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Teacher Participation in Online Collaborative Learning: Does it Improve their Teaching Competency?

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Keywords

online collaborative learning, professional development, teachers'competency, teacher participation

Abstract

The Covid-19 pandemic has caused a rapid transformation of Teacher Professional Education (TPE) in Indonesia from face-to-face to online. Although the programme is run online, learning activities, namely collaborative learning among programme participants, practitioners, and experts, are increasingly being encouraged. This study attempts to explore online collaborative learning (OCL) from the perspective of teachers participating in TPE. This study uses a qualitative approach with a qualitative e-research framework design, and the respondents were twenty in-service teachers. Data was collected through structured interviews, observation, and related documentation studies. The results suggest that by using various technological devices, programme participants collaborate in designing, implementing, evaluating, and reflecting on innovative learning while participating in the TPE. The contributions are an increase in their problem-solving competence, teaching competence, and information and communication technology competence. Based on the results, several recommendations have been provided for TPE providers, programme designers, and future researchers.

Introduction

Designing teacher professional development programmes that bring positive changes in teaching practices is the main strategy for improving teacher competence and performance, so that programme design becomes the main tool used by every country to improve the teaching skills of their teachers (Popova et al., 2022; Yusrina et al., 2022). In the Indonesian context, one of the efforts to form and develop teacher professionals is through a teacher certification programme (Rusilowati & Wahyudi, 2020). To obtain certification, each teacher must go through a teacher professional education (TPE) programme within a certain period (Directorate General of Teachers, 2020, 2021). Initially, this programme was completed through a portfolio, then it changed to a teacher education and training programme (conducted face-to-face), and finally turned into a TPE using a hybrid model in 2018, and since the Covid-19 pandemic in 2020 has used online learning (Loeneto et al., 2022; Samani, 2021).

Various studies have confirmed that in an effective teacher professional development programme, it is necessary to place the participating teachers as adult learners (Ajani, 2019; O'Dowd & Dooly, 2022). Thus, programme activities should contain adult learning activities that facilitate the broadest possible ways for teachers to share knowledge, learn from one another, and be responsible for the growth and development of the quality of their learning process through fundamental changes in their teaching practice to be employed after attending the programme (Harris & Jones, 2019). Other studies confirm that online learning will be

effective if it is delivered through various interaction and collaboration activities and will benefit students by improving learning outcomes and social aspects such as social presence (Altowairiki, 2021; García-Martínez et al., 2022; Strauß & Rummel, 2020).

Previous researchers have conducted studies in TPE in Indonesia. For example, research on supporting and inhibiting factors in the implementation of in-service TPE has been carried out online (Darta & Saputra, 2022; Kurniawan, 2020; Lailatussaadah et al., 2020; Mariati, 2020), including studies on the analysis of comprehensive test results (Baharuddin et al., 2021). However, the existing research has not explored learning activities, especially in online collaborative learning (OCL) in TPE. For this reason, this research seeks to explore aspects of learning activities that occur in TPE in Indonesia from the perspective of teachers participating, especially in OCL.

Research Questions

This research sought to answer the following research questions:

i) What facilities do teachers use in OCL?
ii) What activities are carried out by teachers while participating in OCL?
iii) What is the contribution of OCL in strengthening teacher competency improvement?

Literature Review

The online teacher-learning community has become a popular and dynamic research topic, so it gradually fosters new views in the professional development of teachers with associative, constructivist, reflective, collaborative, and connectivity characteristics (Marín et al., 2018; Sancar et al., 2021). Web 2.0 offers a participatory environment that supports communication, active and collaborative learning, independent and lifelong learning, reflection, self-assessment, and peer interactions through asynchronous and synchronous discussion forums and has been widely used to support online teacher communities (Tsiotakis & Jimoyiannis, 2016). The researchers further emphasised that online course development's learning community aims to increase interaction between students and instructors and promotes active and collaborative knowledge construction.

Many studies on collaborative learning (including in online learning environments) are based on the theory of social constructivism developed by Vygotsky (1978), which asserts that knowledge is socially constructed (Alismaiel et al., 2022; Archambault et al., 2022). Every individual who experiences the learning process needs to interact with others, who are more capable, through social interaction and collaboration (Radović et al., 2023). Based on this assertion, online learning will be effective if it is achieved through interaction and collaboration, which are more than just ordinary learning activities but comprehensive learning activities that encourage the building of sustainable knowledge (Altowairiki, 2021). This also occurs in the learning process of teachers to improve their competence and professionalism as teachers. Research on online collaboration projects with teachers shows that collaboration with fellow teachers helps them to develop communication and collaboration skills and increases self-confidence (Hur et al., 2020). Other findings indicate increased technology skills and self-efficacy for technology integration and high levels of collaborative work satisfaction. OCL has the potential to reduce learner isolation, help collaborating participants gain more profound levels of constructing knowledge, and achieve the desired outcomes. This can be done by giving and receiving support (emotional and cognitive), discussing ideas, making agreements, listening

to opinions, exchanging information and points of view, and comparing alternative ideas, interpretations, and representations (Altowairiki, 2021).

