AKADÉMIAI KIADÓ

Teacher learning and professional development in school-university partnership: How do mentors learn?

KHIN KHIN THANT SIN* ⓘ

Faculty of Education and Psychology, Eötvös Loránd University (ELTE), Budapest, Hungary

RESEARCH ARTICLE

ABSTRACT

This study investigates teacher learning and professional development in school-university partnership in Myanmar. This study explores teacher learning and professional development through engaging in a school-university partnership through mentoring activity. Research studies have shown mentoring can improve teachers' learning and professional development (Hargreaves & Fullan, 2000). A sequential explanatory mixed-methods design was applied in this study. Participants were 120 schoolteachers in the quantitative part while 4 participants were interviewed. This study aimed to answer how the impact of school-university partnership on teacher learning and professional development can be understood. To answer this research question, two groups of schoolteachers (mentor and non-mentors) and three groups of teachers based on communication level with student teachers were compared. The results showed that teachers who had mentoring experiences improved their professional skills and competencies more than non-mentor teachers mainly in the areas: pedagogical content knowledge, knowledge about learners' behaviours and characteristics and cross-curricular skills. Furthermore, teachers who had intensive communication with student teachers showed higher mean values in self-confidence, enjoyment in teaching and reflection on teaching practices and feeling like a responsible person in education. Findings from the qualitative part showed that teachers learned these skills and competencies through intensive collaborative activities such as discussing teaching and learning, guiding student teachers in their classroom management and planning a lesson and having a friendly conversation with them. Overall, this

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* Corresponding author. E-mail: khinthant5@gmail.com

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study confirms that engaging in school-university partnership through mentoring enhances mentors develop their self-confidence, and enjoyment in teaching as well as their professional knowledge and skills.

INTRODUCTION

In developed countries, the collaboration between schools and universities is encouraged from pre-service teacher training to research and innovation. Collaboration and communication between different sectors in education play a significant role in the 21st century as knowledge explosion and production increase. In this knowledge age, teachers face much more challenges than in the past as demands on teachers' qualifications and skills are increasing and teachers are trying to fulfil these demands by upgrading their knowledge and skills. Learning alone within one community is not enough to overcome these challenges in the teaching profession (Kovacs, ThantSin, & Nurmukhanova, 2020).

Since the 1980s, teacher collaboration and networking have been favoured by several scholars introducing teacher collegiality, teacher professional learning communities and knowledge producers, teacher researchers, etc. (Cochran-Smith & Lytle, 1999; A. Hargreaves & Dawe, 1990; D. H. Hargreaves, 1999; Stenhouse, 1988; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Stoll & Louis, 2008; Vescio, Ross, & Adams, 2008). In the past, universities trained teachers through lectures and professional workshops and were considered as receivers of produced knowledge. Nowadays, the role of teachers has changed from receivers to knowledge producers. As a result, teacher educators become one of the most responsible persons for training pre-service teachers, novice teachers as well as their colleagues. In some cases, teachers and university researchers often work together in research projects to improve student achievement and school improvement (McLaughlin, 2006; McLaughlin, Black-Hawkins, & McIntyre, 2004).

This study investigates teacher collaboration between schools and universities in mentoring where teachers take major responsibilities for training pre-service teachers. This study focuses not only on how mentor teachers communicate with student teachers but also on how teachers can also learn from their mentees through collaboration.

THEORETICAL CONSIDERATIONS

The role of school-university partnership (SUP) in teacher learning and professional development

According to the literature review, SUP serves different functions to support the development or reform of the education system. This section discusses different functional areas of SUP in education to highlight its role in teacher learning and professional development. Based on literature concerning SUP, four different areas of SUP have been found; (i) teacher education

and professional development, (ii) research development, (iii) school improvement, and (iv) university improvement (Baráth, Cervantes, Gábor, Kovacs, & Nurmukhanova, 2020; Cochran-Smith & Lytle, 1999; McLaughlin et al., 2004; Saito, Imansyah, Kubok, & Hendayana, 2007; Suratno & Cock, 2008; Zeichner, 2010).

Teacher education, especially initial teacher training is the birthplace of SUP during the 1980s (Holmes Group, 1990; A. Tsui, Edwards, Lopez-Real, & Kwan, 2009). In the United Kingdom and the United States, the decline in the qualification of teacher education led to the birth of SUP during those periods (McLaughlin, 2006; A. Tsui et al., 2009). These concerns led to establishing professional development schools where schoolteachers, student teachers, and university teachers were expected to work together to improve initial teacher education. Besides the improvement of initial teacher education, professional development schools also served to improve research development, to encourage the connection between theory and practice in teacher education as well as for the professional development of schoolteachers and mentor teachers (Holmes Group, 1986, 1990). In this way, the collaboration between schools and universities was initiated in teacher education.

Another area where SUP supports teacher learning and professional development can be seen in the school networking and research movement. This is a composite function of SUP where it serves not only to support schoolteachers for their learning and professional development but also their research skills and knowledge (McLaughlin & Black-Hawkins, 2004; McLaughlin et al., 2004, 2007; McLaughlin, 2006). Furthermore, school improvement and university improvement agenda were embedded in this activity of SUP since universities and schools are working together on a research project through networks of schools. These kinds of projects have shown significant improvement in teacher learning and professional development as well as school and university improvement (McLaughlin, 2006; McLaughlin et al., 2004, 2007; McLaughlin & Black-Hawkins, 2004; A. B. M. Tsui & Law, 2007). One example can be seen in European Doctorate in Teacher Education (EDiTE) project where schools and schoolteachers were helping doctoral students in their research (Baráth et al., 2020; Kovacs et al., 2020)). Not only this EDiTE-SUP project provided young researchers but also it created learning opportunities for schoolteachers and principals.

