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Teacher Collaborative Metacognitive Feedback as the Application of Teacher Leadership Concept to Scaffold Educational Management Students' Metacognition

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Abstract: Teacher leadership theory has underlined the essence of teacher collaboration (TC) in helping students learn better. Also, many studies and theories have argued that TC can be an effective way to provide learning feedback. Thus, this mixed-method study aimed to experimentally examine the effect of teacher collaborative metacognitive feedback (TCMF) on educational management (EM) students' metacognition, to see the different effects on EM students' metacognition as affected by TCMF and by individual teaching metacognitive feedback (ITMF), and to qualitatively probe into students' perceptions of teacher collaboration. The quantitative study conducted a quasi-experimental method by involving 44 EM students. A valid and reliable scale of metacognition adopted from a previous study was utilized as the instrument of data collection. The qualitative study conducted interviews with 8 students selected purposively, and the data were analyzed interactively to reach credible information. This study revealed that TCMF positively and significantly affected EM students' metacognition. TCMF contributed to EM students' metacognition better than ITMF did. The students perceived that TC developed their collaborative skills, continuously supporting their critical thinking skills, intercultural communicative competence, and problem-solving skills. Limitations, implications, and recommendations for further research are discussed.

Keywords: *Metacognition, metacognitive feedback, teacher collaboration, teacher collaborative metacognitive feedback, teacher leadership.*

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Introduction

Teacher leadership research has begun to shift away from solitary, heroic, and charismatic leadership to collaborative leadership (Wan et al., 2018). Teachers who practice leadership principles develop their potential, place a premium on students' learning competencies, and invite colleagues to collaborate in efforts to enhance their pedagogical competencies (Struyve et al., 2014). One of the fundamental concepts of teacher leadership is the application of teacher collaboration (TC) in the classroom (Ronfeldt et al., 2015). TC can be defined as a work concept in which teachers collaborate to plan lessons, implement lessons, provide learning feedback, and evaluate learning (Bottia et al., 2016). Previous studies have echoed that TC is beneficial to students' successful learning outcomes, teacher competency improvement, institutional progress, students' collaborative skills leading to the enhancement of critical thinking, and the embodiment of desired learning (Ibrahim, 2020; Lockton, 2019; Meyer et al., 2020; Warsah et al., 2021).

In the context of higher education learning, the practice of TC is critical to providing backup for students' independent learning skills. One of which is the skills related to metacognition. Students who lack metacognition will be unable to interact effectively and sustainably with learning materials (Çini et al., 2020; Warsah, 2020). Metacognition has two main dimensions: students' awareness of their own thinking processes and their abilities to learn independently (W.

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Chen & Hapgood, 2021; Teng, 2019). However, not all students are able to work with their metacognition. Therefore, metacognition must be deliberately taught in the form of effective metacognitive feedback (MF) (O'Loughlin & Griffith, 2020).

In the context of our students in the educational management (EM) department at a small university in Indonesia, our preliminary research, using students' reflective writing journals, revealed that our students seemed to struggle with metacognition. During learning, they tended to simply wait for the lecturer's explanations of learning materials, whereas many components of learning materials, at their level, were conceptual in nature, necessitating their independent efforts to actively take part in in-depth explorations. Prior to the preliminary study, we had attempted to provide the students with MF in the form of individual teaching by deploying a set of metacognitive prompts, but the reflective written reports they provided did not yet demonstrate any significant pattern of metacognitive improvement as expected. In order to improve their metacognitive skills, in the present study, we have committed to an attempt to apply a principle of teacher leadership by putting TC into practice as an effort to provide MF to students.