The TPE in Indonesia is aimed at in-service teachers to overcome the problem of incompetent and underqualified teachers (Directorate General of Teachers, 2020, 2021). They have received teacher education at several teacher training colleges in Indonesia and have served as teachers for several years, but they do not yet have an educator certificate. In-service TPE in Indonesia is expected to improve specific abilities, including carrying out innovative and enjoyable learning, integrating critical thinking and problem-solving, communication and collaborative skills, creativity and innovative skills, information and communication technology literacy, contextual learning skills, and information and media literacy (Directorate General of Teachers, 2020, 2021).

While carrying out the programme, participants are facilitated and conditioned to collaborate in their respective groups to give each other input on their learning reflections, find various practical problems in teaching that urgently need solutions, discuss various alternative solutions, and determine relevant solutions, together designing improvements and innovations in learning, and designing their implementation in field experience practices, and then reflecting again. At the end of the programme, they collaborate to compile a learning best practice and prepare for performance tests. They must do this at the end of a series of courses while participating in TPE because each participant is required to take part in field experience to practice their abilities in teaching (Directorate General of Teachers, 2020, 2021).

Methods

Design

This research uses a qualitative approach with a qualitative e-research framework adopted from Salmons (2022). This framework is used because this research examines cases in online learning activity and conducting research using data collected online. Qualitative electronic research is a general term that describes the methodological tradition of using Information and Communication Technology (including online and social media) to study perceptions, experiences or behaviours through participants' verbal or visual expressions, and actions or writing (Salmons, 2016). The suggested steps followed in this study were as follows: 1) aligning purpose and design, 2) taking a position as a researcher, 3) selecting extant, elicited or enacted methods, 4) selecting ICT and milieu, 5) handling sampling and recruiting, 6) addressing ethical issues, 7) collecting the data, 8) analysing the data and reporting (Salmons, 2022).

Research Participants

Twenty (20) elementary school teachers participated in this research; they were participants in the 2022 in-service TPE, providing time to be interviewed in-depth online and were willing to be observed during the collaborative learning process with fellow programme participants, practitioners (expert/senior teachers), and experts (teacher educators). This research used a purposive sampling technique because it examined the collaboration in teacher learning when participating in the TPE. Hence, teachers who were programme participants willing to be interviewed, and showing activity in learning and collaborating during the programme, were suitable as research participants. They served in several cities in Indonesia, such as Deli Serdang (North Sumatra), several cities in South Sulawesi (Makassar, Parepare, Luwu, Enrekang, Sinjai, Jeneponto, Pangkep, Sopeng, and Toraja), and Nabire (Papua). Research participants were representatives of Indonesia's western and eastern regions. Their average age was 36 years, the

youngest being 27, and the oldest 45. Their teaching experience averaged 11 years, with a minimum of 7 years and a maximum of 18 years.

Data Collection and Analysis

Qualitative data collection methods are typically differentiated into three broad types: interviews, observation and document or archival analysis (Salmons, 2022). In this research, data were collected by observing collaborative learning activities synchronously and asynchronously, observing the digital footprint of collaboration on the learning management system (LMS), and conducting online structured interviews. Naturalistic inquiry (Lincoln & Guba, 1985) was used to analyse research data. Thus, each respondent could speak or express themselves widely and freely about their learning experiences through OCL while attending TPE. Data analysis uses thematic analysis by coding and analysing relevant data and enabling researchers to identify, analyse, and interpret patterns of meaning to answer research questions (Creswell, 2018). Based on the analysis of the results, it was found that several themes repeatedly appeared so they were considered general, then they were grouped into finding themes. The data validity process refers to several validity strategies (Creswell, 2018), such as the triangulation method, regarding the respondents and the data collection type. Data from interviews, activity observation data, and document (digital trace) data were used to cross-check and complement each other.

