

HOW DO COMMUNITIES OF PRACTICE FACILITATE EDUCATIONAL TECHNOLOGY ADOPTION IN HIGHER EDUCATION? A CASE STUDY IN HONG KONG

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Introduction

- Learning management system (LMS) refers to computer based database and presentation systems that automates the administration, tracking, and reporting of training events.(Szabo, 2002; Ellis, 2009).
- **Moodle** is a LMS released on 20 August 2002. It is an open-source software written in PHP.
- Students and teachers are benefited from Moodle in terms of course delivery, personalized learning and learning analytics. (Lu & Law, 2012; Lau González., Jáuregui Haza, Pérez Gramagtes, Fariñas León, & Le Bolay, 2014; Caputi & Garrido, 2015).

Introduction (cont.)

- There was university spending 10 years and more in **Moodle adoption** which was far from their original expectation (Cerioli, Ribaudo & Rui, 2012).
- **Technology adoption** is a complicated process involving strategy, structure and support in the institutions (Porter, Graham, Spring & Welch, 2014).
- The introduction of technologies is only the beginning of the innovation. The successiveness of the innovation depends largely on the systemic change coming after the introduction (Law, Yuen, & Fox, 2011).

Introduction (cont.)

- Under the definition from Wenger (1998), **community of practice (CoP)** means **groups of people** who share a **concern**, a set of **problems**, or a **passion** about a **topic**, and who deepen their knowledge and expertise by interacting on an ongoing basis.
- **CoP** could be a possible solution for **Moodle adoption** in higher education institutes. But complex structure is usually found in higher education institutes.
- **CoP** formed under this context will inevitably include different participants related to Moodle use and result a **heterophilous CoP**.

Problem

Surprisingly, **heterophilous CoP** are seldom reported in previous studies. Most of the **CoP** in higher education institutes were built with compulsory enrolment, e.g. only allowing teachers to join. There was limited freedom in the social formation of CoP. (Dubé, Bourhis, Jacob, & Koohang, 2006).

It should be aware that the suitability of applying CoP for systemic change in educational technologies adoption might be lost if compulsory enrolment is adopted. Relevant stakeholders and also their practices could be filtered during building such CoP.

Objective

In this study, a case about building a **CoP** about **Moodle** practice at the University of Hong Kong (HKU) was observed. It is **assumed** that a **heterophilous CoP** would emerge if voluntary participation is adopted. All members at the university could join the community voluntarily.

The **heterophilous CoP** about Moodle practice at the university could bring an overlooked concern about the existence of **heterophily** in this kind of **CoP**. It opens up an opportunity to understand both setting and mechanism about **CoP** designed for **educational technologies adoption** in **higher education**.

Framework (Heterophily)

Rogers and Bhowmik (1970) proposed the homophily-heterophily as a **relational concept**. He argued that communication research should not only focus on individuals, but also the relation between the sources and receivers.

Heterophily is the degree to which pairs of individuals who interact are different with respect to certain attributes. There are two levels of this concept, subjective and objective, based on the measurement.

Optimal heterophily (Thomas, 1974) implies gravitating towards a range of difference on **determinant attributes** along the homophily-heterophily continuum which leads higher levels of communicating effectiveness.

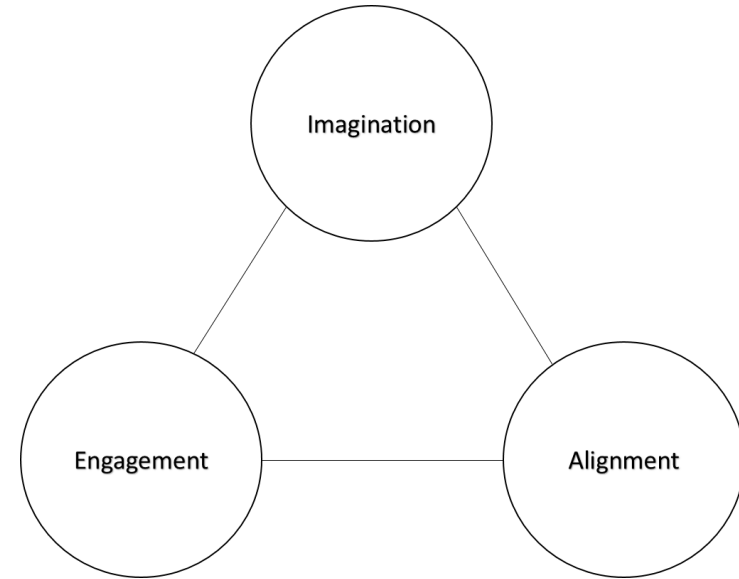
Framework (Modes of belonging)

Wenger (1998) proposed the modes of belonging to resolve the complexity between competence and experience in CoP through analysing individuals about their different forms of participation.

