</li> <li>☑Discuss reading questions online</li> </ul>
<b>6</b> <ul style="list-style-type: none"> <li>☑e-Resources for teaching and learning in e-Learning environment <ul style="list-style-type: none"> <li>▪ [Guest Speaker] A frontline school teacher (Topic: BYOD in secondary school classrooms)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>☑Submit post-reflections on understanding of "e-Learning" to Edmodo</li> <li>☑Prepare for presentation on individual school e-Learning plan</li> </ul>
<b>7</b> <ul style="list-style-type: none"> <li>☑Individual presentation: a school-based e-Learning plan</li> </ul>	<ul style="list-style-type: none"> <li>☑Submit reflective note about their learning outcomes onto Edmodo</li> </ul>

## Data Collection and Analysis

Learners'  
Responses  
(Understanding of  
E-Learning;  
Expectation and  
Reflection)  
Submitted on  
*Edmodo*

BYOD  
Learner  
Survey

Teacher  
Focus  
Group  
Discussion

Learner  
Focus  
Group  
Discussion

PDP's  
Program  
Evaluation  
Survey

## Results in 3 Areas

### **Intellectual Reflective Engagement**

Students' understanding of "e-Learning" before & after the PDP course

### **Personal Reflective Engagement**

Students' expectation of PDP and their perceived achievement

### **Social Reflective Engagement**

Students' perceived interaction with peers, teachers & e-resources

## Results: Intellectual Reflective Engagement

Students' understanding of "e-Learning" before & after the PDP course

A framework of defining e-Learning

Dimensions	Components
Using Digital Technology for Learning	• Digital resources and digital ways of communication for learning
	• Digital ways to support collection of evidence of improvement and building awareness of progress
Learning Facilitated by E-Pedagogy	• Use digital resources and digital ways of communication for pedagogical design and practices to facilitate principles/models/theories for active, constructive and interactive ways of learning in synchronous and asynchronous manner without time and location constraints
	• Use digital ways/means such as learning analytics to facilitate pedagogical decision making in the learning and teaching process

##An assessment rubric was developed for assigning quantitative scores for the learners' pre- and post-reflections about their understanding of e-Learning.

## Results: Intellectual Reflective Engagement

Students' understanding of "e-Learning" before & after the PDP course

Examples of student reflections (Max. score = 12)

Pre-reflections	Post-reflections
<b>Example 1: From Score 3 to Score 10</b>	
"E-Learning means students learn knowledge and skills by themselves with internet media, e-books and etc."	"E-Learning is one of the approaches to drive the transformation of pedagogies and facilitate paradigm shift in teaching and learning. Teacher-centered learning gradually becomes more student-centered and learning is no longer restricted to time and location. Students can get online and use teaching materials prepared by the teacher to learn systematically. With computers, internet, e-books and other electronic media, students can learn knowledge and various skills. It can facilitate students to do self-learning and equip them with 21 <sup>st</sup> century skills."
<b>Example 2: From Score 3 to Score 7</b>	
"E-Learning includes any learning activity that involves the use of electronic devices or media."	"E-Learning is one of the trendy mode of learning with an integrative use of e-resources, e-communication and new methodology of teaching. It concerns with school stakeholders' passion, expectation and the school's culture. It also means a new form of learning supported by the right kind of tools that could happen anytime, anywhere."



## Results: Intellectual Reflective Engagement

Students' understanding of "e-Learning" before & after the PDP course

Results of learners' pre- and post-reflection about their understanding of e-Learning

Score of pre-reflections about their understanding of e-Learning (Max. score = 12)		Score of post-reflections about their understanding of e-Learning (Max. score = 12)		t-test
Mean	SD	Mean	SD	
3.000	1.095	5.577	2.043	5.626 ***

\*\*\* $p < 0.001$

The Cronbach's alpha reliability coefficient of the scoring step was 0.865.

## Results: Personal Reflective Engagement

Students' expectation of PDP and their perceived achievement

Survey results of learner personal reflective engagement (n=24)

<b>Question: I think the implementation of the BYOD initiative</b>	<b>Mean*</b>	<b>SD</b>
Empowers my control over learning	4.042	0.464
Stores my learning outcomes efficiently	3.958	0.550
Improves learning motivation in class	3.917	0.584
Facilitates understanding of the topics by getting access to course-related e-resources	3.833	0.637
Enlightens me to have effective study methods and skills	3.792	0.779
Fosters self-reflection of learning after class	3.750	0.442
Keeps track of my learning progress	3.750	0.676
Arouses my attention to the lecture	3.667	0.565

\* 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

## Results: Personal Reflective Engagement

Students' expectation of PDP and their perceived achievement

Students submitted their expectation towards the course at the beginning. In the end they submitted their reflective notes on what they had achieved.