FACTORS INFLUENCING THE NATURE AND POTENTIAL OF SUP

Besides the importance of the role of SUP in teacher learning and professional development, there needs to be consideration of the factors or forces which shape the nature and potential for SUP in educational change. Day, Gu, Townsend, Andrew, and Holdich (2021) identified three dynamic forces which can influence the nature and potential of SUP for educational development including policy dynamics, intellectual dynamics, and relational dynamics. To have the most effective SUPs for supporting educational change, professional development, and educational outcomes, these three forces should not be neglected.

The hierarchical power of educational policy influencing the practices and nature of SUP can be in different forms, such as funding opportunities, resources, and accountability measures (Day et al., 2021). For example, when the governments started school-based development or school-centered training with funding priority to schools, the previous 'ivory tower' status of universities had to withdraw. This led universities to collaborate with schools by changing their

'isolated' status through conducting research projects and making research applications closer to school practices. This showed one of the examples of how 'policy dynamics' had a significant impact on the nature of SUP.

For the intellectual dynamics, Day et al. (2021) claimed that powerful and intellectual learning happens when schools and universities work together for their shared goals. Furthermore, vice versa, today's society, and economy demand and value the creation of knowledge. This demand in global society has highlighted the benefits and opportunities offered by school-university partnerships as they can provide platforms for information, knowledge, resources, experiences, expertise, and capacity to create new ideas and good practices to be shared and applied (Day et al., 2021). Finally, the relational dynamics encourage partners from different organization to learn and work together for shared purposes. There is always something to learn from each other in partnership even though they are in the same business: education (Goodlad, 1988).

MENTORING AND TEACHER LEARNING

Hargreaves and Fullan (2000) outlined four stages of the changing nature of teachers' professionalism: (i) the pre-professional age, (b) the age of the autonomous professional, (c) the age of the collegial professional, and (d) the fourth professional age (A. Hargreaves & Fullan, 2000).

In the pre-professional age, teaching and learning were considered as an activity of recitation or lecturing. Teachers were assumed who need little training or continuous professional learning. According to Hargreaves and Fullan (2000), mentoring at this age did not go far beyond giving and suggesting 'tips' offered in a staff room. In the autonomous professional stage, teachers got autonomy to manage and teach their classrooms and worked separately. Although mentoring was introduced in teacher education, it was only considered for novice or incompetent teachers. The age of the collegial professional occurred by the mid-1980s, and it was the age where SUP was born in teacher education. Teacher collaboration and communication were strongly favoured in this age and *'collegial professionalism means working with learning from and teaching colleagues'* (Hargreaves, A. & Fullan, M., 2000). Due to the knowledge explosion, increase in students' needs, and special education and curriculum demands, creating collaborative cultures were pressured upon teachers. This was the age when school mentoring programs were initiated.

The fourth professional age is where we are now in the 21st century. Different social, economic, political, and cultural transformations have continuously challenged teachers to pursue their learning and professional development. Mentoring is not only considered for the novice or incompetent teachers; it is also considered for all teachers in the system to support their continuous learning and professional development as well as emotional improvement (A. Hargreaves & Fullan, 2000). Research about mentoring and teacher development has been produced as it has become the leading source for teacher training and professional development in teacher education (Astrove & Kraimer, 2021; Elliott & Calderhead, 1995; A. Hargreaves & Fullan, 2000; Rekha & Ganesh, 2012).

Although mentoring is usually considered for the professional development of mentees, there were research studies that claimed that mentors also learned from mentees and their colleagues (Aravena, 2018; Astrove & Kraimer, 2021; Elliott & Calderhead, 1995; A. Hargreaves & Fullan, 2000; Nilsson & van Driel, 2010; Rekha & Ganesh, 2012; Rhodes & Beneicke, 2002).

According to Rekha and Ganesh (2012), mentors learn soft skills such as interpersonal skills and leadership abilities, and they also learn to build trust by mentoring others. In the study of mentoring novice principals by Aravena (2018), mentors who are the trainers of those novice principals began to understand those different perspectives which they did not know before, such as: how the school system works, and how the schools offer opportunities and limitations for school and professional development. In addition, the study showed that mentors became good listeners. In the case of teacher education, mentor teachers learnt instructional knowledge and subject matter knowledge through mentoring student teachers (Nilsson & van Driel, 2010).

Studies also showed that teachers and student teachers increased their confidence and self-efficacy through participating in mentoring (Chizhik, Chizhik, Close, & Gallego, 2018; Saffold, 2005; Yost, 2002). According to those studies, mentoring not only gives a reflection on teachers' practices which lead to professional development, but it also supports teachers' emotional health to improve their self-confidence and enjoyment and motivation in teaching.

METHODOLOGY

A sequential explanatory mixed-methods design (QUAN-qual) was utilized to better understand teachers' learning and professional development within the context of SUP. As this study investigates on a complex issue, teacher learning and professional development within the context of school-university partnership, the application of a single method is not suitable to get a deeper and better understanding of the research problem.

The quantitative phase was first utilized to investigate teachers' competencies by asking participants' experiences. Furthermore, two groups of teachers (mentor and non-mentors) were compared to explore the impact of SUP on teacher learning and professional development (PD). For further investigation on how teachers developed these competencies during SUP, the qualitative phase was conducted after quantitative analysis. This part answered the questions raised by the quantitative phase. The following sections will explain how the quantitative and qualitative procedures were applied to understand the proposed research problem.

QUANTITATIVE

In order to answer the overall research question "How can the impact of school-university partnership on teacher learning and professional development be understood?" two different research methods were applied. Firstly, a quantitative study was carried out to find out the areas of competencies where teachers showed improvement. This part will be followed by qualitative methods to find out the deeper understanding of the participants. Therefore, to explore which areas of competencies have improved in mentor teachers and the differences in professional development between teachers, the following research questions were developed for the quantitative part of the study.