Although it appears conceptually and theoretically sound that TC is capable of providing effective learning feedback (Goddard et al., 2015), to the best of our knowledge, no previous studies have provided empirical and experimental data in this line. Prior studies seem to have focused on the factors that support TC, such as giving teachers autonomy to collaborate (Ibrahim, 2020), an institutional support that provides TC training (Gremigni, 2019), the availability of TC networks (García-Martínez et al., 2020), and the presence of institutional leaders who support TC (Datnow, 2018). However, as we already argued, there still exists a literature gap on the discourse *vis-à-vis* the empirically experiment-based effect of TCMF on students' metacognition. Hence, we conduct an experiment to delve into the effect of TCMF on EM students' metacognition. We also seek to find out the difference in students' metacognition as affected by TCMF and as influenced by its counterpart, individual teaching metacognitive feedback (ITMF). Following the experimentation, we further seek to qualitatively probe into students' perceptions of TC. This study is underlain by three research questions: 1) Does TCMF affect EM students' metacognition? 2) Is there any difference in EM students' metacognition between those receiving TCMF and those treated by ITMF? 3) What are the EM students' perceptions of TC?

Literature Review

Teacher Leadership and Teacher Collaboration

In general, teacher leadership is defined as the process by which teachers persuade their peers, principals, and other parties in an educational institution to improve the implementation of teaching and learning for the sake of supporting students' learning and achievements (Meirink et al., 2020). Teachers who use leadership principles, according to Struyve et al. (2014), develop their potential and guide other teachers to improve their pedagogic competencies. A teacher's leadership abilities are reflected in his active role both inside and outside the classroom, identifying and contributing to the learning community, and inspiring other teachers to improve their educational practices (Wan et al., 2018). According to Chen (2020) and Huang (2016), teacher leadership is frequently associated with issues such as teachers' self-empowerment, their roles in school transformation, and their efforts to promote professional learning, focus on the learning process, encourage collaboration with colleagues, engage in decision-making, and deal with external affiliations. Teacher leadership research has also begun to shift away from solitary, heroic, charismatic leadership toward collective leadership (Wan et al., 2018). Prior studies have showcased several dimensions corresponding to teacher leadership, such as the competence of collaboration with colleagues (Ronfeldt et al., 2015), trust (Demir & Akif, 2015), and organizational culture (Kilinç, 2014). According to these dimensions, collaborative competence is the most important that a teacher must develop in order to become a good teacher leader.

The theory of interdependence has conceptualized that collaboration occurs when individuals involved in the collaborative process have a positive sense of interdependence (Carpenter, 2018). A collaborative process is successful when group members actively interact with one another and support one another in order to achieve a shared goal (Anderson & Guerreiro, 2016). TC can be defined as professional interactions that occur between or among teachers in both formal and informal settings (Chen et al., 2020). According to Bottia et al. (2016), TC is a condition of which teachers collaborate with their colleagues to create lessons, avoid redundancy in mapping learning concepts and teaching materials, and find ways to improve compatibility across curricular components. Collaborative teachers are also willing to share accountability for their students' progress and can assist one another in developing the best practice in the classroom (Bach et al., 2020). In practice, the ideal collaborative work for teachers is to work deeply and actively, aiming to produce development and progress in performance while increasing each individual's professionalism (Stevenson et al., 2016). However, as a reflection, not all people are capable of getting engaged in a collaborative work effectively, and people's engagement into one group does not necessarily guarantee that a collaborative work can happen as desirable (Somech & Freedman, 2021). Therefore, collaboration competencies must be consciously developed. According to Hargreaves (2019), TC must follow a specific pattern or framework, or it will result in a goal-achieving trajectory that is off track. In a similar vein, Chen et al. (2020) elucidated that TC does not always improve students' performances. Collaboration can produce ineffective results when collaborative teachers share ineffective learning methods.

TC has the potential to provide effective feedback to students if properly designed. According to Bach et al. (2020), the practice of TC will help teachers conduct effective classroom observations. In this case, class observation is a process of providing feedback to assess students' learning progress. TC, according to Banerjee et al. (2017), will create a space for teachers to build interactive and reflective dialogues between teachers in terms of providing feedback on students' learning. de Jong et al. (2019) explained that the opportunity to provide effective feedback from TC exists not only in the dimension of providing feedback to students but also to the teachers themselves that will subsequently serve as a source to design a better TC pattern. The theoretical arguments presented above clearly demonstrate that TC has enormous potential for providing feedback.