Engagement is described as “active involvement in mutual processes of negotiation of meaning”. It includes unfolding shared histories of learning, creating relationship or interacting in group activities.

Imagination is described as “creating images of the world and seeing connections through time and space by extrapolating from our own experience“. It includes images of possibilities, images of the world, images of the past and the future and images of ourselves.

Alignment is described as “coordinating our energy and activities in order to fit within broader structures and contribute to broader enterprises“. It includes coordination of our work, competence, interest and even belief.



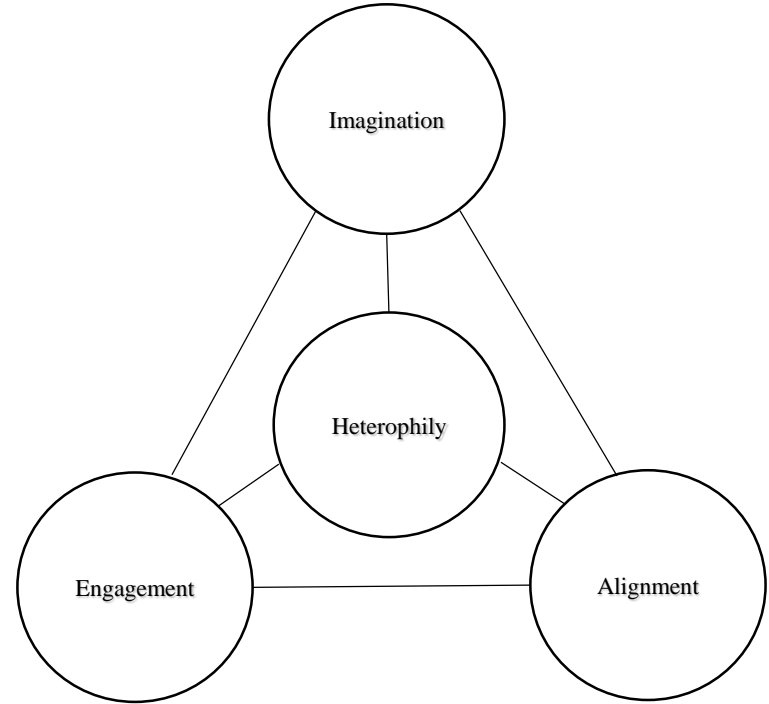
Modes of belonging framework by
Wenger (1998)

Research Questions

RQ1. What heterophily could be found in the CoP for Moodle adoption at a university?

RQ2. How does social learning happen in this CoP?

RQ3. Is there any difference in social learning between participants with different experiences in this CoP?



The working framework adopted
from Wenger, 1998, P.174

Methodology (Case Selection)

Case study approach (Single instrumental case)

“A case study is an empirical inquiry that investigates a contemporary phenomenon in-depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2009, p. 18).

Case study is not a methodological choice but a choice of what is to be studied” (Stake, 2005, p.443-466).

The Community of Good Practice in Using Moodle@HKU - 7 months observation - academic year 2016/2017

- 8 teachers were recruited for 8 case sharing sessions (snowball sampling)
- Other participants were recruited by mass emails and posters (convenience sampling)
- Limited context: HKU + complex structure (different units related to Moodle practice)
- Desirable bounded system for investigating the characteristics of heterophilous CoP and its influence on different participants

Methodology (Data Collection)

Multiple Data Source

- Personal interview, field observation, survey

*** Data from different sources could improve the quality and credibility of the results through triangulation. The number of participants in CoP is usually insufficient for advanced statistical analysis, e.g. SEM, to explore causal relationships between different constructs. Data from different sources could help developing these relationships.

- First sharing session for familiarization with the rundown and social interactions in the CoP
- Only acted as an observant to collect questionnaire and record field observation in other sessions

This arrangement kept minimal control over events from the researcher. The case was developed under the real-life context. It is helpful to preserve the value of a case study and provides empirical information to readers (Hitchcock and Hughes ,1995).