RQ1: Which professional competencies have been improved by schoolteachers through participating in SUP?

RQ2: Are there any significant differences in teachers' learning and professional development based on their mentoring role?

RQ3:   Are there any significant differences in teachers' learning and professional development based on their intensity level of collaboration with student teachers?

RQ4:   What is the relationship between the intensity of collaboration level and teachers' learning and professional development?

Instrument development and content validity

The researcher developed the instrument for investigating the nature of SUP through analysis of literature review and guidance of the experts. In total, there were 26 questions in the questionnaire. Due to the scope and focus of this study, only three questions that focus on teacher learning and professional development were utilized as the other questions belonged to participants' perceptions of the current status of school-university partnerships in the country. To investigate which areas of teachers' professional skills and competence have been improved, a pool of 17 items was outlined based on literature reading and reviews. These 17 items fell into the categories of three variables: knowledge, skills and attitudes where 8 items from the knowledge component, 7 items from skills and 2 items from attitudes component. The 1-5 Likert from 'did not improve at all' to 'significantly improved' was applied for this question. The questionnaire was pilot tested in 2019 and modified. The questionnaire was developed in English. A think-aloud procedure was applied with two experienced school-teachers of the same background as the researcher for clarity and comprehension to translate it in Myanmar.

Sample and data collection

Participants were 120 teachers who had participated in school-university partnerships ranging from attending professional training/workshops to teachers with mentoring experiences. All 120 schoolteachers responded to the questionnaire. Questionnaires were prepared in Qualtrics and sent out in 2021, January via messenger. Three weeks after sending it out, the survey was closed.

Data Analysis

The quantitative part was statistically analyzed by SPSS using the mean, standard deviation, and frequency. The *t*-test, one-way analysis of variance (ANOVA) and Pearson correlation coefficient were carried out to determine the differences between groups and the relationship between the intensity of collaboration and teachers' learning and professional development.

QUALITATIVE

Followed by the quantitative method, the qualitative part of this study aims to explore a depth understanding of the research problem. To enrich the overall research question mentioned above, the research question for the qualitative part was developed. To understand the participants' opinions, and experiences, the following research question has been outlined: 'how do the participants explain the impact of SUP on their learning and professional development?'.

Participants

A total of four participants were interviewed by the research; specifically, four mentor teachers from basic education schools. Among the participants who volunteered in the interviews, selection took place based on the following criteria: (i) Participants who have school-university collaboration experiences such as participating in PD workshops and training, attending curriculum development training, etc., and (ii) Teachers who have at least 5 years of mentoring experiences. Based on these criteria, participants were selected for the interview process.

Interview protocol

Interview questions and protocol were developed based on the study's quantitative initial findings. Besides this, theoretical considerations and literature reading also supported the development of interview questions.

Data collection and analysis

Interviews were done through video calls due to Covid restriction and they were sent out one week before the interview started. Semi-structured interviews were carried out for all interviews. Each interview took 30–60 min. All interview data were recorded and transcribed and member-checked by asking and showing participants. Themes were developed in the first stage of coding. The codebook was created throughout the coding process and left it open for adding if related codes emerged.

Validity and reliability

To increase validity and reliability, the researcher followed qualitative inquiry methods throughout the study, including triangulation, member checking, and detailed reporting (Creswell, 2012).

Triangulation

As this study investigates the complex issue in teacher education, triangulation was needed to understand the research problem deeply. Furthermore, upon considering that triangulation helps to increase confidence in research findings (Heale, R., & Forbes, D., 2013), triangulation was applied by using both quantitative qualitative approaches in this study.

RESULTS

This section will answer the overall research question of the study: "How can the impact of school-university partnership on teacher learning and professional development be understood?" by combining and merging the results from both quantitative and qualitative parts. As mentioned earlier, four research questions were developed in the quantitative part. These research questions investigate which competencies have developed in mentor teachers, and whether there are significant differences in teachers' learning and professional development based on their mentoring experiences and intensity level of collaboration with student teachers. In addition, quantitative part explores if there is a relationship between collaboration level and teachers' learning and

professional development. On the one hand, the qualitative part of the study investigates how these competencies were developed and how participants explained the impact of school-university partnership on their learning and professional development. Based on quantitative and qualitative findings, this section will be presented three main results: (i) professional development areas, (ii) the impact of SUP on teacher learning and professional development: Mentors Vs Non-mentors and (iii) The impact of SUP on teacher learning and professional development: Communication level.

