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## LEGITIMATE PERIPHERAL PARTICIPATION IN DOCTORAL EDUCATION: A MALAYSIAN PERSPECTIVE

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### ABSTRACT

Legitimate peripheral participation (LPP) in doctoral education is considered as a form of peripherality among doctoral students from a novice researcher to becoming a scholar. Participation of doctoral students in various types of community of practice (CoP) facilitates this process. There is evidence that doctorate students are lacking in acquiring adequate professional knowledge and skills during their doctoral training. Hence, the aim of the study is to explore the level of LPP of doctoral students in CoP to explore how CoP facilitates the development of knowledge and skills towards the academic profession. The study also examined doctoral students' participation in doctoral practices within various learning contexts and their mode of engagement. The study employed a qualitative exploratory case study research design and interviewed ten doctoral students that met the set criteria via snowball sampling technique. The findings suggest that students' participation in various types of CoPs, regardless of their mode of engagement in CoP, enables them to gather specific knowledge and skills that would be applicable in the academic profession. Another finding shows that through LPP, doctoral students seek guidance and assistance in overcoming challenges in their doctoral practices within CoPs. Drawing on the theoretical framework of CoP, LPP among doctoral students were described in the form of core, moderate or non-participation. Doctoral practices within the CoPs include conducting lab experiments, learning research methodology and academic writing, among others. This article builds on previous research on CoP in doctoral education specifically in understanding the transition of doctoral students from a novice researcher to a scholar through LPP. Implications on theory and practice along with recommendations for future research were also mentioned.

**Keywords:** legitimate peripheral participation, community of practice, doctoral education, professional development

## 1. Introduction

In a social learning system, Wenger (1998) introduced the notion of participation and non-participation into a community in the form of ‘peripherality’. This is referred to as either a small or non-full participation within the community. Theoretically, in the context of this study legitimate peripheral participation (LPP) in doctoral education presents a case of peripheral participation of a novice researcher moving towards full participation or an expert within the academic community, in which they would eventually become professional researchers or academicians.

The purpose of this study is to examine doctoral students’ perspectives on their participation in a community of practice (CoP) that is used to foster knowledge and skills in the academic profession. Thus, to explore the relevance of ‘peripherality’ within doctoral education and to understand the notion of apprenticeship from a novice to a master at different levels of doctoral study. The informants in this study had issues with academic writing, conducting lab experiments, statistical analysis as well as understanding research methodology, to name a few. Previous research reported that CoP helped doctoral students overcome challenges in adapting to new academic and social environments (Wazni et al., 2021).

There are arguments on the lack of attention on professional socialization in doctoral education (Nerad, 1999) which refers to a process whereby doctoral students obtain knowledge and skills to successfully integrate into their selected professions (Weidman et al., 2001). Essential knowledge and skills required in doctoral studies include, to be research ready, whereby once graduated, doctoral students will be able to produce academic writing, perform statistical analysis, create scientific reasoning, acquire a wide and deep knowledge of literature and recent debates, and able to apply the latest technological tools in research (McDonald et al., 2015). However, the inability to meet these pre-requisites may lead to insufficient knowledge and skills of becoming a scholar.

Cui and Harshman (2023) indicates that existing training in doctoral education programmes may be insufficient in equipping students for a multifaceted role of academia. Findings of the study suggested that graduate programmes ought to provide more opportunities for students to enhance their communication, project management, as well as interpersonal skills. In addition, another study also reported that graduate students frequently face significant challenges, including limited peer interaction and gaps in communication and collaboration (Ray et al., 2019). Furthermore, Verostek et al. (2024) also found students favour to work in research groups as it would benefit the outcome of the student’s doctoral journey.

Hence, this study aims to understand how each level of participation in CoP facilitates the development of knowledge and skills towards academic profession. Specifically, it investigates their engagement in various forms of CoP during different phases of their doctoral research. The focus is on how such participation helps them acquire essential knowledge and skills which would then contribute to their professional growth and transition into academic roles. Hence this article explores the level of participation and engagement within CoPs based on these research questions:

- 1) How is LPP explained in terms of doctoral students’ levels of participation in CoP?
- 2) What types of doctoral practices influence CoP participation among doctoral students?
- 3) What other benefits do doctoral students gain from participation in CoP?

## **2. Literature review**

### **2.1. Communities of practice in doctoral education**

Prior studies (Jones et al, 2024; Verostek et al., 2024; Lahenius, 2012; Parker, 2009; Shacham & Od-Cohen, 2009) have highlighted the benefits of Communities of Practice (CoP) established among peers and advisors within the context of doctoral education. These CoPs provide doctoral students with opportunities to enhance their academic writing and reading skills while fostering professional growth as researchers. Clark et. al (2021) mentioned that participation in CoP managed to enhance professional development skills and knowledge not just among doctoral students alone but also doctoral supervisors and other faculty members alike. The support and collaboration of supervisors in research are found to be helpful towards preparing the students in their future profession in terms of academic productivity (Jones et al. 2024; Shen & Jiang, 2023).