Methodology (Instruments)

Questionnaire

- Background data
- Participants' perception of diversity in the CoP as a measurement of subjective heterophily
- Modes of belonging as a measurement of participation in the CoP

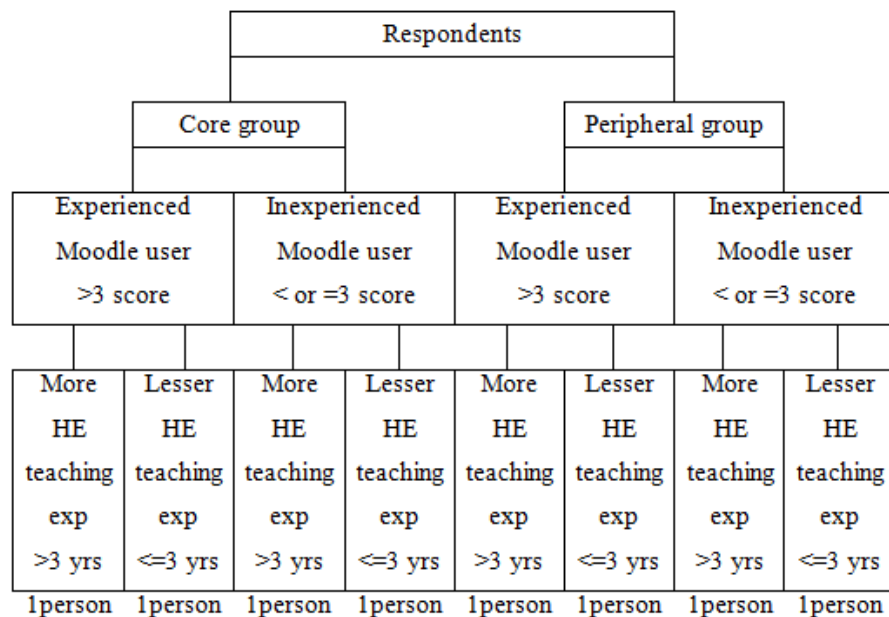
Field Observation

- Participants' performance (attempting to raise questions or giving responses)
- Classifying participants into active group and peripheral group

Interview

- Purposive sampling to represent a wide range of backgrounds
- Experiences of participating in the CoP
- Influence of heterophily on modes of belonging

Methodology (Interview Selection)



* Moodle using experience was a self-reported measurement of 1-5 Likert scale

1=Strongly Disagree, 2= Disagree, 3=Neither, 4=Agree, 5= Strongly Agree

** Higher education teaching experience was a self-reported measurement with open answer

Methodology (Interview Selection)

Interview sample summary

Interviewee code	HE teaching experience	Moodle experience	Level of participation	Faculty
A00	3 yr(s)	Disagree	Core	Non-faculty units
A10	16 yr(s)	Disagree	Core	Non-faculty units
A01	3 yr(s)	Agree	Core	Medicine
A11	15 yr(s)	Agree	Core	Engineering
P00	0 yr(s)	Strongly Disagree	Peripheral	Education
P01	0.5 yr(s)	Agree	Peripheral	Education
P11	5 yr(s)	Strongly Agree	Peripheral	Non-faculty units

Results

7 sharing sessions

Totally 97 participants

70 of them have completed the consent and accepted to participate in this study (72.16%)

56 out of 70 questionnaires were completed and valid.

Frequency of participation in sharing sessions

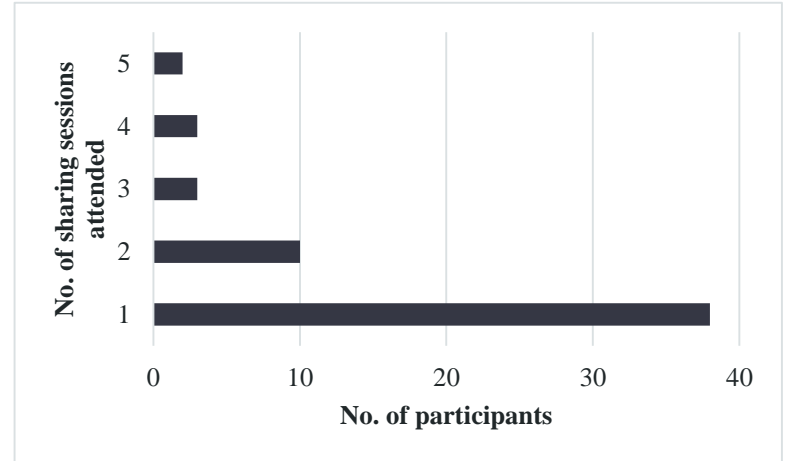
38 of them participated in only 1 sharing session