Metacognition and Metacognitive Feedback

Learning is a process of constructing knowledge that involves complex cognitive activities, so students require metacognition, also known as metacognitive awareness, as a management strategy of independent and sustainable learning. Metacognition is a concept in which students learn how to learn through reflective and experiencing processes (Hull & Boulay, 2015). Metacognition is to some extent defined as the awareness of complex cognitive processes that include understanding ways of thinking, regulating thinking, regulating active activities in information processing based on thinking competences, managing knowledge as a product of thinking and learning outcomes, and monitoring and controlling knowledge (Kaur, 2020). Kim (2018) elucidated that metacognition has two basic indicators: knowledge of cognition and cognition regulation. The cognition knowledge encompasses declarative knowledge, procedural knowledge, and conditional knowledge. Declarative knowledge refers to knowledge about what to do about oneself, factors influencing one's knowledge, memory, and skills, factors that affect strategies, and resources required to complete a task. Procedural knowledge is associated with the skills of how to learn effectively. Furthermore, conditional knowledge refers to knowledge about when and why learning strategies are used. The cognition regulation represents executive knowledge, which includes skills in making plans, monitoring, and evaluating one's own learning processes. Also, the cognition regulation depicts the ability to modify the aforesaid three skills during learning processes (Çini et al., 2020). Metacognition is useful for students to solve learning problems and achieve learning goals (Kaur, 2020), provide ways for students to acquire knowledge from their own thinking (Hull & Boulay, 2015), and espouse students to apply continuous, independent learning, which includes the process of paying attention to their own behavior (Kim, 2018).

The provision of MF is a way to improve students' metacognition. MF is the provision of feedback on students' learning abilities based on past states and past experiences as the materials for students to anticipate and formulate solutions to similar learning problems in the future (Panadero, 2017). Guo and Kim (2020); Hull and Boulay (2015); and Urban and Urban (2018, 2021) have described numerous benefits of providing MF. Some of them include: increasing students' concentration during learning, guiding students to study in a more planned manner, shaping students' independent learning behavior, increasing students' self-confidence in learning, training students' accuracy in digesting information while studying, and training students to understand the connectedness of predictive and postdictive dimensions related to their independent learning.

In practice, Kim (2018) distinguished two types of MF: response-oriented modification and process-oriented modification. The former indicates the process of providing MF to students after they have completed a summative test. In this way, the teacher provides feedback on cognitive responses that reflect their students' overconfidence. This type of feedback is intended to make students realize that overconfidence is harmful and has the potential to reduce future's learning persistence. The latter draws the provision of MF during the learning process. Such provision of MF is mediated by active interactions between the teacher and students. The goal of such differing feedback is the same, which is to make students aware that overconfidence is a barrier to maintain the persistent curve of learning and to attain successful learning. The provision of MF, in the form of both response-oriented and process-oriented categories, can be realized through the use of media such as reflective journals or reflective student writing and metacognitive prompts to be responded by students (Guo & Kim, 2020; Kaur, 2020; Kim, 2018).

Methodology

Research Design

The present study adopted a sequential mixed-method design to provide the answers to three research problems corresponding to the effect of TCMF on EM students' metacognition, the difference in metacognition between the students receiving TCMF and those treated by ITMF, and the students' perceptions of TC.

Quantitative Study

A quasi-experimental study was executed to address the first and second research problems pertinent to the effect of TCMF on EM students' metacognition and the difference in metacognition between the students receiving TCMF and those treated by ITMF. This study employed a pretest-posttest controlled-group design in a way that incorporated student participants grouped into two classes, the experimental and control classes. We engaged 44 participants

selected randomly from 80 students as the population. They were the first semester undergraduate students from the EM department at a small university in Indonesia. The participants were approximately homogenous in terms of cultural affiliations since most of them originated from nearby cities with no significant cultural differences. Received from the campus administrators, their demographic information in terms of ages (18-19 years old), level of education, and prior learning competences, indicated homogenous conditions as well. The experiment was held from March 9th, 2021 to June 16th, 2021. During the conduction of this study, the participants were taking a subject called "the Introduction of Educational Management" with us, the researchers of this study, as the regular lecturers. It was worth noting that our preliminary study uncovered that the participants had insufficient levels of metacognition in learning. Thus, this experiment providing them with TCMF might be a good solution to their metacognitive issues.