Newswander and Borrego (2009) focused on journal clubs as CoPs for graduate students. Despite differences in focus, both Leshem (2007) and Newswander and Borrego (2009) identified three key benefits of CoPs: (1) discovering new knowledge within a specific practice, (2) fostering problem-solving skills and creativity, and (3) enhancing understanding of shared repertoires through peer collaboration.

According to O'Donnell and Tobell (2007), adults in higher education engage with various CoPs during their learning experiences, where the meanings from experiences in these environments can determine the success of their participation. For example, doctoral students attending conferences and seminars participate in CoPs where apprenticeship interactions between novices and experts allow them to acclimate to professional contexts (Roberts, 2021; Chapman et al., 2009; Coryell & Murray, 2014). During their doctoral studies, students engage in situated learning through various forms of practice and socialization processes, eventually progressing toward full membership in scholarly and professional communities. Orsmond et al. (2022) pointed out on how LPP through CoP framework helped graduate-entry medical officers and pave the way for professional identity formation.

However, there has been limited theorization of CoPs in doctoral education (Lahenius, 2012). Shacham and Od-Cohen (2009) similarly noted a less substantial amount of literature addressing CoPs in postgraduate learning. This highlights the need for further exploration of CoPs within the context of doctoral education to emphasize the significance of CoP and its utility as a form of support. Furthermore, the existing literature also highlights a gap in understanding the LPP regarding the development of doctoral students' skills and knowledge towards their future academic profession.

### **2.2. Peer Support in Doctoral Education**

CoPs in doctoral education often take the form of writing and reading groups or discussions focused on research methodologies and practices (Logue-Conroy et. al, 2021; Verostek et al., 2024; Lahenius, 2012; Parker, 2009; Shacham & Od-Cohen, 2009). Shacham and Od-Cohen (2009) further noted that engaging in collective research through CoPs not only promotes interaction among students but also reduces feelings of isolation. The tendency for attrition becomes greater and the doctoral practice becomes challenging with an absence of a research group journey (Verostek et al., 2024). Similarly, Wisker et al. (2007) explored doctoral student

cohorts that fostered peer support and collaboration to address challenges related to doctoral work.

Additionally, Janson et al. (2004) observed that CoPs initially established for doctoral work evolved into forums for sharing emotional challenges associated with doctoral studies, helping students to mitigate isolation. Leshem (2007) examined cohort-based CoPs, where "communal tutorial discussions" were implemented at different stages of doctoral studies to aid in understanding and developing conceptual frameworks.

### **3. Theoretical framework**

#### **3.1. Communities of Practice**

Communities of Practice (CoP), introduced by Wenger and Lave in 1998, is rooted in a social theory of learning. This concept builds on the theory of situated cognition, which emphasizes learning knowledge and skills within contexts that mirror their real-life applications (Collins, 1989). Through interaction and participation in a social context, learners become actively engaged in a CoP (Lave & Wenger, 1991). Emphasizing activities within a community, CoP is a social theory of learning that assumes that "engagement in social practice is the fundamental process by which we learn and so become who we are" (Wenger, 1998).

In doctoral education, CoPs are recognized as informal learning communities outside the classroom, where they have proven effective in fostering collaboration and skill development (Shacham & Od-Cohen, 2009; Lahenius, 2012). CoPs are integral to doctoral education, grouping students into social learning systems that foster knowledge sharing through research within scholarly communities. Lahenius (2012) defined scholarly communities as "multiple relationships that result from the pursuit of shared scholarly interests and endeavours, providing the context for learning through certain social practices" (p. 29).

#### **3.2. Legitimate Peripheral Participation (LPP)**

Lave and Wenger (1991) expanded the idea of apprenticeship within situated learning into Legitimate Peripheral Participation (LPP). This concept focuses on how newcomers gradually integrate into a community of practitioners, evolving from novices to experts through sociocultural practices.

Based on the LPP framework, participation of doctoral students varies from newcomers or the apprentices to graduating doctoral students or the masters. New members start by engaging in peripheral tasks and gradually gain legitimacy and acknowledgment through their contributions. Collaborative learning enhances this process, as sharing ideas with others is central to effective learning. LPP aligns well with doctoral education, where students become acculturated to academic research through interactions with peers and supervisors. Supervisors play a critical role in guiding students toward active participation in disciplinary research communities while peers are seen as another form of support mechanism within the doctoral journey.

Wenger (1998) highlighted that identity is shaped by our ability to engage with and contribute to our communities, stating, "Our identity includes our ability and our inability to shape the meanings that define our communities and our forms of belonging" (p. 145).