Ethical Clearance

All participants agreed to participate in this study on the condition that they remain anonymous. Referring to the qualitative e-research framework (Salmons, 2022), ethical issues are essential research stages. In this case, the researcher secured permission to access the online profiles of all research participants, observed their online posts and interactions to examine existing data, and ensured they verified consent to participate voluntarily.

Findings

This research was conducted by directly observing the TPE process carried out by the Indonesian government through the programme organisers for three months. Learning activities carried out online were carefully observed, with a focus on online collaborative learning (OCL) activities among programme participants, practitioners, and experts. In-depth interviews were conducted with twenty programme participants with the same focus. The results can be sorted into the following three types of research findings.

Facilities Used by Teachers in Participating in OCL

First, data about facilities used by teachers in participating in OCL was obtained from interviews, observation and documentation. The codes and themes found are summarised in Figure 1.

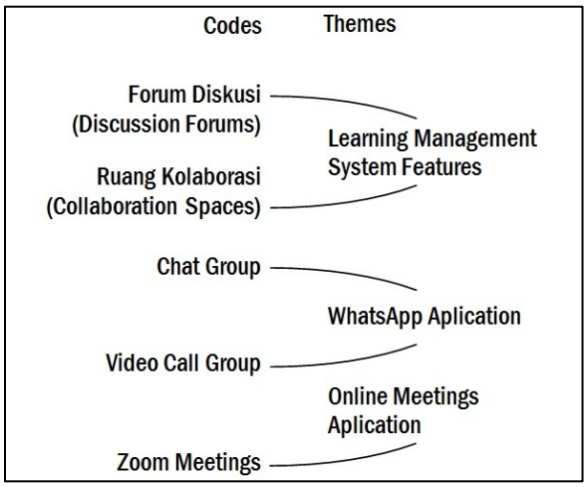

Figure 1: Data coding facilities used by teachers participating in OCL

Observation results show that the TPE participants actively collaborated online through the LMS. They were specifically facilitated to collaborate in the LMS through the Forum Diskusi (discussion forums) and Ruang Kolaborasi (collaboration spaces) feature (see documentation data in Figure 2). The programme participants also joined social media groups, especially WhatsApp, in small groups (consisting of 10-12 teachers) and large groups (consisting of 33-36 teachers). They also joined other WhatsApp groups with practitioners and experts. In this way, at least, they actively discussed and collaborated to learn from each other through two groups with fellow participants and one group with practitioners and experts. Observation results also show that TPE participants were facilitated to carry out discussions and collaboration via Zoom meetings for one to three hours every day during the three months of the programme (see documentation data in Figure 4).

This observation data was reinforced by interview data. Following are some examples of the results of these interviews. One respondent explained,

> We always discuss many things about our problems and learning actions with practitioners and expert guides through Forum Diskusi (discussion forums) and Ruang Kolaborasi (collaboration spaces) at the LMS. However, it is more intensive in the small WhatsApp groups (R17).

Another respondent commented in more detail,

> Sometimes, we use WhatsApp chat groups for small classes or large classes. Sometimes, we also use WhatsApp video calls for discussions with small groups. However, what is more common is the LMS feature. What is certain is that we all use Zoom Meetings for discussions and collaboration with fellow participants, teacher educators and experts to design innovative learning (R20).