PROFESSIONAL DEVELOPMENT AREAS

To understand professional competencies developed by teachers, the results of descriptive statistics will be presented followed by the explanation from the qualitative part. Figure 1 reveals the areas of teachers' professional competencies improved by collaboration. Among these competencies, teachers showed high mean values in four areas: 'my feeling of being a responsible person in education, 'my capacity to find enjoyment in teaching', 'my professional self-confidence', 'my efforts to reflect on and analyze my teaching'. However, 'conducting research and application its outcomes' resulted in the least mean value. This result showed that school-university partnership has not yet been effectively implemented for research development in Myanmar. According to these results, participating in SUP supports teachers in developing their professional confidence and efficacy.
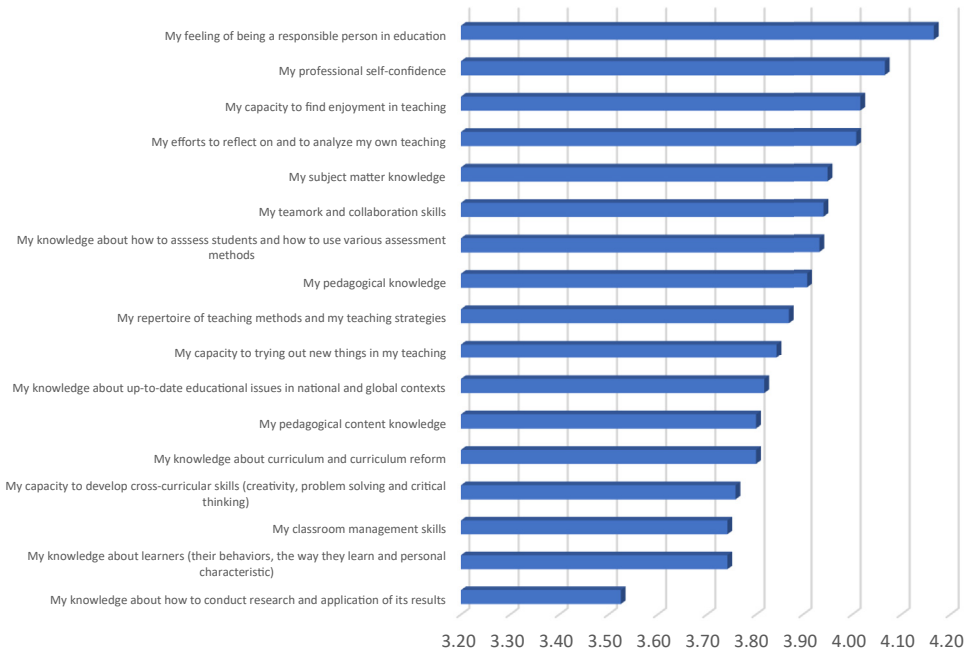

Fig. 1. Teachers' competence areas improved by collaboration ($N = 120$)

The qualitative findings also reflected these competencies development, especially mentor teachers ($n = 4$) reported that they learnt 'pedagogical content knowledge' from student teachers. Although the participants did not explicitly mention about 'feeling of being a responsible person in education and 'my professional self-confidence', the interview responses showed that teachers mentioned how they helped student teachers in their teaching and learning as well as how they discussed with student teachers in relating to teaching strategies. Moreover, they also implicitly reported that their cross-curricular skills and reflection have developed through communicating with student teachers. The details descriptions of these developed competencies by teachers will be discussed later.

The impact of SUP on teacher learning and professional development: Mentors Vs Non-mentors

This section will present the impact of SUP on teachers learning and professional development based on their mentoring role. Both quantitative and qualitative findings reported that teachers who had been mentors improved in their professional knowledge more than teachers who had never been mentors.

To determine whether there are any significant differences in teachers' learning and professional development according to their mentor role, the researcher compared two groups of teachers: teachers with mentoring experiences and teachers without mentoring experiences. Figure 2 compared the mean values of these two groups of teachers. As shown in Fig. 2, teachers who have been mentors showed higher mean values in all skills/competencies than those who have never been mentors.

Table 1 shows the results of the t-test comparing these two groups of teachers. There were significant differences in the two areas of skills or competencies between these groups. One such area is *My pedagogical content knowledge*. Teachers with mentoring experience scored significantly higher here than teachers who have never been in this role. The result suggests that mentoring influences teachers' learning and professional development; teachers who had been mentors improved in their pedagogical content knowledge than those teachers with no mentoring experiences. Similarly, there was also a significant difference between the two groups of teachers in the area: *My knowledge about learners (their behaviours, the way they learn, and personal characteristics)*. Here again, mentor teachers scored significantly higher than teachers with no mentoring experiences. The result suggests that mentoring has an impact on teachers' learning and professional development; teachers who have mentoring experiences learned more about their students' learning characteristics and behaviours than teachers who never have been mentor teachers.

These findings reflected the interview responses of mentor teachers. Based on an interview with a mentor teacher, he claimed that he learned 'pedagogical content knowledge' from student teachers about teaching strategies and methods. According to him, as student teachers came from education colleges, they were trained on how to teach a class by using student-centered approaches and different teaching aids and strategies. However, as he only attended his teacher training for a short time in education colleges several years ago, his knowledge about teaching methods and strategies was not up to date. Therefore, he tried to learn from student teachers as far as he could by conversing with them and observing their teaching.

The most I learned from student teachers was teaching strategies. I was trained at education college for only four months before becoming a teacher. Now, I have no connection with colleges. But for student
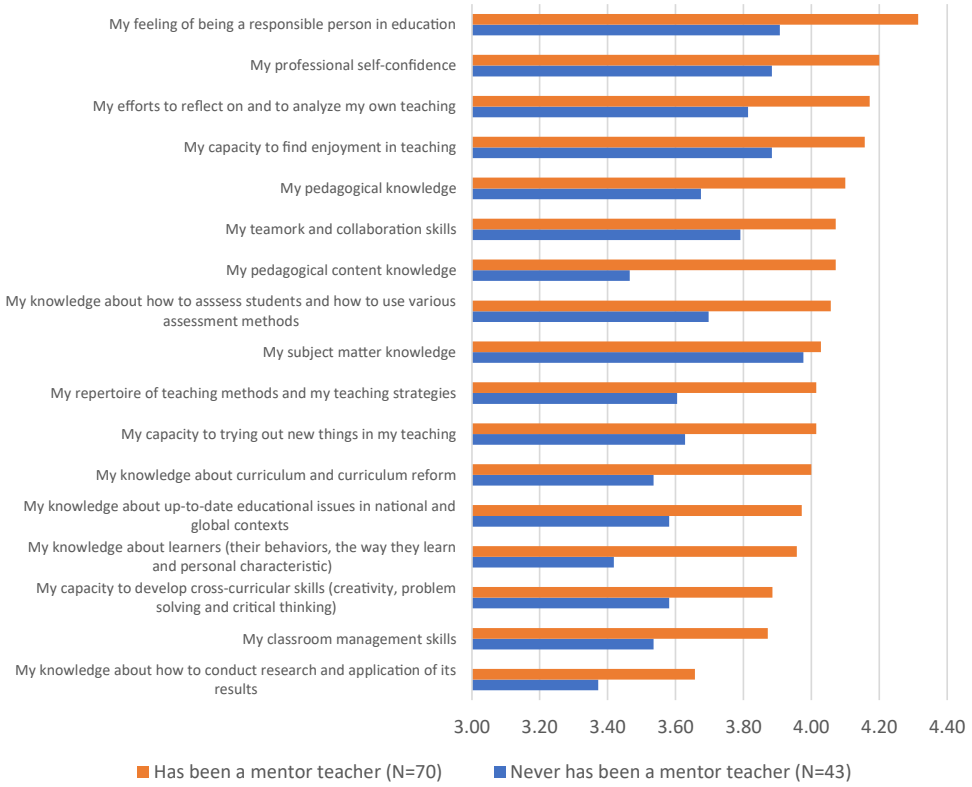
Fig. 2. Comparison of competencies based on teachers' mentoring role