Hence, Wenger (1998) further explained that CoP consists of three dimensions namely mutual engagement, shared repertoire and joint enterprise. Mutual engagement refers to the

interaction within the community that results from shared practices. Roles and relationships emerge from the engagement of members from various ethnicities, ages and gender. Shared repertoire, on the other hand, refers to the signs, symbols, tools and language that members share, which has a specific meaning within the community. Finally, joint enterprise is seen as a negotiated response from its members in terms of community goals and conditions. These interconnected dimensions allow its members to progress from peripherality to full participation in the CoP, should the members opt to do so.

In reference to the study, mutual engagement refers to doctoral students' interactions in CoPs within its shared repertoire of doctoral practices (i.e. lab experiments, academic writing) based on the expectations of doctoral education and its practices, as the joint enterprise.

## **4. Methodology**

### **4.1. Research Design**

The study uses qualitative inquiry to gain insights from the experience shared by the informants. Through in-depth interviews, this research approach was able to gather in-depth understanding of the experience and perception of the students. A qualitative inquiry allows the researcher to obtain detailed and rich information about participants' real-life experiences (Creswell, 2003).

This qualitative inquiry is based on an exploratory case study research design where ten doctoral students were interviewed from various faculties and at various stages of their doctoral study. The study examined doctoral students' levels of participation in CoP towards the development of knowledge and skills relevant to the academic profession.

One of the main characteristics of an exploratory case study is flexibility whereby researchers may adjust their research approach as well as data collection methods as new discovery of information emerges. This allows for a more organic and deeper understanding of the case. Therefore, exploratory case study should not depend on a framework that could influence the interpretation and lead the interviewer to frame informant's views within the researcher's own theoretical schemes (Kvale, 2006).

### **4.2. Informants**

The informants of this study consisted of ten full-time doctoral students enrolled at one selected public research university in the Klang Valley, Malaysia. There were 3 male and 7 female students in total, where six of them were from the Science discipline and four remaining students were from the Social Science discipline. Each informant was chosen based on the set criteria of being a full-time doctoral student at the university and aspire to become an academician once the student graduated. The study adopted a purposive and snowballing sampling technique in its data collection. Some of the informants were contacted via recommendation from other participants in the study and some were recommended by their own doctoral supervisors.

The students were at different stages of doctoral study and different fields of study. This is done to have a more varied and rich data in terms of their unique experience participating in a community of practice. However, the lived experience of the doctoral students in this study may not represent other doctoral students in general.

There are obviously differences in terms of the students conduct their research based on their fields of study. The social science or humanities students are generally trained by doing



literature reviews, writing, and attending seminars, whilst engineering students are inclined to be given more tasks and simulations of past experiments (Hasrati, 2005).

The details of each participant in the study are presented in Table 1.

**Table 1. Participants of the Study**

Participant	Country of Origin	Faculty	Field of Study	Current Semester	Gender	Age
Ahmed	Yemen	Engineering	Electrical Engineering	3	Male	32
Sonia	Malaysia	Educational Studies	Human Resource Developmen	11	Female	49
Hisham	Malaysia	Food Science & Technology	Food Science	12	Male	46
Mazlin	Malaysia	Educational Studies	Psychology	5	Female	32
Rose	Thailand	Agriculture	Agriculture Business	2	Female	33
Atilia	Malaysia	Medicine & Health Sciences	Nutritional Sciences	7	Female	39
Yasmin	Malaysia	Ecology	Developmental Psychology	3	Female	30
Asri	Malaysia	Engineering	Mechanical Engineering	3	Male	24
Rina	Malaysia	Medicine & Health Sciences	Psychological Medicine	3	Female	37
Sally	Malaysia	Food Science & Technology	Food Science	13	Female	44

#### 4.3. Data Collection

Each informant was given an information sheet regarding the study along with a consent form for the student to sign as evidence agreeing to participate in the study voluntarily. The first round of the interviews was conducted using a semi-structured interview protocol, and the second round of the interviews was conducted via e-mail correspondence.

Below are examples of questions in the interview protocol for physical and via e-mail correspondence:

##### 4.3.1. Interview Protocol:

Definition of CoP in Professional Development:

- At which phase of your study and which level of learning environment (i.e. unit/faculty/discipline/personal) were you involved in groups that facilitates your doctoral study and encourage professional development as future academician at the same time?
- Within those groups, what kind of activities that you participated in that contribute towards developing your professional skills? i.e. presentation skills, supervision skills, grant writing, people management etc.
- Why do you feel that there is a need to participate in related doctoral activities introduced by a certain group?

##### 4.3.2. Examples of questions via email correspondence to informants:

- Through your personal experience as a doctoral student, at which stage do you think the community will be most helpful and why?

- ii. What kind of knowledge and skills within the academic profession (examples as given above in question no.1) were you able to develop during your PhD study here?  
The data collection was put to a stop once the data reached a saturation point and it ended up with 10 informants. All interviews were then transcribed and analyzed using the Nvivo.