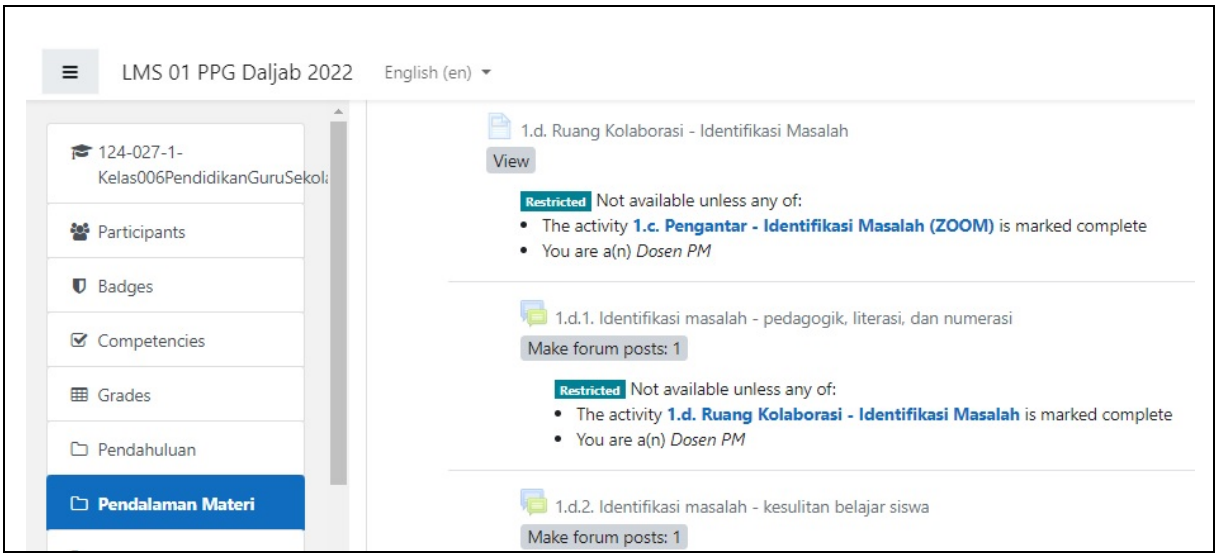

Figure 2: Example of facilitation of OCL in LMS

Activities Carried Out by Teachers While Participating in OCL

Second, data about this was obtained by observing various participant activities, interviews and documentation. The codes and themes found have been summarised in Figure 3.

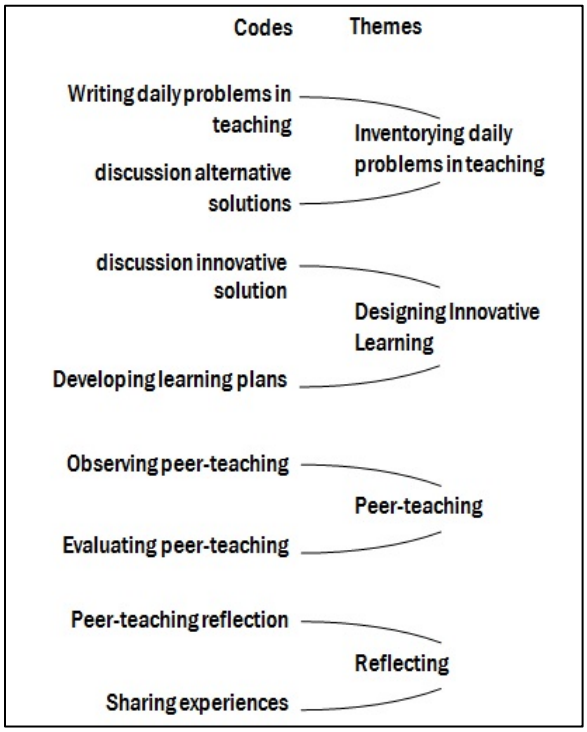

Figure 3: Data coding participant activities

Observation results showed that in the initial stage, programme participants discussed and collaborated on daily problems in teaching. They wrote about this in the Forum Diskusi

(discussion forums) and Ruang Kolaborasi (collaboration spaces) in the LMS (see documentation data in Figure 6). They shared comments and experiences about their daily problems in teaching. Observation results also showed that they intensively did the same thing in WhatsApp groups. In this activity, practitioners and experts then directed participants to take an inventory of various daily teaching problems of TPE participants. The inventory results were then brought to the Zoom meetings forum for discussion, and alternative solutions were sought through a literature review. The results converged on one solution for each problem. Observations on Zoom meetings activities show that participants, practitioners, and experts then designed and developed innovative learning designs to overcome the problems they had inventoried (see documentation data in Figure 4).