10 of them participated in 2 sharing sessions

3 of them participated in 3 sharing sessions

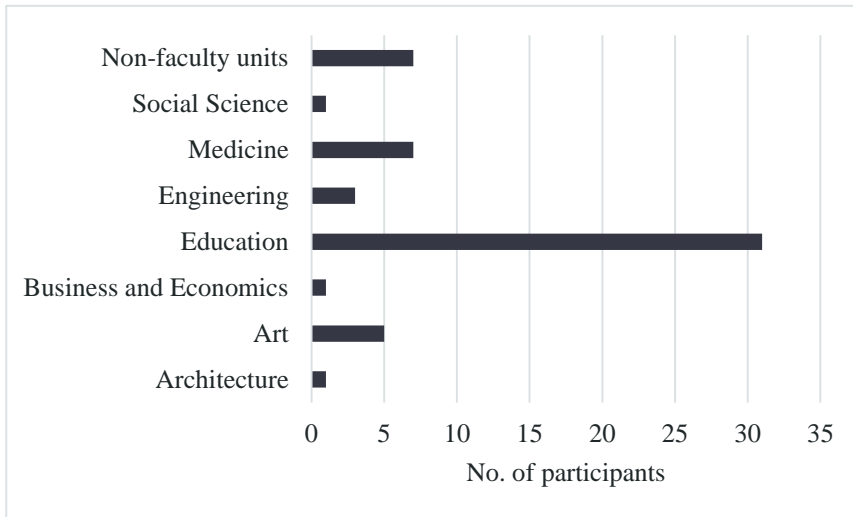
3 of them participated in 4 sharing sessions

2 of them of them participated in 5 sharing sessions

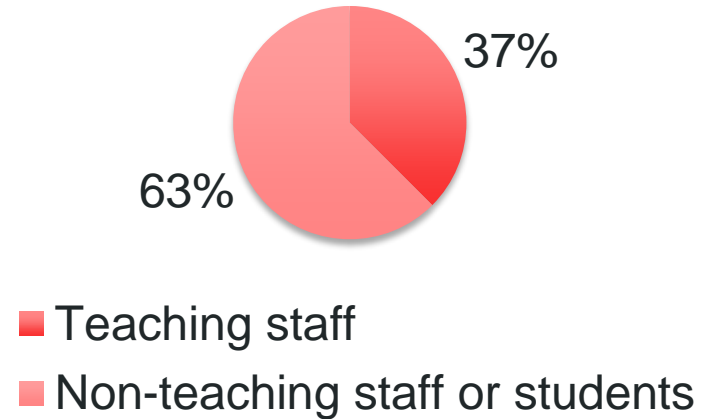


Results (Cont.)