#### **4.4. Data Analysis**

Data analysis was conducted and guided based on Braun and Clark's (2006) six steps in thematic analysis were applied as well as NVivo Plus 12 software to facilitate documenting and categorizing the data gathered.

##### **4.4.1. Thematic Analysis**

Thematic analysis "is a method for identifying, analyzing and reporting patterns (themes) within data" (Braun & Clark, 2006). The analysis follows a step-by-step process of familiarizing with the data, generating initial codes, searching for themes, reviewing the themes, defining and naming the themes and finally, producing the report.

Therefore, the analytical process of this study initially identified codes from the interview transcripts which are separated into two groups of disciplines namely Science and Social Science in order to identify the differences in responses. Once the initial codes are gathered, revised and categorized accordingly, they are then developed into themes at the semantic level. This is done beyond describing the interview responses to focus on interpreting and explaining the meaning behind the words gathered from the interviews. The themes were reviewed several times and later the final report of the thematic analysis went through a process of peer review for validation purposes.

##### **4.4.2. Quality, Rigour and Trustworthiness (Reliability and Validity)**

In ensuring quality, rigour and trustworthiness, qualitative research requires methods. This study adopted data triangulation, informant validation (member checking) of the interview transcripts, audit trail and peer review.

### **5. Findings**

Based on the first research question, the outcome of the study unveiled the level of participation and engagement of the students based on the involvement of the students in communities of practice which facilitated their doctoral journey. The levels of participation are categorised in three levels, namely core participation, moderate participation and non-participation.

#### **5.1. Levels of participation**

##### **5.1.1. Core participation**

This form of participation is considered active, involving consistent engagement and fostering connections with other members in a CoP. Active members typically take the initiative to start and sustain communication within the group.

In reference to the CoP framework, based on the three dimensions of CoP, the peripherality in terms of core participation of a doctoral student, firstly showed active mutual engagement, whereby the doctoral students made the time and effort to participate in the community. Secondly, shared repertoires were visible, for example their doctoral study progress, activities for self-development and self-motivation as well as other research related matters. Finally, the



main joint enterprise is generally the cooperation that these students received from the members within the doctoral study community.

Atilia exemplified such participation in her CoP. She explained how she actively contributed and felt comfortable and motivated to engage with the community without any sense of awkwardness. Reflecting on her experience, Atilia stated, "We feel we are not alone, and we feel that we can share what we know, and we can ask what we don't know without feeling awkward."

Similarly, Sonia identified herself as an active participant in her CoP. She described her role as an 'instigator,' where she took the lead in initiating discussions within the group through social media. She said,

*But then we tend to discuss in WhatsApp group yeah... I do initiate certainly, but I would not say everything. But then when it came to semester six – when I had different groups, I will be the instigator of initiating and always try to get all these people to come together and discuss and meet and progress in their PhD.*

Hisham, a Food Science doctoral student, is another active member of a CoP which consists of members that were not from the same university. Hisham was already an academician by profession at one of the local private universities before he enrolled in doctoral study at the university. Hisham shared his views on the CoP he participated in,

*...for being an academician... it's part of me that when you do something good, you don't keep it to yourself – you need to share it with someone else. So, when I started with this special interest group, SIG not SIT, Special Interest Tourism. When I started this, I mentioned to them, we need to meet regularly despite of whatever ups and downs that we are having or despite of whatever problem that we are having... uhm it's not because for own's benefit... for everybody's benefit in the group. And this SIG or Special Interest Group – we are not uhm... elevating uhm...one's motivation for them to study or further study or to finish their study only but it's beyond that. It's more on the... how you develop character... personality... to... to...what we call that... to improve their teamwork.*

As for Sally, her active participation in a CoP was during her thesis writing stage. She considered her supervisor as one of the members in her CoP along with her other doctoral study colleagues from other faculties at the University. Sally explained,

*I also frequently visit my Professor before he retired to talk and probably discuss about my concern regarding my PhD. I visit him probably quite often. Sometimes just to listen to his advice really motivate you to not give up...This group that I involved help me a lot in enhancing my knowledge. Sometimes reading other students problem give you (the) idea on how to go about (doing) the research so you don't face the same problem...especially when you (are in the) writing up stage... this group help you a lot...*

Finally, Yasmin, a Development Psychology doctoral student in her third semester said she found it to be helpful to be involved in a CoP. She was also a research assistant at the faculty. The CoP she participated in include her supervisor, her research assistant colleagues, other faculty members and other doctoral students from different faculties. Yasmin maintained almost daily meetings with some of her CoP members. She said,

*Whenever we meet up... we will brainstorm (on doctoral research matters) ... we meet several times. Even when we go for lunch, we brainstorm... we will seek each other's opinions and if no solution is derived, I will usually bring it up to my supervisory committee ...*

### 5.1.2. Moderate Participation

Moderate participation refers to members of a CoP who engage at a moderate level. These members do not typically initiate discussions or activities but still contribute and remain valuable to the group.