Drawing upon the deployed design, the experiment split the 44 participants into two classes, the experimental and control classes. Before the provision of learning interventions in both classes, each student of each class was given a pretest in the form of metacognitive scale. The students of both classes were subsequently engaged in eight-meeting treatments to learn eight topics mapped in the syllabus of the Introduction to Educational Management (see Table 1). Twenty-two students in the experimental class were taught with a learning intervention in the form of TCMF. We conceptualized this intervention in a way that applied the regular practice of TC (Bach et al., 2020) embedded in collaborative teaching along with the implementation of the techniques and media of MF (Guo & Kim, 2020; Kaur, 2020; Kim, 2018) (see Table 2). As the researchers and also the participants' regular lecturers, we directly took part in this study as the actors of TCMF in the experimental class. Other 22 students in the control class were taught with a learning intervention in the form of ITMF (see Table 2). The teachers' and students' roles during the experimentation can be seen in Table 3. After the students of both classes received eight-meeting learning interventions, they further took the posttest in the form of metacognitive scale.

Table 1. The Experiment Schedule and Learning Topics

Meeting	Learning topics of the experimental and control classes
1st	Pretests of both classes: Metacognition scale
2nd	The basic concept of educational management
3rd	Educational organizations
4th	The management of curriculum
5th	The management of students
6th	The management of teachers
7th	The management of educational facilities
8th	The management of educational budgets
9th	The management of the relationship between educational institutions and society
10th	Posttests of both classes: Metacognition scale

Table 2. Main Activities in the Treatments of Experimental and Control Classes

Phases	Experimental class (TCMF)	Control class (ITMF)
Pre-teaching	Planning the lesson together	Planning the lesson individually
	Exchanging the material between the two teachers	Preparing the individual teacher's own material
	Discussing with the fellow teacher the teaching method, technique, and strategy	Preparing the teaching method, technique, and strategy individually
	Discussing with the fellow teacher the teaching roles, parts, and actions	Preparing to adjust the teaching role, part, and actions with an individual teaching mode
While-teaching	Applying a team-teaching model to teach the entire material and to engage students in learning activities and tasks	Applying an individual teaching model to teach the entire material and to engage students in learning activities and tasks
	Jointly implementing the technique of process-oriented metacognitive feedback	Individually implementing the technique of process-oriented metacognitive feedback
	Jointly investigating students' learning postdiction and prediction during process-oriented metacognitive feedback	Individually investigating students' learning postdiction and prediction during process-oriented metacognitive feedback
	Jointly using the media in the form of reflective writing journal during the application of process-oriented metacognitive feedback with compatible teachers' roles	Individually using the media in the form of reflective writing journal during the application of process-oriented metacognitive feedback
	Jointly implementing the technique of response-oriented metacognitive feedback	Individually implementing the technique of response-oriented metacognitive feedback
	Jointly using the media in the form of metacognitive prompt during the application of response-oriented metacognitive feedback	Individually using the media in the form of metacognitive prompt during the application of response-oriented metacognitive feedback

Table 2. Continued

Phases	Experimental class (TCMF)	Control class (ITMF)
Post-teaching	Meeting with the fellow teacher to talk about and reflect on students' learning progress Meeting with the fellow teacher to talk about and reflect on students' metacognitive progress Giving inspirations to each other (between the two teachers) Giving feedback to each other (between the two teachers)	Reflecting on students' learning progress individually Reflecting on students' metacognitive progress individually