Disciplines of participants

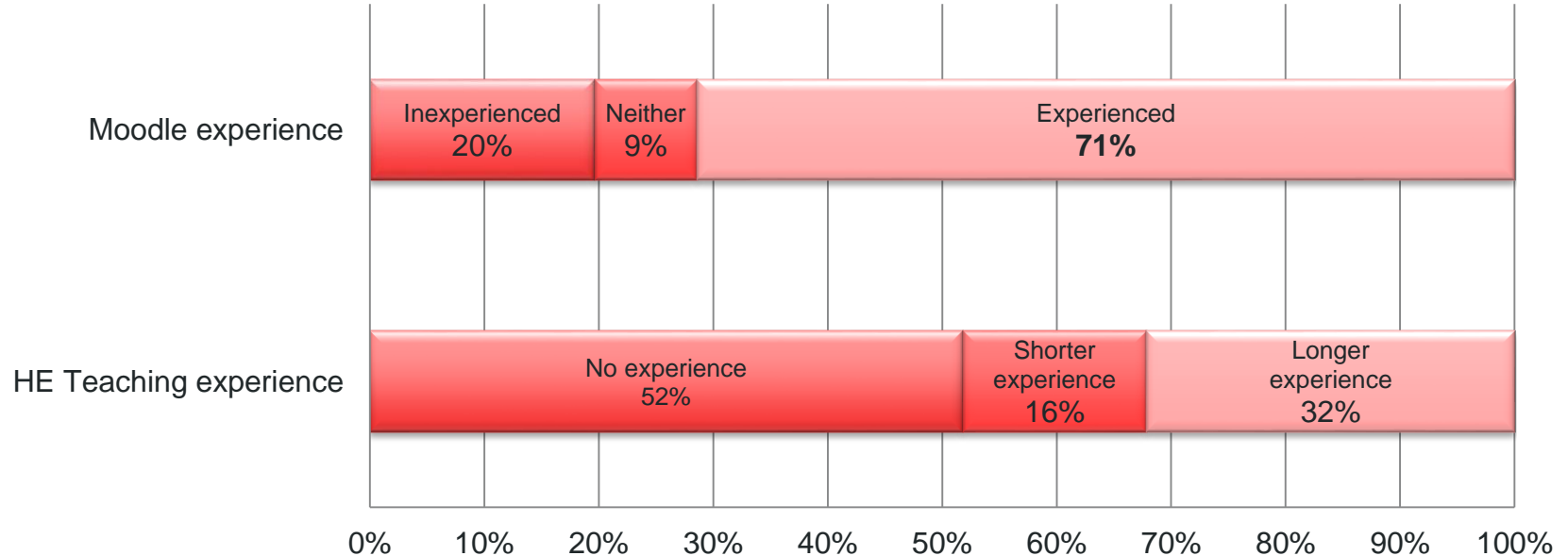


Role of participants



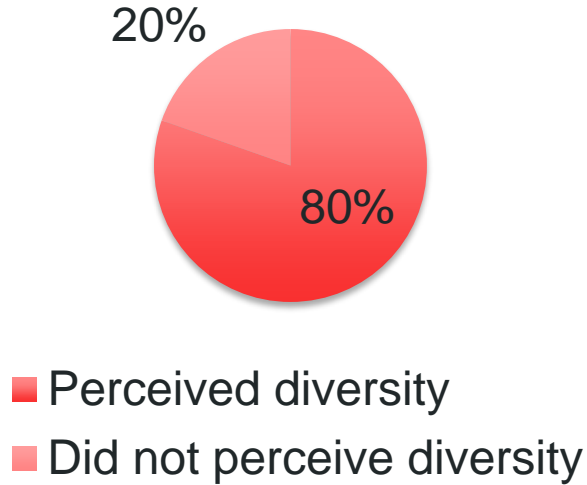
Results (Cont.)

Higher education teaching and Moodle experience of participants

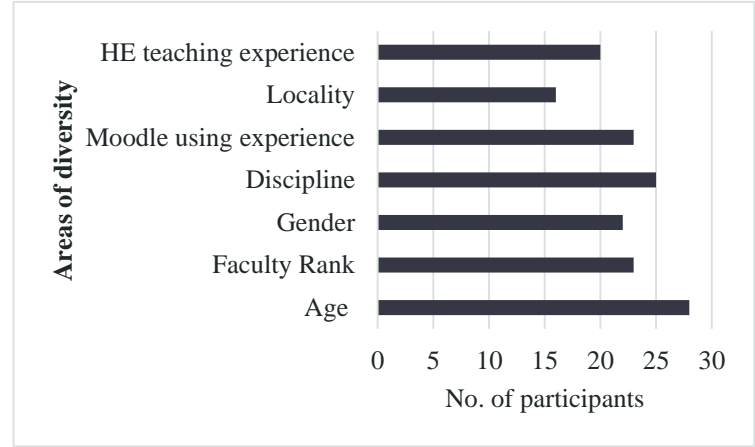


Results (Cont.)