Table 1. Impact of SUP on teachers' learning and professional development

Variables	Non mentor teachers		Mentor teachers		t (111)	P	Cohen's d
	M	SD	M	SD			
My pedagogical content knowledge	3.47	1.24	4.07	1.133	−2.662	0.009	1.200
My knowledge about learners (their behaviors, the way they learn and personal characteristic)	3.42	1.418	3.96	1.148	−2.103	0.039	1.257

teachers, they have been trained for a longer time. I have learned that they plan every lesson by using teaching aids and activities. Pupils are also more interested in lessons with teaching aids and fun activities. The student teachers use different teaching aids and learner-centered methods. That is what I got from them. I want to know more about teaching methods and strategies. As you know, everyone can teach but there are various kinds of teaching methods. To learn from them, I tried to communicate with them a lot through talking to them, asking them and observing their teaching, etc. (Mentor teacher 1)

Interview findings of mentor teachers also reflected the quantitative results about learners' behaviors and characteristics. According to one mentor teacher, schoolteachers sometimes need to suggest student teachers understand learners' behaviours. When a teacher was a class teacher of the children whom student teachers did practice teaching, she knew very well about her students. Whenever student teachers had difficulties handling students' behaviors, school-teachers had to teach them about classroom management and handling student issues. This makes schoolteachers pay more attention to their pupils and observe more about their children when student teachers are teaching the class. Therefore, they had to be aware and observe how their children behave and how they learn when student teachers do practice teaching.

> *Sometimes, student teachers don't know the nature of the children. At that time, I have to describe and tell them the nature and behaviors of some students in my class. I know these children's behaviors because I am their class teacher. So, I told student teachers how to handle these students, etc. But we don't need to go to the classroom and control the class. They manage by themselves. (Mentor teacher 3)*

> *There is one very stubborn child in my class. He used to be bossy to his friends. He never listens to any teachers and never follows the rules, and he is quite naughty. I have to think about the ways how to handle this child. Finally, I appointed him as the head student of the class. Then, from that time, he became one of the cleverest students in my class. These kids, want teachers' attention to take care them. This is one example I gave to student-teacher. (Mentor teacher 4)*

According to these interview responses, it can be seen that mentor teachers improved their competencies in pedagogical content and in learners and their characteristics. Both interview findings and quantitative findings showed that the collaboration with student teachers as their mentors did have an impact on teachers learning and professional development.

The impact of SUP on teacher learning and professional development: communication level

Besides investigating teachers' professional development based on a mentoring role, I explored the impact of SUP on mentors' professional development according to the level of communication with student teachers. First, I ran an ANOVA calculation which compared three groups of teachers based on their communication level with student teachers (STs). In the questionnaire survey, the teacher groups were divided into four levels of communication: 'no communication at all with STs', 'good communication with STs but never discuss teaching and learning, 'good communication and sometimes discuss teaching and learning and 'very close communication: discuss teaching and learning, plan lessons together with STs'. However, there were no teachers who answered 'no communication with STs'. Therefore, only three groups were compared. Figure 3 compared mean values of teachers' competencies improvement between three groups. According to Fig. 3, teachers with very intensive communication with STs possess higher mean values than those with less intensive communication.