Table 3. Teachers' and Students' Roles during Learning with TCMF and ITMF

Teacher Collaborative Metacognitive Feedback		**Individual Teaching Metacognitive Feedback**	
Teachers (T1 and T2)	**Students (SS)**	**Teacher (T)**	**Students (SS)**
T1: Introducing the material's scope (T2 helps organize T1's presentation slides)	Paying attention to T1's introduction	Introducing the material's scope	Paying attention to T's introduction
T2: Building knowledge for the whole class by exemplifying cases (T1 helps organize T2's presentation slides)	Getting engaged into whole class interactions	Building knowledge for the whole class by exemplifying cases	Getting engaged into whole class interactions
T1: Tasking SS with group work discussions (T2 helps organize SS' positions and distribute the materials)	Working in groups to discuss the materials and cases assigned	Tasking SS with a reading project related to the learned cases	Reading the assigned papers
T2: Explaining to SS about how to identify the assigned cases, to discuss the cases, and to solve the cases (process-oriented MF) (T1 helps organize the T2's presentation slides)	Following the MF explanations given by T2 during group work discussions	Explaining to SS about how to identify the emerging cases on papers and to construct their understanding of the learned cases (process-oriented MF)	Following the MF explanations given by T during the reading project
T1 and T2: monitoring group work discussions	Interacting and getting help from T1 and T2 during group discussions	Monitoring students' activities during the reading project	Getting help from T if SS find any problems
T1 and T2: Assigning SS to write reflective journals concerning what they have got from group discussions and what they need for further learning (process-oriented MF)	Writing out reflective journals to draw what SS have learned and need to learn further	Assigning SS to write reflective journals concerning what they have got from the reading project and what they need for further learning (process-oriented MF)	Writing out reflective journals to draw what SS have learned and need to learn further
T1: Assigning student representatives to present their discussion results (T2 helps organize the class activity)	Presenting the results of group work discussions done by the student representatives	Assigning student representatives to present what they have read	Presenting SS' understanding based on the reading project done by the student representatives
T1 and T2: Guiding and monitoring students' material presentations	Getting engaged in a whole class discussion	Guiding and monitoring students' material presentations	Getting engaged in a whole class discussion
T1 and T2: Providing metacognitive prompts to direct students to reflect on their strengths and weakness about the learned materials and to trigger students' creativity to choose which strategies to be applied for further learning	Filling in the metacognitive prompts and returning the prompts to T1 and T2	Providing metacognitive prompts to direct students to reflect on their strengths and weakness about the learned materials and to trigger students' creativity to choose which strategies to be applied for further learning	Filling in the metacognitive prompts and returning the prompts to T

Table 1 displays the experiment schedule and learning topics of both experimental and control classes. Table 2 highlights the main activities of treatments or learning interventions for both classes. Subsequently, Table 3 presents the teachers' and students' roles during learning in both classes. Specifically for the contents of Tables 2 and 3, we designed the treatment activities and teachers' and students' roles according to the recommendations of previous researchers working on the issues of TC (Bach et al., 2020; Datnow, 2018; Liu et al., 2021; Meyer et al., 2020) and MF (Guo & Kim, 2020; Kaur, 2020; Kim, 2018).

The data of experimentation were garnered using Schraw and Dennison's (1994) metacognition scale. In this study, this scale was used as the pretest and posttest. Schraw and Dennison (1994) developed this scale into 52 items representing the constructs and sub-constructs of metacognition. The first construct, cognition knowledge, consisted of three sub-constructs, such as declarative knowledge (8 items), procedural knowledge (5 items), and conditional knowledge (6 items). The second construct, cognition regulation, comprised five sub-indicators, such as planning (7 items), information management (8 items), monitoring (7 items), debugging (5 items), and evaluation (6 items). This scale had been validated by Schraw and Dennison (1994) with high internal consistency of items ranging from 0.88 to 0.93. This scale was also reliable with the alpha of < 0.70. Other researchers, e.g. Alt and Raichel (2020), had used this scale to measure students' metacognition. The foregoing strengthened our conviction that Schraw and Dennison's (1994) scale was effective and trustworthy to be utilized to measure students' metacognition. We also follow Alt and Raichel's (2020) suggestions regarding the scale measurement in which we provided six options of responses along with each item from "not all typical of me" to "very typical of me". Before the metacognition scale was utilized as the pretest and posttest, it had previously been translated into Indonesian in order that the participants could easily comprehend the actual intention of each item. We incorporated two experienced translators to conduct translation and back translation for the sake of guaranteeing the meaning equivalence of each item translated. During both experimental and control classes' pretests and posttests, the students of both classes were given 60 minutes to accomplish the metacognition scale.