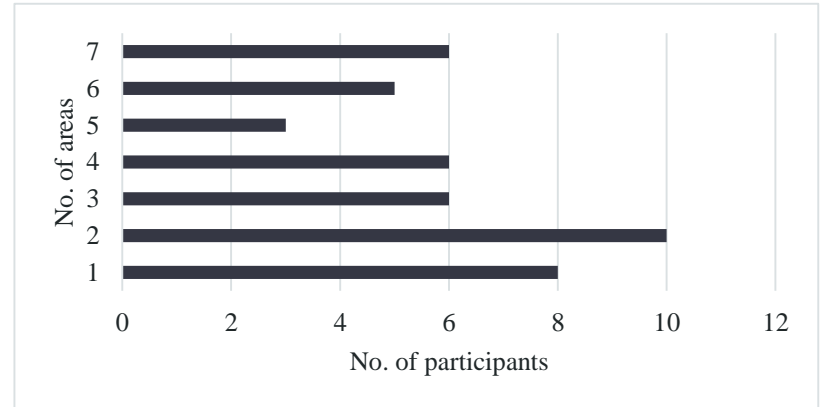
Perception of diversity



Perception of diversity in different areas



The degree of perceiving diversity among participants



Factor analysis of ‘experience of participation’ items

Experience of participation	Factor loading	Eigenvalue	% of variance explained	Cronbach's alpha
Imagination		1.54	11.9%	.70
I imagine about the possibility of this community	.758			
I imagine about the past and future of this community	.878			
I imagine about other participants in this community	.669			
Alignment		4.32	33.2%	.83
I make alignment between the community and my duty	.829			
I make alignment between the community and my interest	.871			
I make alignment between the community and my competency	.707			
Engagement		1.07	8.2%	.64
I engage in group activities	.839			
I engage in creating relationship	.623			
I engage in finding the past about the practice	.566			
Acceptance		1.73	13.3%,	.73
I find this community useful	.638			
I have difficulty to participate in this community	.737			
In the future, I will participate in this community	.728			
I will consider transferring the knowledge from this community to my own practice	.793			

Results (Cont.)

Descriptive statistics of four composites

	No. of items	M (SD)	Skewness	Kurtosis
Imagination	3	3.79 (.49)	-0.96	2.96
Engagement	3	3.76 (.65)	-0.49	0.37
Alignment	3	3.54 (.59)	-0.36	0.48
Acceptance	4	3.96 (.54)	-0.06	-0.79

Correlation between imagination, engagement, alignment and acceptance

	Imagination	Engagement	Alignment	Acceptance
Imagination	1.00			
Engagement	.27*	1.00		
Alignment	.34*	.52**	1.00	
Acceptance	.24	.23	.35**	1.00

*, Correlation is significant at the 0.05 level (2-tailed).

**, Correlation is significant at the 0.01 level (2-tailed).

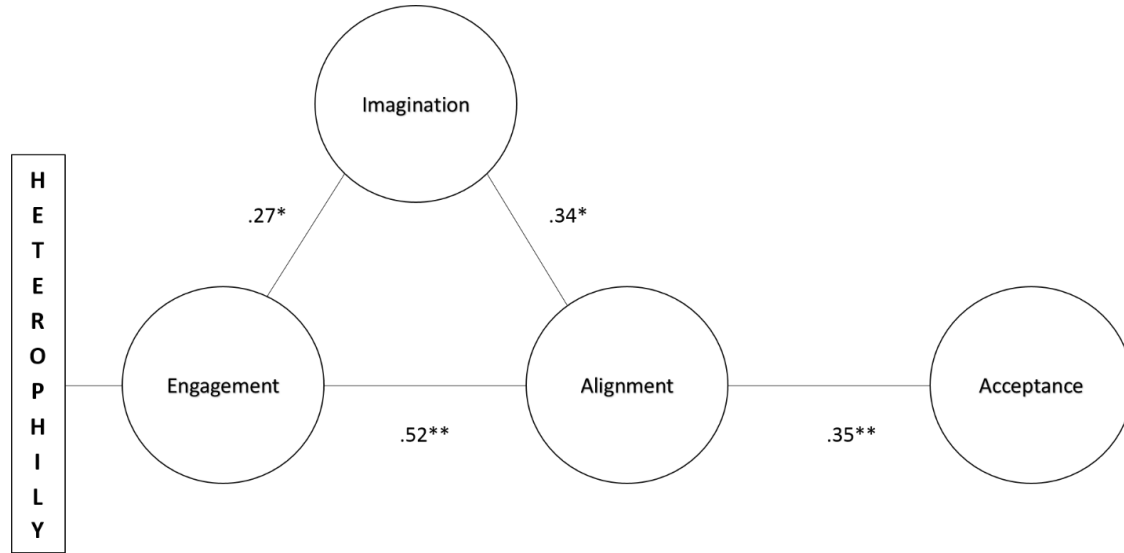
Results (Cont.)

The score of four composites between participants who perceived diversity and participants who did not perceived diversity

	Participants who perceived diversity	Participants who did not perceived diversity
Imagination	4.03	3.70
Engagement	3.86*	3.48*
Alignment	3.83	3.48
Acceptance	3.64	3.15

* Correlation is significant at the 0.05 level (2-tailed).