As for moderate participation, its mutual engagement was not as frequent as compared to core participation. Hence, the doctoral students still managed to stay connected with other members of the community. Shared repertoires include activities held in the courses they enrolled in, lab experiments and other related matters on their current doctoral research. Joint enterprise were visible through responses from other doctoral students in the faculty, course mates and other postgraduate students in the same research area.

For example, Mazlin described her level of involvement as moderate within the WhatsApp group of a CoP she participated in which was initiated by a faculty member.

*It would be easier if we meet each other, face to face, I can be active... depends on active members there. But if in the WhatsApp group, I am hesitant. I don't know, I am just the type... who doesn't like to type I guess (laugh)...everybody does voice notes right? But that is the thing, ...I prefer to have it face to face, it would be easier.*

In the meantime, an international doctoral student from Thailand, Rose, considered herself a passive member of the CoP. She participated occasionally and felt more comfortable engaging only after building familiarity with other members of the community. Some of the members in her CoP were in the same class. Hence, her communication and participation with the rest of the members was via WhatsApp. Most of the time the engagement takes place virtually. However, she found that communicating with different members in the CoP, required a different approach due to their different academic backgrounds. Rose stated,

*Oh... 80 percent WhatsApp... And we can only meet face to face (in) the class. Aaa...but for the ...in the study part, in the class, can talk and can share with them, it's okay... and okay I think I go back my home and think. I am thinking something and then uhm...then WhatsApp them. Something I start or something just a chit chat... I have to ...organize and select. How can I talk to them. This one like this...how can I talk with this one. Aaa...so, because they are different background. I have to prepare myself...how can I connect with them. Another is like a very young girl...just graduate from the Bachelor (degree). So, they are taking Master's (degree) so how can I connect them and how can I gain new experience and knowledge from them? Another is he is a very experience ...more experience, so how can I get some information from them. That I created in the group.*

Meanwhile, as in the case of Ahmed, he found that by occasionally participating in a CoP at a research center in the faculty, helped him to discover and learn new knowledge and skills. Ahmed opined,

*Yeah, you need people to help you - or some time, you can join other people to help them in your work even (if) it is not related. For example, someone came here to do some stuff so maybe you go and see how he do this. Maybe you just join him and ask him to help, if he need your help and just see how he do things. So, then later when you reach that stage of doing experiment or doing your things, you have little bit idea. I mean just don't sit and just watch. Yeah, maybe you need to participate in maybe in something that is not related to you. Even you can make connection as well..., usually I am not the only one who receive the information. Sometimes even when you go there, you'll find someone who will ask you and you have to teach them and you discuss with them. I mean you give your information. Something like give and receive. It's not like you just take, take, take. Sometimes it's like you exchange roles. I*

*mean like, seniors you'll take information, but juniors, they will ask you from there they come here and they ask for my help. Sometime, like maybe teach them ...like we have clean room here – how to do fabrication and stuff.*

Another case to mention would be Asri, an Engineering doctoral student who was also categorized as a CoP member with moderate participation. The CoP included his supervisor, co-supervisors and a couple of other international doctoral students who were in the same research project. His engagement with other members of the community was minimal. However, his participation in the CoP was mainly physical meetings with the supervisors and occasionally with the other students. Asri said, "We have a common WhatsApp group but I hardly use it". He opted to communicate with the members individually.

However, Asri has another separate CoP which consisted of his other fellow postgraduate students. He found the group to be helpful and so, he engaged with the community more frequently. Asri stated,

*I share with my colleagues...my friends who are here. There is a student community... postgraduate community. I am very close with them, especially with Master's students...I share and exchange ideas... like how to manage this thing (research project)...*

### **5.1.3. Non-participation**

In a CoP, non-participation is also recognized as a form of participation, characterized by the member's presence in the community without actively engaging. According to Wenger (1998), non-participation does not imply exclusion from the community but suggests that participation naturally occurs through their presence within the social context.

As for a non-participant, there was hardly any form of mutual engagement. However, the shared repertoire would be their doctoral research work and joint enterprise was other doctoral students for the same university and other doctoral students elsewhere.

In this study, Rina, a doctoral student in psychological medicine, identified herself as a non-participative member of a CoP that was available to her. She acknowledged that her involvement in the CoP was minimal. The group primarily comprised fellow doctoral students from the same course during the early stages of her studies. Although Rina maintained her presence in the CoP's WhatsApp group, she chose not to engage actively. Her case was considered a single negative case analysis. Reflecting on her experience, Rina shared,

*(I am) Not the most active... I think the most active (almost) viva already... Okay...like me, (when) I think I need my time but I think I, I would be more...I know when... when I should not be alone and then I reach out...*

Rina generally preferred working independently rather than in a group, which is why she was categorized as a negative case in this study. However, she acknowledged that being part of a community could help her monitor the progress of her doctoral studies. Reflecting on this, Rina stated, "Having a group would have provided me with a tangible reference with regards to my performance, for example, whether I am lagged behind or I am on the right track."