The EM students' metacognition levels in both classes were quantified by deploying the SPSS 23 program through five stages. The first was to do a descriptive analysis of the basic computation. The second was to conduct the normality test, as the prerequisite test for the next stage, to examine if the data were normally distributed. The third was to do the paired-samples *t* test (for the data with normal distribution) or Wilcoxon test (for the data with abnormal distribution) to see if TCMF and ITMF affected students' metacognition. In other words, the third stage was functioned as to answer the first research question. The fourth was to conduct the homogeneity test, as the prerequisite test for the final stage, to see if the data were homogenous. The fifth was to do the independent sample *t* test (for the data with homogenous and normal distribution) or Mann Whitney test (for the data with inhomogeneous and abnormal distribution) to see if there was a difference in students' metacognition between those receiving TCMF and those treated by ITMF. Simply put, the fifth stage was to answer the second research question.

Qualitative Study

The qualitative study was conducted to address the third research problem, which concerned the EM students' perceptions of TC. 8 students who had previously received TCMF in the experimental class were selected as the qualitative participants purposively. We considered a number of criteria when selecting the participants. First, the participants were those who had participated in learning processes that applied TC in the provision of MF. Second, they were sufficiently interactive and communicative to allow for the exchange of viewpoints. Third, they could be accessed easily. Fourth, they volunteered to be the participants. The qualitative data were collected through interviews conducted on June 25th, 2021. During interviews, the participants were asked to negotiate their perceptions (opinions, views, responses) of TC. The interview data were analyzed using an interactive model as suggested by Miles et al. (2014). Such an analysis model fell into a few phases, such as collecting data, condensing data, displaying data, and concluding data. As previously stated, the data were collected using interviews. The process of data condensation was performed by grouping the raw data according to the emerging codes or themes. Further, the most representative data from their theme-based groups were chosen to be presented in an organized fashion. Additionally, the data were presented through a figure of illustration, selected interview transcripts, explanations, interpretations, and theoretical and contextual discussions. Finally, the data processing results were conclusively summarized.

Results

Quantitative Results

Before processing the data to address the first and second research problems, we have conducted a descriptive analysis to obtain a general description of data on the basis of the minimum, maximum, mean, and standard deviation scores. Table 4 displays the results of descriptive analysis.

Table 4. Descriptive Analysis

Categories	N	Minimum	Maximum	Mean	SD
Pretest (Experimental class)	22	56	77	67.77	6.332
Posttest (Experimental class)	22	80	92	85.55	3.582
Pretest (Control class)	22	55	84	67.55	7.915
Posttest (Control class)	22	67	89	77.55	5.369
Valid N (Listwise)	22				

Using the above data of descriptive analysis, we proceeded to conduct the normality test in order to examine if the data were normally distributed and to have a yardstick of which formula to be utilized to answer the first research problem concerning the effect of TCMF on EM students' metacognition. Table 5 depicts the results of normality test.

Table 5. The Results of Normality Test

Class	Computation using Kolmogorov–Smirnov			Computation using Shapiro-Wilk		
	Results	df	Sig.	Results	df	Sig.
Pretest (Experimental class)	0.133	22	0.200	0.945	22	0.250
Posttest (Experimental class)	0.121	22	0.200	0.948	22	0.291
Pretest (Control class)	0.109	22	0.200	0.965	22	0.591
Posttest (Control class)	0.166	22	0.118	0.955	22	0.396

Table 5 demonstrates that the data of the present study were normally distributed because the results of normality test, using either Kolmogorov–Smirnov or Shapiro-Wilk, showcased that the significance values exceeded the yardstick value of 0.05. Such normal distribution of data led us to further choose the paired-samples *t* test instead of Wilcoxon test as the formula to address the effect of TCMF on EM students' metacognition.