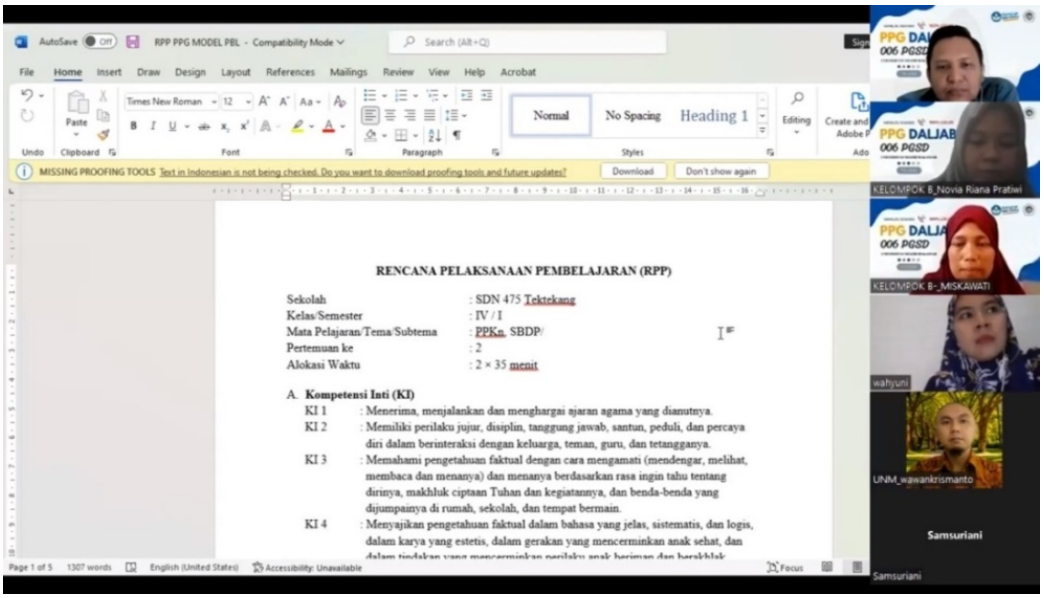

Figure 4: Examples of collaborative activities to develop learning plan through Zoom meetings

The next activity involved participants, practitioners, and experts designing and carrying out implementation activities in a teaching practice. One of the participants carried out a teaching practice in class, while the other participants, practitioners, and experts were observers. After the practical activities were completed, they all returned to Zoom meetings to conduct evaluation activities and reflect on the results of their teaching practices. They gave each other constructive criticism and suggestions for improving teaching practices in the next cycle. Observation results showed that at the end of the peer-teaching activity, each participant wrote about their reflections and follow-up in a best practice paper. The content involved sharing stories of experiences in designing and implementing innovative learning to solve everyday teaching problems faced by teachers. Thus, activity observations showed that they collaborated in designing, implementing, evaluating, and reflecting on innovative learning while participating in the TPE.

The observation data described in the previous paragraph was confirmed with interview data. One respondent explained,

> It is essential to collaborate with fellow teachers participating in TPE. We exchange ideas, give each other input, provide ideas or information about solutions to learning problems, encourage each other, give each other information related to TPE, and occasionally joke with each other to lighten the mood (R9).

Another respondent confirmed,

> We respond to each other's presentation results and give each other advice on many things. They range from learning problems in each class, ideas for solutions, development of learning tools, and implementation of learning actions until the moment of reflection on the results of the learning action (R11).

The Contribution of OCL in Strengthening the Improvement of Teacher Competence

Third, data about this was obtained by observing various participant activities while participating in the TPE, interviews and documentation. The codes and themes found have been summarised in Figure 5. During discussions and collaboration, TPE participants gained new knowledge and experience regarding daily learning problems from other participants, practitioners and experts. Then, they gained new insights through alternative approaches to overcome them, either through new and innovative strategies, methods, learning models, or technology-based innovative learning media.

The observation data described was strengthened by data from interviews. One of the respondents explained,

> During the TPE, I had much impact, especially on innovative learning designs and teaching competencies. Apart from that, I also have a frame work in finding solutions to problems, especially learning problems, such as getting used to reflection, reading literature, discussions with colleagues and experts, and a willingness to try new things to overcome problems in teaching in my class (R9).

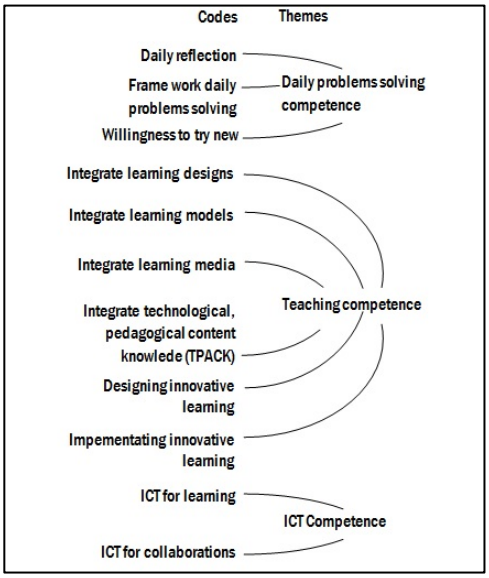

Figure 5: Data coding the contribution of OCL

Another respondent also exemplified,

> The positive impact that I get by collaborating with fellow participants, teacher educators, and senior teachers is an increase in my potential in solving problems in class. Such as the ability to design, create and use learning media, integrate TPACK, and compile student worksheets according to the learning model applied (R8).

Finally, another respondent indicated an increase in integrating ICT into their learning,

> While participating in the programme, I was required to use gadgets to continue to interact and collaborate in the context of learning with fellow participants, practitioners, and experts. This is very important, especially for me, who is very behind on the progress of ICT in learning (R7).