She further explained that, while she valued the benefits of a community, she preferred minimal interactions and less frequent meetings among its members.

*I like the fact that because, we don't get to meet up to often, and usually we don't talk much in the WhatsApp group anyway, but the fact that we know they are there...so when you have a problem you know who you can ask on that specific question that you have...*

## **5.2. Types of Doctoral Practices in CoPs**

All informants clearly mentioned doctoral practices that emerged from the data. Here are some examples of them, explained under respective themes:

### **5.2.1. Collaboration and Knowledge Sharing**

Ahmed, a foreign doctoral Engineering student from Yemen, who was in his third semester reported saying that discussions were held whenever he met with other members of the CoP who are currently doing doctoral study. He mentioned that,

*"we discussed about research – what you did, what did you publish... Sometimes we have some workshop...and we do have a workshop... usually about higher research impact...on publication, how to publish and how to send and how to respond to reviewer"*

### **5.2.2. Skill Development and Mentorship**

Ahmad also said he became a part of a research community at the faculty whereby he managed to gather advice and guidance on how to conduct his lab experiments. He had also able to acquire materials for his lab experiments through this community;

*that's the thing, you have more connection. Other group from there also if I need some things like procedure or protocol or something – I just go there.. Other people there, they have the same material. They don't use it anymore or they take what they want and then they just keep it. So you just take what you need and you can use it. No need to buy new.*

Yasmin, on the other hand, had the opportunity to develop her skills and knowledge in data analysis within her community of practice at the faculty. Her community include, the faculty members, her colleagues as well as her fellow doctoral students at the faculty. Notably, she eventually became a reference point for others to come and seek help regarding statistical analysis for their research.

*...there are people who invite me to give a workshop... workshop on basic SPSS. How to key-in data, to analyze simple-simple statistics... and then during my PhD, one of the Associate Prof. Dr. R also invited me to assist him in giving ... training in research methods for IRB officials.*

### **5.2.4. Academic Writing and Publication**

Similarly, with Sonia, her community encouraged her to write publication required for her doctoral degree. She also managed to help other members in her CoP in terms of academic writing for publication;

*...so I pretty much helped on their publication...reading and understanding and changing. Because when I read their publication, they are beside me. So, when I asked – what is the content. We pretty much discussed and correct everything for them. That's one thing that motivated me to do my publication as well. So, it was not difficult to do publication when I read theirs ...*

Meanwhile, Sally said the CoP she participated in, enabled her to develop the knowledge and skills towards becoming a scholar. She opined,

*I learn a lot on how to write a paper, how to publish, how to manage time and such. I also learn how to communicate better in writing and in speaking. I learn speak effectively and how to think critically. Since we are doing a lot of data analysis and discussion be able to think critically is critical to us.*

#### **5.2.5. Progress Monitoring and Feedback**

Ahmed and Sonia also shared their experience whereby CoP they participated in, facilitated in ensuring the progress of their doctoral study. Ahmed was quoted stating that, "... the people in the next lab, usually we gather some time together. Just share okay, have you done your progress report, have you done your presentation... how was your supervisor". Sonia added that the members of her CoP shared their progress with each other,

*...So these people were forms of motivation, we discussed in the group – there were six of us, it's multiracial and we were competing among each other in a healthy way where we will update each other on what we were doing...they were also motivating where we have updates about each other's progress, and we share...*

### **5.3. Other Benefits from Participation in CoP**

Findings have showed that through the LPP within doctoral students' involvement in CoP, offered other benefits to students during their doctoral journey. These are the themes that emerged based on the results:

#### **5.3.1. Motivation and Peer Support**

Based on the data gathered in the study, CoP has found to be the source of motivation and peer support for its members. Sally for one, agreed that doctoral study could be taxing on certain occasions and therefore, she found that CoP was one of the reasons why she kept remains determine to complete her doctoral study;

*I also learn how to handle my stress with this group. I think this group keep me grounded and sane. Most of the time you feel down and tired and ready to give up but your group keep you going...*

Similarly, Sonia also opined those other members of her CoP motivated her and at the same time created a sense of positive competition among them;

*So these people were forms of motivation, we discussed in the group – there were six of us, it's multiracial and we were competing among each other in a healthy way where we will update each other on what we were doing... if there are any questions and they will also guide me on how to actually leverage on statistics itself or on other aspect of education.*