Examples:

Score/ Degree	Example of Expectation	Example of Achievement
1/Partially Match	"To learn the possibilities and the latest development of e-Learning and see if it is appropriate to implement in my school and in the subject I teach."	"In this course I got to know about many useful digital tools and e-resources. I also got to see experiences of other schools in adopting e-Learning. What's more, this course introduced me to the future development of e-Learning and provided abundant information in this area. I could bring these materials back and help explore the possibility of implementing e-Learning in my school."
2/Match	"I expect to learn what is e-Learning and what are the appropriate resources and pedagogies. I also expect to experience what is e-Learning through practice, discussion and sharing."	"I have learnt why/how/what/when to implement e-Learning in school and the experiences as well as pedagogies to make e-Learning effective in the process of teaching and learning. In the process of coming up with our own e-Learning plan, we learnt through tutorial, discussion, sharing and exploration. Reflectively speaking I think a mix of teaching strategies might be the key to minimize learning differences among learners."

## Results: Personal Reflective Engagement

Students' expectation of PDP and their perceived achievement

Coincidence Degree of Students Expectation & Perceived Achievement

Match: 2/Partially Match: 1			
Mean	1.692	SD	0.471

(n=26)

Learners agreed that their achievements in the in-service teacher professional development programme could meet their expectations for the opportunities to

- (1) *reach appropriate resources and pedagogies* for e-Learning;
- (2) *experience e-Learning* through practice, discussion and sharing;
- (3) *deepen understanding of e-Learning* implementation in school;
- (4) *join school visits* for sharing e-Learning experience.

## Results: Social Reflective Engagement

Students' perceived interaction with peers, teachers & e-resources

Survey results of learner social reflective engagement (n=24)

<i>Question: I think the implementation of the BYOD initiative...</i>	<b>Mean*</b>	<b>SD</b>
Enhances course-related interaction with lecturers	4.000	0.600
Enhances course-related interaction with peers	3.958	0.550
Stimulates my desire of exploring course-related e-resources	3.958	0.690
Fosters collaboration in course work	3.917	0.408
Provides instant feedback from peers	3.750	0.532
Provides instant feedback from lecturers	3.750	0.608

\* 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

## Results: Social Reflective Engagement

Students' perceived interaction with peers, teachers & e-resources

Interview responses also provide evidence on learner's social reflective engagement.

	Major Feedback from Learner Focus Group Discussions
Changes in learning in the classroom	By replying to questions posted online, <i>a whole class of learners got to respond to the teacher</i> . Provided with <i>an alternative way of communication</i> , quiet learners were more engaged in sharing ideas, giving comments and participating in discussion.
	Since <i>more online resources and new tools</i> were available, learners could learn from <i>completing interactive tasks in class</i> , through researching and exploring on their own or <i>in collaboration with others</i> and they no longer relied on teacher's lecturing. Learners' motivation in learning is higher.
Changes in learning outside the classroom	With use of <i>online social networking</i> platform and learning management system, teaching and learning could be extended from inside classroom to outside of classroom and be more learner-centered. Learners could use their mobile devices to learn anywhere, anytime.
	The use of online platforms enabled learners <i>to reply to questions posted by the teacher, view responses from peers and discuss with them whenever and wherever convenient after class</i> , which provided learners with inspiring thoughts, suggestions for improvement and chances to reflect.

## Results: Social Reflective Engagement

Students' perceived interaction with peers, teachers & e-resources

Interview responses also provide evidence on learner's social reflective engagement.

	Major Feedback from Teacher Interview
Changes in teaching in the classroom	Class management was different as the teacher's responsibility was <i>to stimulate learners' thoughts, providing them with opportunities to be engaged in learning activities</i> and to explore, instead of regulating learners in class.
Changes in teaching outside the classroom	Online platforms and other ways of digital communication channels <i>enabled the teacher to connect with learners outside classroom</i> , which in a way helped the teacher to better facilitate learners who had busy schedules on their own.
	The use of social networking platform and learning management system had enabled the teacher to better monitor and document learners' progress in study as in this way assignments, quiz results, discussion and other <i>interaction records could all be recorded</i> .
	With <i>more feedback on learners' learning</i> , the teacher could evaluate the effectiveness of his teaching and refine course design and teaching materials in a timely manner. Additionally, he could again <i>respond to learners' need and further stimulate their thought with comments, feedback and etc.</i>
	Since the teacher was presented a variety of materials and new tools to be used in teaching, he needed more preparation for selecting appropriate resources and tools, as well as re-designing his course.
	As learners were using their own devices, in addition to preparing for teaching, the teacher also need to handle technical problems and prepare backup plans for learners when their devices did not work well.