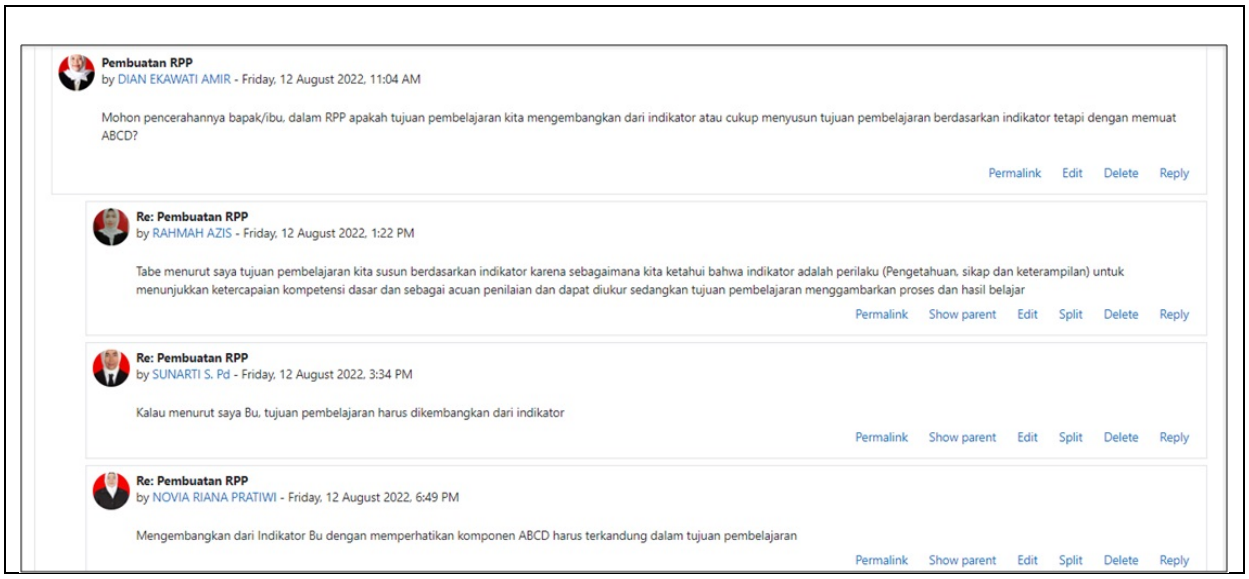

Figure 6: Examples of interaction and discussion activities in LMS

Discussion

Facilities Used by Teachers in Participating in OCL

Observational data, reinforced by interview and documentation data, shows that LMS, WhatsApp and Zoom meetings are the media most intensively used by TPE participants to discuss and collaborate (see Figure 1). The facilities provided by TPEs, held online through LMS and social media. provided opportunities for teachers to build their knowledge, experience, and competencies through OCL. This is in line with several previous studies (Lam, 2015; Liu, 2020; Tasnim Wan Hussin et al., 2019). They collaborated widely with fellow teachers and practitioners and experts. Online activities, both synchronous and asynchronous, in the form of collaboration forums, discussion forums, strengthening forums, and reflection forums, are practical suggestions for OCL. Advances in web-based learning environments enable and reinforce teacher-learning interactions and critical reflection on collaborative and learning practices. Web 2.0 offers a participatory environment that supports communication, active and collaborative learning, independent and lifelong learning, reflection, and self-assessment, and peer interaction through asynchronous and synchronous discussion forums and has been widely used to support online teacher communities (Tsiotakis & Jimoyiannis, 2016). LMS facilities

provided by professional education programme providers support teachers being connected, even though they are geographically far apart. Several studies show that LMS standards have supported the realisation of an inclusive learning environment for academic progress, one of which is through features that promote online collaboration, discussion, and communication among other LMS users (Bradley, 2020).

Likewise, the WhatsApp group was used by participants, practitioners, and experts, strengthening interaction in collaboration during the programme. Various studies show that class WhatsApp groups strengthen the realisation of OCL among teachers and have the potential to be a means of overcoming and solving problems and misunderstandings on various matters such as curriculum and assessment, as well as being a means of monitoring and support during teacher professional development programmes (Motteram et al., 2020; Udenze & Oshionebo, 2020). In the context of the use of technology by teachers, teacher collaboration is essential when dealing with innovative activities, such as introducing technology into teaching as carried out by participants in online TPE in Indonesia. A study by O'Dowd and Dooly (2022) shows that teachers who show a willingness to develop contact with fellow teachers and with experts through the use of collaborative online facilitation tend to use technology creatively for the benefit of learning and teaching, the impact of which is to stimulate them to use innovative technology in their classrooms.