#### **5.3.2. Promote a Sense of Belonging**

There is also evidence that CoP enable to promote sense of belonging within the doctoral education context and subsequently helped to avoid the feeling of isolation among doctoral students. Asri believed that being a part of a CoP becomes crucial,

*...(If) we isolate ourselves from this community, we will have a kind of... when we are facing a problem, a critical problem we will be like "Eh, how do we do this?" So, when we have found with this group, we discuss. We will come out with new ideas on how to tackle the problem when we conduct research, so it really feels very compulsory...*



Sally had a similar view as Asri, she mentioned that the community helped her to not feel lonely. She said,

*...my group of friends are the type of friends that never turned you down if you have a problem. They help you, they sometimes nagged at you but most of the time they willing to listen to your nonsense. I think I'm lucky enough to find a group of students that together we learn, we fight and be comfortable with each other. The journey of my PhD is not lonely with this group of students that I have my confidence with ...*

### 5.3.3. Character Building

Another advantage gained through participation in CoP was the ability to build the character of doctoral students in terms of staying motivated, resilience and persistent in carrying out the duties within doctoral study. For instance, Hisham viewed CoP as a community that is more than just being academically oriented. He opined that the CoP he participated in helped to develop the members' character. He said, the discussions they had in the CoP were as such:

*we are discussing about anything relating to the spiritual part... uhm... how to push another person to another level, you know? Based on the motivational spiritual teamwork... one's motivation for them to study or further study or to finish their study only but it's beyond that. It's more on the... how you develop character... personality... to... to...what we call that... to improve their teamwork...*

## 6. Discussion

The findings, based on the derived theme of participation and engagement, highlight Wenger's (1998) concept of legitimate peripheral participation occurring across various domains and learning environments. Whether at the core, moderate, or non-participation levels, the journey from novice to mastery unfolds through a range of doctoral practices such as conducting lab experiments, mastering research methodologies, and engaging in academic writing.

Hence, Wenger (1998) describes participation as "mutual ability to recognize meaning" (p. 56), emphasizing that true participation happens when members of a community share an understanding of meaning and identity. Roberts (2021) said that socialization in doctoral practices eventually transform towards a scholarly identity in their respective fields. In the context of this study, all informants as doctoral students are considered as legitimate peripheral participants regardless of their field of study since they are still novice researchers and have yet to master scholarly skills. Ranging from second semester, right up to thirteenth semester these doctoral students were mostly full-time students registered at one public research university, who aspire to become academic professionals once they graduated. For them to be selected for this study, they would have participated in at least one CoP during their doctoral study.

The aim of the study is to examine doctoral students' perspectives on their legitimate peripheral participation via CoP that is used to foster knowledge and skills in the academic profession. Therefore, the study opted to have a wide range of doctoral students at different phases of their study consisting of Science and Social Science fields, to provide rich experience and gather a variety and deeper insights in their CoP involvement. For example, more advanced phase doctoral students offer a more professional perceptions on the importance of acquiring necessary skills within academic profession as compared to the junior ones, who are more focused on participation of CoP based on courses they enrolled in. These experiences may serve as a guide for future doctoral students in CoP, where they can make the most of their doctoral study preparing for their future academic careers.



The extent of participation corresponds to the individual's level of expertise within the CoP. Core participants are considered experts, while even those on the moderate level of participation or even non-participants remain connected through socialization process within the doctoral students' CoP. As Wenger (1998) notes, "Even drastic isolation...is given meaning through social participation" (p. 57). The way students engage within CoP depends on how frequently and in which manner they interact, which Wenger (1998) termed as "mutual engagement."

The findings further demonstrate that the students met physically on campus, engaged in group discussions, attended supervisory meetings, collaborated in study sessions at the library, and attended casual gatherings at their usual eateries. However, digital platforms also play a role, with some students maintaining their participation through WhatsApp groups. These virtual spaces allow for continuous communication and collaboration, ensuring that the group remains active, members stay connected and engaged. According to Dubé et al. (2005) CoP which initiated in a physical setting has now evolved with technological advancement and so, many has opted for virtual CoP (vCoP) when it comes to interacting with others. Through vCoP, an expert or a scholar can reach more novice researchers to transfer knowledge, create network among fellow doctoral students and cultivate innovation (Thoma et al., 2018). Therefore, vCoP serves as an opportunity for shared learning (Yarris et al., 2019).

Another result to this study illustrates the types of doctoral practices that influence participation in CoP which includes in the form of supervisory meetings, research groups, self-development group as well as a coursework group. These are categorised into their respective themes namely, collaboration and knowledge sharing, skill development and mentorship, academic writing and publication and progress monitoring and feedback. Therefore, the practices respective of their fields of study included conducting lab experiments, understanding academic writing and research methodology, attending academic courses and discussing progress of doctoral study. Engagement of doctoral students in research groups and meaningful discourse among members of the community within a structured activities could enhance their doctoral research experience (Ahmad et al., 2023). Subsequently, these practices enable to facilitate the development of knowledge and skills towards the students' future academic profession.