Tables 2 and 3 shows the results of the ANOVA Post Hoc test between three groups of teachers defined by communication level with student teachers. ANOVA showed the significant differences between the groups; therefore, ANOVA post-hoc test was calculated to find out the differences between groups. According to the results, there were significant differences in the areas of *pedagogical content knowledge, knowledge about learners and behaviors, my repertoire of teaching methods and teaching strategies, knowledge about assessment strategies and teachers'*
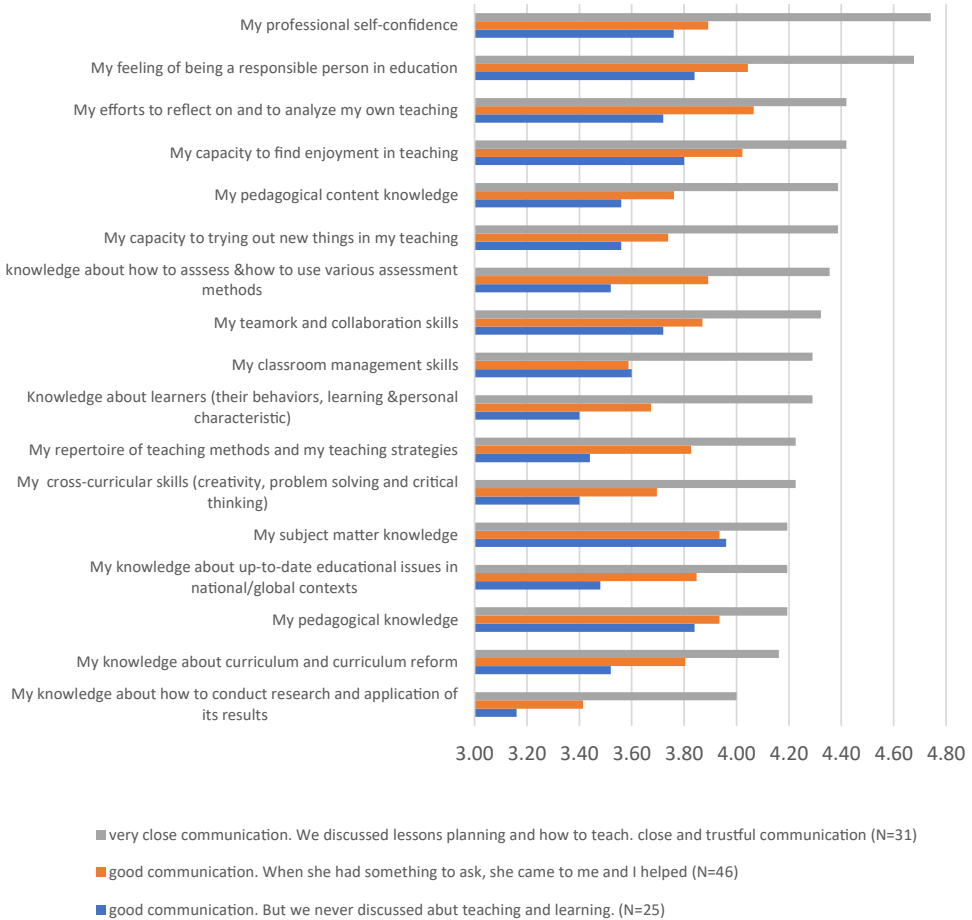
Fig. 3. Comparison of mean values on teachers' skills and competences based on teachers' communication level with student teachers

confidence' between two groups: 'very close/intensive communication: plan and discuss teaching and learning with STs' and 'good communication but never discussed teaching and learning. Similarly, the '*classroom management skills*' area and '*pedagogical content knowledge*' area showed significant differences between two groups of teachers: 'very intensive communication: discuss and plan lessons together' and 'good communication: sometimes discuss teaching and learning'.

After comparing teachers' professional development according to the communication level with student teachers, it was important to figure out whether there is a relationship between the intensity of collaboration level and teachers' learning and professional development. Therefore, a correlation coefficient was calculated. According to Table 4, the results showed that there were positive relationships between teachers' communication level with student teachers and teachers' competencies improvement areas. As more intensive communication

Table 2. Impact of SUP on teachers' learning and skills development based on communication level with student teachers

Variables	Good communication. Never discussed.		Very close and trustful communication.		F (2.99)	η^2
	M	*SD*	*M*	*SD*		
My pedagogical content knowledge	3.56	1.083	4.39	0.989	4.379*	0.081
My knowledge about learners (their behaviors, the way they learn and personal characteristic)	3.40	1.190	4.29	0.673	4.483*	0.083
My classroom management skills	3.60	1.323	4.29	1.101	3.398*	0.064
My repertoire of teaching methods and teaching strategies	3.44	1.158	4.23	1.146	3.128*	0.059
My knowledge about how to assess students and how to use various assessment methods	3.52	1.531	4.35	1.112	3.346*	0.063
My capacity to develop cross-curricular skills (creativity, problem solving and critical thinking)	3.40	1.291	4.23	0.956	3.810*	0.071
My capacity to trying out new things in my teaching	3.56	1.158	4.39	0.989	4.548*	0.084
My professional self-confidence	3.76	1.268	4.74	0.773	6.566**	0.117
My feeling of being a responsible person in education	3.84	1.434	4.68	0.791	4.412*	0.082
My effort to reflect on and to analyze my own teaching	3.72	1.173	4.42	0.886	3.140*	0.060

***$P < 0.001$, **$P < 0.01$, *$P < 0.05$.

goes, more improvements in these learning areas follow. For example, according to Table 4, when teachers have more intensive or close communication with student teachers (discuss and plan lessons together for teaching), teachers' teamwork and collaboration skills as well as confidence level increases.

The qualitative findings also reflected the quantitative findings. As discussed earlier, mentor teachers learnt 'pedagogical content knowledge' and 'knowledge about learners' behaviours and characteristics' through discussion and communication with student teachers. One of the mentor teachers explicitly said that he tried to collaborate with student teachers as he wanted to know more about teaching activities and teaching aids used by student teachers. He mentioned that:

Table 3. Impact of SUP on teachers' learning and skills development based on communication level with student teachers

Variables	Good communication. When she had something to ask, she came to me, and I helped.		Very close and trustful communication.		F (2.99)	η^2
	M	SD	M	SD		
My pedagogical content knowledge	3.76	1.233	4.39	0.989	4.379[*]	0.081
My capacity to trying out new things in my teaching	3.74	1.182	4.39	0.989	4.548[*]	0.084
My professional self-confidence	3.89	1.303	4.74	0.773	6.566[**]	0.117
My feeling of being a responsible person in education	4.04	1.154	4.68	0.791	4.412[*]	0.082

[***]$P < 0.001$, [**]$P < 0.01$, [*]$P < 0.05$.

> I usually tried to be friendly with student teachers. This is because we have different experiences and knowledge that we can learn from each other. As for me, I wanted to know about teaching aids and teaching strategies they used. So, I tried to communicate with them intensively.