The OCL facilitation that has been described is capable of promoting social interaction and group involvement in learning, including providing broad opportunities to get to know each other, using both asynchronous and synchronous interaction tools, providing consistent feedback, and implementing intercultural communication learning that is desirable (Hur et al., 2020). A study by Yang et al. (2021) concluded that providing teachers with opportunities to change their role by turning their teaching experiences into knowledge products can stimulate teacher initiatives in collaborative learning. From the participant's point of view, the facility to carry out OCL, both synchronous and asynchronous, while participating in TPE has provided many advantages, especially in overcoming problems of time, distance, and geography. This is in line with a study in learning participants by Busch et al. (2021), which stated that a good community, flexibility, and openness were advantages of OCL, since learners did not have to physically come to the learning location, thus saving a time and money, and had increased flexibility because distance and geographic participation were no longer a problem.

Activities Carried Out by Teachers While Participating in OCL

Observational data, reinforced by interview and documentation data, shows that participants completed various collaborative activities while participating in the TPE. They carried out various activities such as inventorying their daily problems in teaching, designing learning based on innovative solutions to overcome their learning problems, carrying out learning practices to implement their learning designs, and reflecting together on the learning practices they had carried out (see Figure 3). The TPE participants were facilitated to carry out the learning process and community online. They collaborated in designing, implementing, evaluating, and reflecting on innovative learning while participating in the TPE. They exchanged ideas, provided input, ideas or information about solutions to learning problems, encouraged each other, exchanged experiences, and received feedback, both from fellow participants and from experts and practitioners. The activity represents an online learning community, and more specifically, OCL, occurs among the participants. They do this through forums provided at the LMS or through Zoom meetings and WhatsApp groups. The learning process and collaborative

activities found in this research align with the assertion that several indicators can be considered to identify the occurrence of active learning and collaboration in an online learning community, namely: 1) active interactions, 2) exchange of learning resources, 3) expressions of support and encouragement, 4) knowledge that is built through social interaction, and 5) a willingness to give each other constructive criticism and suggestions (Altowairiki, 2021).

OCL has the potential to reduce learner isolation, help collaborating participants gain more profound levels of constructing knowledge, and achieve desired outcomes. This can be done by giving and receiving support (emotional and cognitive), discussing ideas, making agreements, listening to opinions, exchanging information and points of view, and comparing alternative ideas, interpretations, and representations (Altowairiki, 2021). In this case, Teras and Kartoglu (2017) emphasised that one of the keys to successful and effective teacher professional development is the realisation of collaborative knowledge construction through collegial sharing activities, teamwork, and interaction and collaboration between participants. Interaction and collaboration are essential for teachers as adult learners and has been widely identified as an important activity in driving the effectiveness of professional learning, since these features promote social aspects of learning through involvement in learning communities (Powell & Bodur, 2019).

The Contribution of OCL in Strengthening the Improvement of Teacher Competence

Observational data, reinforced by interview and documentation data, show that the TPE participants expressed various changes and improvements in their competence in teaching (see Figure 5), including cultivating themselves as individuals who can solve their daily problems by having many discussions with fellow teachers and experts and reading a variety of the latest literature to find relevant and innovative solutions. Apart from that, changes and improvements in teaching competencies are becoming dominant because they are being developed to design and implement innovative learning by integrating relevant, innovative, and up-to-date ICT-based approaches, models, and learning media. Through the design process and innovative ICT-based learning practices, they demonstrated that their ICT competency had increased significantly. The learning and collaboration process during the TPE, which was carried out in an online learning environment, also built ICT literacy for the TPE participants.

In addition to overcoming problems regarding teaching standards, under qualification and low competence, in-service TPE in Indonesia are expected to improve specific abilities, including carrying out innovative and enjoyable learning, integrating critical thinking and problem-solving, communication and collaborative skills, creativity and innovative skills, information and communication technology literacy, contextual learning skills, and information and media literacy (Directorate General of Teachers, 2020, 2021). These competencies are developed through online learning activities, one of which employs various OCL activities, as described in the previous section. While designing learning practices, carrying out learning practices, and reflecting after completing the learning practices, they intensively collaborate with fellow participants, experts, and practitioners through various online facilities such as LMS, Zoom meetings, and WhatsApp.