Results (Cont.)



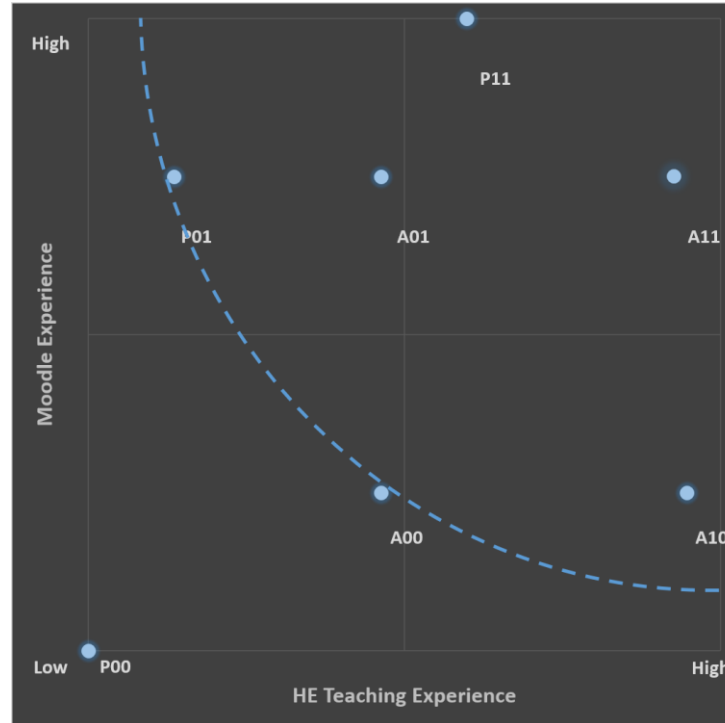
Results (Cont.)

Content Dimensions

Category	Example quotes
Subjective Heterophily	
- Heterophily as References	I think we are all from different backgrounds, e.g. like I am a teacher. (A11)
- Heterophily as Meanings	Many lecturers from different departments or faculties give me a lot (of) inspirations that helping me..... I think (participants from different departments or faculties) is the key diversity has impacted on my imagination. (P01)
Social Learning through Participation	
- Exploring Heterophily through Engagement	Actually I learn a lot from these seminars [sharing sessions], particular in listening to what teachers said (about) implementation and what students said about their feeling on using e-learning tools in campus. (P11)
- Appropriating Heterophily through Alignment	I learnt necessary skill, e.g. survival skill, from the community because we are using Moodle every day. If we can use Moodle effectively, that will save a lot of time. (A11)
- Supporting Social Learning through Imagination	I imagined there would be many people from different area, different company, different organization and it helps me.....I would like to build more connection with them [other participants]. (P01)
Differences in Social Learning among Different Participants	
- Active Participants & Peripheral Participants	So participation [in this CoP] probably is the first kind of engagement. The second kind of engagement is not just listening to them [other participants], but also becoming part of the community and help disseminating (Moodle use) more broadly. (A10)
- Experienced Participants & Inexperienced Participants	I understand more about these topics [Moodle use] by listening to others questions and listening to the speaker addressing the questions. So, these questions and answers have enhanced my understanding of the topics. (A00)

Results (Cont.)

Clustering of different participants



Discussion

1. Complex Moodle Practices and Heterophilous Communities of Practice

2. Social Learning in Heterophilous Communities of Practice

- Heterophily as Resources of Social Learning
- Heterophily as Sources of Social Learning
- Modes of Belonging as Different Phases of Social Learning
- The Requirement of Relevant Experiences

Conclusion

1. **Building heterophilous CoP is potentially beneficial for educational technologies adoptions.**
2. **It should be aware that inexperienced participants might encounter difficulties in learning.**
3. **Participants are also suggested to participate with different modes of belonging which are crucial for social learning in heterophilous CoP.**

Limitation

1. The uniqueness of this case might not be able to provide a generalizable understanding that could be transferred to other CoP directly.
2. There was an innovative way to observe modes of belonging in the community. A quantitative instrument was developed from the concept proposed by Wenger. The instrument might not be convincing enough for all audiences at this stage.
3. Since this CoP was formed by voluntary participation. No. of participants could be a major constraint in the research design.
4. The size of this community (n=97) is already large comparing to other studies. inferential statistics is still limited by the sample size, especially the large group difference between participants who perceived diversity and who did not.

Q & A