This quote showed that teachers were aware of their limited pedagogical content knowledge. Therefore, they tried to communicate with student teachers to learn from them. In other words, the intensive communication with student teachers might influence teachers' professional development in pedagogical content knowledge.

In relating to cross-curricular skills and reflection on their practices, teachers said they got a chance to reflect on their practices and teaching and to figure out new teaching methods while working with student teachers. The questions from student teachers encouraged them to learn and create different teaching strategies.

> *Sometimes student teacher came and asked me when she could not figure out how to teach specific topics in English and Mathematics. For example, she asked me how to teach pupils to understand 'arithmetic' in Math. Because teachers' handbook says to teach it in some teaching methods, but sometimes, some students can't follow those methods. So, we must come up with ideas, and try to find new teaching methods and strategies to make every pupil understand. Sometimes, it is challenging, but I learned a lot from it. (Mentor teacher 2)*

As we have seen a significant difference in teachers' cross-curricular skills in ANOVA test and a positive correlation, the above interview quote of mentor teachers reported that teachers were developing cross-curricular skills while collaborating with student teachers.

Through mentoring activities, teachers also showed an increase in self-confidence and enjoyed teaching more and showed that they felt that they were the responsible person in

Table 4. Correlation table between the intensity of communication level and teachers' competencies improvement areas

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Communication level with STs	1														
2. Pedagogical content knowledge	0.270**	1													
3. Learners (their behaviors, the way they learn and personal characteristic)	0.279**	0.620**	1												
4. Classroom management skills	0.211*	0.576**	0.553**	1											
5. Teaching methods and my teaching strategies	0.244*	0.627**	0.640**	0.568**	1										
6. Various assessment methods	0.251*	0.496**	0.547**	0.556**	0.584**	1									
7. Cross-curricular skills (creativity, problem solving and critical thinking)	0.263**	0.653**	0.671**	0.565**	0.646**	0.649**	1								
8. Capacity to trying out new things in my teaching	0.272**	0.649**	0.655**	0.563**	0.615**	0.524**	0.694**	1							
9. Teamwork and collaboration skills	0.197*	0.630**	0.591**	0.511**	0.539**	0.655**	0.673**	0.650**	1						
10. Curriculum and curriculum reform	0.190	0.592**	0.612**	0.464**	0.566**	0.501**	0.666**	0.604**	0.687**	1					
11. Up-to-date educational issues in national and global contexts	0.217*	0.616**	0.521**	0.480**	0.578**	0.398**	0.554**	0.525**	0.580**	0.583**	1				
12. Conducting research and application of its results	0.236*	0.538**	0.547**	0.526**	0.584**	0.452**	0.679**	0.580**	0.628**	0.560**	0.518**	1			
13. My professional self-confidence	0.309**	0.505**	0.609**	0.515**	0.600**	0.522**	0.645**	0.610**	0.563**	0.526**	0.582**	0.476**	1		
14. My capacity to find enjoyment in teaching	0.215*	0.562**	0.577**	0.464**	0.506**	0.427**	0.681**	0.603**	0.504**	0.666**	0.496**	0.474**	0.640**	1	
15. My feeling of being a responsible person in education	0.271**	0.552**	0.505**	0.485**	0.590**	0.501**	0.547**	0.569**	0.586**	0.584**	0.577**	0.420**	0.683**	0.643**	1
16. My efforts to reflect on and to analyze my own teaching	0.244*	0.606**	0.614**	0.534**	0.582**	0.555**	0.666**	0.683**	0.671**	0.668**	0.622**	0.475**	0.690**	0.725**	0.735**

$^{***}P < 0.001$, $^{**}P < 0.01$, $^{*}P < 0.05$, $N = 102$.

education. These feelings of motivation and high self-confidence came from collaboration and communication with student teachers. According to the correlation results, there was a positive relationship between teachers' communication level with student teachers and their self-confidence and enjoyment of teaching. This can also be seen in interview responses. For example, one of the mentor teachers said that he was very satisfied and motivated when student teachers showed interest in research he had done for his master's degree.

> *I told them about the research I did at the university for my master's degree. They are interested in it because they have no experience of conducting research at their college. And I told them that in education, we also need to do research…because it is important. Then we discuss what needs to be changed in education and what kinds of research are interesting to conduct, etc. I am happy that they are interested in it. (Mentor teacher 3)*

Another reason mentor teachers felt motivated in teaching and increased their confidence level was when student teachers asked them about the subject matter knowledge and classroom management.

> *Now, we have a new curriculum. We, teachers, were trained by curriculum developers to teach these new curricula. But student-teachers have no training. So, sometimes, they are afraid to teach the new curriculum. I have to guide them, sometimes. I had to recall my learning from those training and share those training with them. They (student teachers) are smart, we don't need to teach too much. They need only a little support from us, then they will handle the rest. (Mentor teacher 2)*

Moreover, mentor teacher also mentioned that they became motivated when student teachers came to their school for practice teaching as they are active and energetic.

> *"Well, they (student teachers) give me energy and motivation. As they are young and active and speedy in doing things, we like seeing them." (Mentor teacher 3)*

According to this, mentor teachers are more motivated and energetic by working and collaborating with student teachers in their school. It can also be assumed that mentoring can increase teachers' enjoyment in their teaching and learning at schools.

DISCUSSION

The study answers the research question: "How can the impact of school-university partnership on teacher learning and professional development be understood?" In order to answer this research question, this section will present the integration of quantitative findings and qualitative results through reviewing the literature on SUP and mentoring in teacher education.