The findings also showed other benefits of participating in CoP. These finding are explained in three main themes namely, motivation and support, sense of belonging and character building. Results showed that being part of CoP promotes the sense of belonging and not to feel isolated. Other benefit included the ability of CoP towards developing doctoral student's character and personality along with other members of the community, specifically towards better teamwork. Hence, this exemplifies and becomes parallel with the previous research that indicated on how participation in CoP contributed to scholarly development, peer support, friendship, and a sense of belonging to a community to overcome isolation (Ahmad et al., 2023; Lahenius, 2012; Lasig et al, 2013)

## **7. Limitation**

The data gathered from this study does not represent the experience and perceptions of doctoral students in general. However, the findings demonstrate the experience gathered from doctoral students' participation in CoP in one public research university in Malaysia which can be of reference to postgraduate students' management in Malaysia or elsewhere.

The second limitation is the fact that as a single researcher and within the limited time to conduct the research, the study is limited to one public research university in the Klang Valley rather than opting for all public research universities in Malaysia. Meanwhile, another limitation of the study is that it focuses on the participation of doctoral students at different stages of their doctoral study hence, socialization experience may vary depending on the academic activities the students participated in. One student's experiences at one stage of their study cannot be generalized to the experiences of another student at a similar stage.

## **8. Implications and Recommendations for Future Research**

This study underscores some theoretical and practical implications regarding LPP in doctoral education through various communities of practice (CoPs). Theoretical implications include emphasizing on LPP as a significant process in doctoral education. It highlights how LPP facilitates the transition from a novice researcher to an expert within CoPs by encouraging skill development, identity formation, and professional growth. Besides that, by understanding how CoP becomes a praxis in doctoral education particularly in the context of Malaysian doctoral education, where engagement with CoPs influences students' socialization into academic profession. Finally, theoretically the findings show the emerging social and digital context in terms of participation among doctoral students in CoPs. The dual roles of physical and virtual CoPs in fostering academic development, suggests that virtual CoPs (vCoPs) may bridge gaps caused by isolation in doctoral journeys.

In reference to the first research question on how LPP is explained in terms of doctoral students' levels of participation in CoP, the results indicated that levels of participation in CoP differ in terms of purpose based on the field study and phase of study. Therefore, theoretically, formation of effective CoPs ought to be given attention by department, faculties and universities during in the initial phase right up to the final phase of doctoral study based on the current doctoral practices' requirements. For example, more emphasis ought to be placed upon professional skills towards the end of their doctoral study. However, throughout the doctoral journey, non-academic related issues, i.e. character building and spiritual enhancement, may also be an element to be focused on within CoPs among doctoral students

Meanwhile, in terms of practical implications, CoP serves as a form of support system for doctoral students, therefore developing and maintaining a variety of CoPs within postgraduate community at the faculty or university level may greatly contribute to fostering doctoral students' academic and professional growth and consequently alleviate the sense of isolation commonly faced by doctoral students as indicated in the findings of the study. A subsequent practical implication is the role of supervisors and peers in doctoral education are seen as instrumental in supporting students' LPP. Organized group activities, regular supervisory sessions, and collaborative research initiatives may strengthen engagement and facilitate knowledge and skill development. Another implication in practice includes the flexible participation in CoP within the doctoral education journey. By recognizing varying levels of participation (core, moderate, or non-participation) in CoPs helps tailor interventions to accommodate individual needs and preferences in developing their knowledge and skills.

Based on this study, some recommendations for future research include exploring on how LPP manifests in CoPs cross culturally across different cultural and academic environments. This could possibly provide new perspectives on CoP as the praxis in doctoral education. In the meantime, since the results indicated that mode of mutual engagement among doctoral

students also came in the form of virtual communication (i.e. Whatsapp) therefore, this shows, the application of vCoPs seems to be applied extensively in higher education context at present. Following that, it seems appropriate to investigate the role and effectiveness of vCoPs in fostering doctoral students' academic and professional growth. This could eventually help to expand and develop integrated frameworks combining CoP with modern technological tools to address gaps in physical engagement. Thirdly, to conduct longitudinal studies in tracking students' participation in CoPs from their novice stages to becoming experts whilst identifying key turning points within their professional socialization. Finally, other suggestion based on this study includes establishing more CoPs that caters to the need of doctoral students that could provide professional development opportunities for doctoral students toward academic and non-academic professions.

## 9. Conclusion

In the context of doctoral education, CoPs encourage students to engage with diverse research communities, develop their academic identities, and foster a sense of belonging. This engagement leads to a more meaningful and enriching doctoral experience, enabling students to thrive as members of scholarly and professional communities. Hence, this study underscored the importance of participation in CoP in preparing doctoral students with professional skills and knowledge regardless of their stage of study.

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