The Effect of Teacher Collaborative Metacognitive Feedback on Educational Management Students' Metacognition

Because we conducted a quasi-experimental study by incorporating the counterpart of TCMF, the so-called ITMF, we therefore computed the effects of both metacognitive interventions on students' metacognition. To this end, Table 6 shows the computation results by employing the formula of paired-samples *t* test.

Table 6. Computation Results of Both Interventions' Effects on Students' Metacognition

	Differences according to each pair					t	df	Sig. (2-tailed)
	Mean	SD	Std. error mean	Level of confidence (95%) Lower	Upper			
Pretest – posttest in the experimental class (Pair 1)	-17.8	7.7	1.6	-21.2	-14.3	-10.7	21	0.000
Pretest – posttest in the control class (Pair 2)	-10.0	5.8	1.2	-12.5	-7.4	-8.0	21	0.000

As shown in Table 6, the output of pair 1 indicated the Sig. (2-tailed) value of 0.000 which was lower than 0.05. It meant that there was a significant difference between the posttest mean and the pretest mean in the experimental class (TCMF). In a similar vein, the output of pair 2 also proved the Sig. (2-tailed) value of 0.000 which was lower than 0.05. The foregoing also informed that there was a significant difference between the posttest mean and the pretest mean in the control class (ITMF). The output of pair 1 clearly underlined that there was a significant and positive effect of TCMF on EM students' metacognition. Anchored in Schraw and Dennison's (1994) metacognition model, the present study's result explained that, after being taught with TCMF, the EM students experienced significant improvements in their cognitive abilities to process the known learning materials, to choose and apply appropriate learning strategies, and to identify when and why using such learning strategies. They also experienced improvements in the executive and independent skills at learning, such as making plans or setting learning goals, managing information received during learning, controlling their own learning processes, correcting their own mistakes in comprehension and performance during learning, and evaluating their own learning progress.

The Difference between the Effect of Teacher Collaborative Metacognitive Feedback and That of Individual Teaching Metacognitive Feedback

Before processing the data *vis-à-vis* the effect difference across classes, we had conducted the homogeneity test as the prerequisite test in prior since the result would determine the next computation formula to be deployed. Table 7 presents the results of homogeneity test.

Table 7. Homogeneity Test Results

	Criteria	Levene statistic	df1	df2	Sig.
Students' metacognition	According to mean	1.038	1	42	0.314
	According to mean	1.037	1	42	0.314
	According to and with adjusted df	1.037	1	32.319	0.316
	According to mean trimmed	1.037	1	42	0.314

Table 7 informs that the significance value according to mean was of 0.314 which exceeded 0.05. It demonstrated that the variance of posttest data owned by both experimental and control classes was homogenous. Therefore, it was clearly identifiable that we could proceed to use the independent sample *t* test instead of Mann Whitney as the formula to do the next computation to see the difference in metacognition between the students receiving TCMF and those treated by ITMF. To this end, the computation employed the formula of independent sample *t* test as shown in Table 8.

Table 8. Computation Results of Difference in Interventions' Effects on Students' Metacognition across Classes

	Levene's test for the equality of variances		t-test for equality of means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. Error difference	Level of confidence (95%)	
								Lower	Upper
Equal variance assumed	1.038	0.314	5.813	42	0.000	8.000	1.376	5.223	10.777

Table 8 showcases that the computation resulted in the sig. (2-tailed) value of 0.000, which was lower than 0.05. This informed that there was a difference between the posttest mean gained by the students in the experimental class (TCMF) and those of the control class (ITMF). Simply put, TCMF affected EM students' metacognition better than ITMF did. Grounded in Schraw and Dennison's (1994) metacognition model, it could be interpreted from the present study's data that, compared ITMF, TCMF contributed more to students' metacognitive improvements in both knowledge and regulation.