According to literature, school-university partnerships support teachers' professional learning (Allen, J. M., Howells, K., & Radford, R., 2013: Darling-Hammond, 2006). In this study, mentor teachers' learning, and professional development has shown improvement through engaging in school-university partnership. Collaboration and communication are the essential learning skills for all professions. Learning can occur within an individual through reflection and analysis. However, to disseminate the accumulated learning or knowledge, we need collaboration and communication. School-university partnership has shown to support the professional development of teachers in several studies through school network projects for research development, and for school improvement (McLaughlin, C., 2006; McLaughlin, C. & Black-

Hawkins, K., 2004). Moreover, school-university partnership can be used as a tool for professional development of teachers in national new curriculum development. A recent study by the author showed that the use of SUP as a tool in the professional development of teachers (Thant Sin, 2021).

This study showed the learning and professional of teachers through participating in a school-university partnership by focusing on mentor-mentee relationship: how mentor teachers learn through engaging in school-university partnership. In this study, the comparison between mentors and non-mentors showed that there were differences in mean values in the competency's areas of 'feeling as a responsible person', 'increase in professional self-confidence' and 'capacity to find enjoyment in teaching'. These areas are also mentioned by mentor teachers in the qualitative part as well. This development in self-efficacy related competencies reflected what Yost (2002) mentioned in his research work: 'mentoring as a professional development tool have a direct effect on teacher efficacy'. This also means that engaging as mentor teachers can indirectly enhance teachers' self-efficacy. Moreover, Richter et al. (2013) investigated the impact of mentoring on beginner teachers' professional development. According to them, mentoring is a crucial source of support for student teachers in increasing "teacher enthusiasm" which shows higher levels of efficacy, teaching enthusiasm, job satisfaction and lower levels of emotional exhaustion in their profession. This study does not investigate how mentoring impacts on student teachers; however, it explores how SUP can enhance teachers' learning through mentoring activities. This study showed that mentor teachers described 'degree of enjoyment, excitement and pleasure in their professional activities' through collaboration with student teachers within the context of school-university partnership.

On the other hand, the findings of this article can be discussed from the perspective of two related terms to understanding teachers' learning within the context of SUP how teachers 'share' their knowledge and how they proceed to their 'learning' and build professional development. First of all, according to the quantitative part, we have seen that teachers developed mostly in skill areas called 'pedagogical content knowledge'. According to teachers' interviews, they all had communication with student teachers guiding for their teaching and answering the questions. In parallel with sharing their knowledge with student teachers, they also noticed that student teachers had some abilities that they could learn from them. For example, one mentor teacher said:

> 'I communicate with them, and I want to learn from them. They know more teaching strategies and methods that I don't know. So, I want to learn these teaching methods, activities from them.'

Mentoring is mostly about training for pre-service teachers and mentors usually share and teach their mentees about pedagogical knowledge. Research papers on mentoring showed that student teachers had improved their pedagogical content knowledge through communication and collaboration with mentor teachers (Barnett & Friedrichsen, 2015; See, 2014; Van Driel, Jong, & Verloop, 2002). However, in this study, the learning of schoolteachers is unique. They learnt from student teachers about new teaching methods and strategies as student teachers came from colleges and had been learning teaching methods and strategies in their colleges. From this point of view, we can see the attitudes of schoolteachers and their eagerness to learn and develop their professional knowledge. Therefore, in addition to teacher learning, trainings for schoolteachers for up-to-date educational teaching strategies and knowledge should be provided in the future.

Another possible improvement area that might have shown in mentor teachers is the increase in teacher efficacy. Studies on mentoring and teacher efficacy also proved that mentoring and efficacy are related (Epstein & Willhite, 2015; Yost, 2002). According to the findings, teachers mentioned that they had enjoyed their profession more than before mentoring role and their confidence level also increased. This can be assumed that teacher efficacy might have developed in those teachers. Based on the research results, another thing that might probably draw the interpretation is that the collaboration between schools and universities in initial teacher training somehow helps mentor teachers to increase competencies in their profession.

Hargreaves and Fullan (2000) described four stages of the changing nature of teachers' professionalism: (i) the pre-professional age, (b) the age of the autonomous professional, (c) the age of the collegial professional, and (d) the fourth professional age. Through investigating the research results of this study, a higher level of teachers' professionalism called "the age of collegial professional" has been discovered. The collegial professional age is the essence of school-university partnership in literature where both partners learn from each other through collaboration. Although, SUP in this study is about the 'mentor trains mentee' context, mutual learning and knowledge sharing occurred during their communication. Hargreaves and Fullan mentioned that 'collegial professionalism means working with learning from and teaching colleagues'. When teachers learnt new teaching strategies and teaching aids from student teachers, this significantly tells the collegial professional what is happening within the context of school-university partnership.

CONCLUSION

This study investigates how mentor teachers learn through engaging in a school-university partnership., This study confirms that engaging in school-university partnership in initial teacher education not only enhances student teachers in their professional development but also supports mentors to develop their self-confidence, and enjoyment in teaching. Moreover, professional knowledge about teaching and learning also significantly improved in mentor teachers than in non-mentor teachers. Anther hidden and not explicit area of development might be an improvement in teachers' efficacy as mentors showed self-confidence, enjoyment in their profession and motivation in teaching. This study would like to suggest that further studies should investigate how mentors can improve their efficacy by participating in school-university partnerships in teacher education.

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ABOUT THE AUTHOR

Khin Khin Thant Sin is a PhD candidate from the Doctoral School of Education, Faculty of Education and Psychology, Eötvös Loránd University. She is also a teacher educator from

Yangon University of Education in Myanmar. Her doctoral research is school-university partnership in teacher education. Her research interests are school-university collaboration and networking, teacher education, teacher collaboration and teacher learning, teacher professional development, higher education studies and teachers' knowledge creation and management. She has participated in EDiTE SUP project in 2019 which was funded by the European Union's Horizon 2020 research and innovation programme. She has contributed her works to the EDiTE SUP project and its publication about 'school-university partnership for international doctorate program on teacher education' in 2020.

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