## Overall Impact of the BYOD Initiative on Reflective Engagement

Learners' responses collected from the course evaluation survey

Responses from Learners	Count	Intellectual	Personal	Social
The programme could enhance my understanding of e-Learning (e.g. basic rationale, central focus, development trends, etc.).	4	✓	✓	
The programme could stimulate my reflection on e-Learning (e.g. holistic definition, implementation ways, future expectations, etc.).	3	✓	✓	
The programme could change my mindset and steps for e-Learning implementation.	1		✓	
The course lecturer and course materials helped me to better understand e-Learning (e.g. theoretical background, pedagogical demonstrations, latest development, etc.).	4	✓		✓
The practical implementation examples and interactive lesson tasks helped me to better implement e-Learning (e.g. useful tools, pedagogical practices, etc.).	2			✓
The experience sharing from guest speakers and other classmates helped me to think deeper about e-Learning.	4			✓
<b>Total</b>	18	11	8	10



## Conclusion and Implications

This study is to investigate the impact of the Bring Your Own Device (BYOD) as a “personalized learning hub” initiative on learners’ reflective engagement at a higher education institute.

The BYOD initiative is found to be able to support learners to attain intellectual, personal and social reflective engagement.

There are ***three implications from this study.***



## Conclusion and Implications

Firstly, the results imply that the use of a reflective engagement framework and the deployment of **BYOD as a “personalized learning hub”** initiative in the higher education sector ***can engage learners in learning interactions for knowledge construction with self-reflection on their learning process and learning outcomes, and therefore to achieve deep learning.***

BYOD will be

- (a) a “hub” for *social interactions* with peers and teachers anytime, anywhere;
- (b) a “hub” for *storing and accessing online and offline resources* through mobile and cloud computing for personal and social engagement;
- (c) a “hub” for *making chunks of time* such as on public transport, at home, waiting time, etc. *for varied learning purposes* such as reflective engagement learning activities.

## Conclusion and Implications

Secondly, this study found that the ***reflective framework was able to guide the teacher to design learning tasks*** that made learners aware of

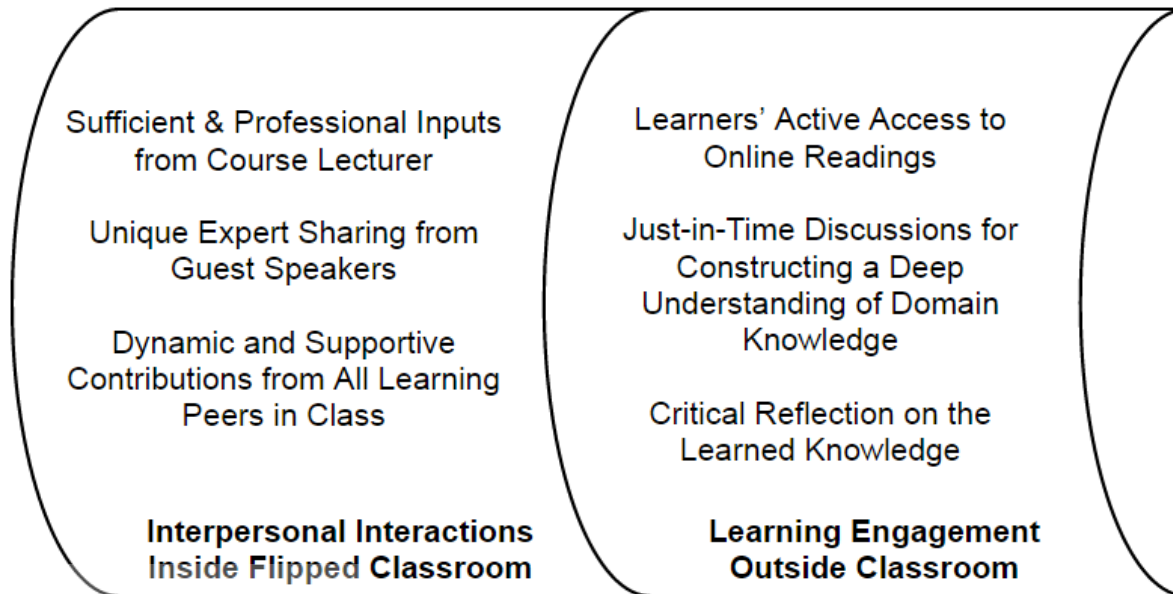
- 1) the domain-specific intellectual ideas important for the targeted topics,
- 2) the link between their personal learning intentions and expectations,
- 3) the support from social interactions with peers in the learning process.

It reveals the need of *a framework to guide pedagogical designs for reflective engagement*. Learners seldom make reflective engagement automatically during the learning process.

*Personal learning hub is a means for achieving the goal of reflective engagement* in the learning process which has to be guided by a framework.

## Conclusion and Implications

Thirdly, this study had a **successful experience** in the effective integration of flipped classrooms strategy with the BYOD as a “personalized learning hub” initiative. It is **attributed to the interlocking relationship between the vigorous interpersonal interactions inside the classrooms which triggered and extended the learning activities outside classroom.**



It also reveals the importance of opportunities for learners to have social interactions and personal reflections to achieve active, constructive and interactive learning inside and outside classroom with the support of the “personal learning hub”.

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# Thank You.

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