Research data shows that they felt an increase in their competence, at least in terms of: designing innovative learning, implementing the design in several learning practices, understanding and implementing various learning models, developing and utilising ICT-based learning media, and actively socialising in the ICT-based teacher community using the devices they have. The explanation of this research data is in line with the results of previous research,

which concluded that collaboration among teachers, practitioners, and experts is a bridge that links theory and practice, and such collaboration can offer opportunities to gain diverse thoughts, increase teaching competence, and understand the curriculum and their teaching practice (O'Dowd & Dooly, 2022).

Other findings show that collaboration helps teachers develop communication and collaboration skills, increase confidence in working with fellow teachers, increase technology skills and self-efficacy for technology integration, and increase high levels of satisfaction with collaborative work (Hur et al., 2020). Integration between the formal learning environment, through virtual learning using specific online learning platforms, and informal learning spaces, through certain social media networks, should align with the development of digital competencies at a higher level (Estrada-Molina et al., 2022).

For this reason, teacher collaboration through networks and virtual environments should be encouraged because of its positive effects on the world of teaching, as well as affecting teachers' professional learning, which has the potential to improve the learning processes and outcomes carried out by teachers (García-Martínez et al., 2022). Various positive outcomes were obtained by the participants who took part in OCL, including allowing the participants to collaborate anytime and anywhere, to gain more learning experience than in studying individually, and to promote increased knowledge through social interaction (Zheng et al., 2022). OCL has encouraged the professional and academic development of teachers in Indonesia while participating in TPEs. Learning from fellow teachers is very important for a teacher. Particularly when it is supported by the presence of experts and practitioners who provide more opportunities to share knowledge, insights, and resources, helping teachers improve their interpersonal skills, and gain access to new ideas, primarily research-based ones.

Conclusion and Recommendations

Facilitation of collaborative learning for TPE is needed when learning is carried out in an online learning environment. Thus, OCL facilitation becomes increasingly essential. In this research, programme participants collaborated in designing, implementing, evaluating, and reflecting on innovative learning. Various technological devices such as personal computers or devices, as well as multiple applications such as LMS, WhatsApp and Zoom meetings, were the media most intensively used by TPE participants to discuss and collaborate to actively learn from each other. OCL can afford learners new opportunities to engage in rewarding, productive learning experiences (Gosper & Ifenthaler, 2014). Technological support makes it possible for collaborative learning to occur online. Technology provides opportunities for learners to: 1) be involved in completing shared tasks, 2) communicate with each other, 3) share resources, 4) engage in productive discussion and collaborative processes, 5) engage in the construction of knowledge and skills together, 6) monitor and organise collaborative learning, and 7) find and build a learning community together (Jeong & Hmelo-Silver, 2016).

Various facilities for the occurrence of OCL among teachers, practitioners, and experts, allow them to carry out many activities, such as exchanging ideas, giving each other input, providing ideas or information about solutions to learning problems, encouraging each other, exchanging experiences, and receiving feedback, both from fellow participants and from experts and practitioners. The impact is that they feel an increase in their problem-solving competence, teaching competence and built information and communication technology competence.

Implications

The implication of the findings of this study is that collaborative learning should be of concern to designers and providers of professional teacher learning. Designing an online learning environment not only focuses on the learning system and course content but also pays attention to the fact that students' knowledge is an activity that is formed by utilising knowledge and experience gained from their daily lives, through collaborating, exchanging ideas, or interacting in general (vanOostveen et al., 2019). Hence, in designing learning with an online learning background, it is necessary to facilitate collaborative learning that can strengthen social interaction, build and improve participants' performance in completing all their learning assignments (Cabrera, 2022). Learning from fellow teachers is very important for a teacher, mainly when it is supported by experts and practitioners who provide more opportunities for developing knowledge, experience, and competence. Therefore, for programme designers, it is essential to integrate collaborative learning into the teacher-professional learning model that they have developed. Policymakers regarding TPE must emphasise the importance of collaborative learning among fellow participants, experts, and practitioners in their regulations. We suggest further research in this area could be more specific and examine OCL supports and obstacles, both from the side of the TPE participants themselves or the experts and practitioners who are engaged. It could also look more deeply into effective collaborative learning strategies and models to guarantee the success of a TPE programme for teachers.

Limitations

This research is limited to the qualitative study of Indonesia's TPE. This should be supplemented with a quantitative dimension to describe richer and more diverse data. For example, Indonesia's TPE, which targeted 40 thousand teachers as participants in 2022 (Sakti, 2022), and the wide geographical distribution of teachers in this archipelagic country, should be studied in its various aspects with a broader more representative number of samples, in terms of both ratio and regional representation.

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