Qualitative Results

Educational Management Students' Perceptions of Teacher Collaboration

Finished with the experimentation, we continuously pursued the qualitative data to probe into EM students' perceptions of TC by means of interviews. The interview processes involved 8 students who had received eight-meeting learning interventions with TC. The interview data represented one theme followed by three sub-themes drawing the students' positive perceptions of TC. The flow of interview data could be viewed in figure 1.

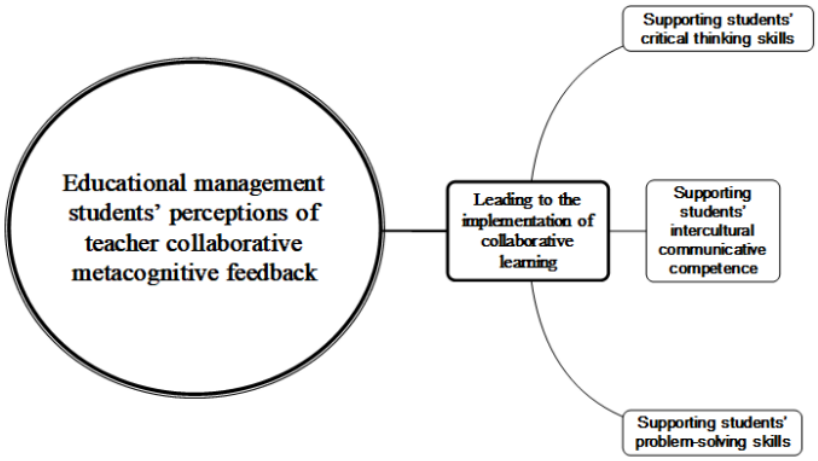

Figure 1. The Flow of Interview Data

During interviews, some students opined that TC most often treated them to work collaboratively in groups while learning. This could be caused by the nature of TC itself leading to the view of learning as a constructivism-based and socio-cultural process. The foregoing is represented by the following transcripts of interviews.

> *One of the most intriguing aspects of learning with collaborative teachers is the transformation of learning from individual to collaborative (Student 7).*
>
> *Collaborative teachers, in my opinion, tend to design collaborative classroom learning as well, so that we have a group-work activity almost every meeting (Student 4).*
>
> *This group work is interesting to me because it allows my friends and me to exchange ideas and help each other when we have learning problems (Student 6).*

The flow of interview data also addressed the benefits of collaborative learning created by TC. The first benefit was that the students were trained to be critical thinkers during learning collaboratively. In this discourse, a few students shared the following information.

> *We were assigned group discussion activities that were controlled by both teachers at almost every meeting during learning with collaborative teachers. During the group discussion, the teachers encouraged us to actively search for references on our mobiles by reading various articles about the topics we were studying. Furthermore, the collaborating teachers asked us a series of critical thinking questions, such as cause-and-effect questions, reasoning questions, and questions to help us synthesize information (Student 1).*
>
> *I also believe that the collaborative learning we experienced in class trained my friends and me to look for a common thread among the various pieces of information that we read (Student 3).*
>
> *Collaborative learning has exposed me to the emergence of different ideas from my friends, forcing me to think in a comparative dimension in order to construct information from these diverse ideas (Student 8).*

The concept of causal thinking, reasoning, synthesis, and comparative thinking described in the preceding transcript is an umbrella term commonly referred to as critical thinking. In short, students believed that collaborative learning designed by collaborative teachers helped them develop critical thinking skills. Some students subsequently perceived that collaborative learning led by TC in some ways increased their intercultural communicative competence. Among the raw data addressing similar information, the following interview transcript was chosen to demonstrate the perceived benefit of TC in terms of intercultural communicative competence.

> *To be honest, I liked the collaborative learning activities facilitated by collaborative teachers. Such collaborative learning allowed us to actively argue. We were taught not only how to argue, but also how to be wise and open-minded when confronted with opposing viewpoints. We were taught to be individuals who were accepting differences, including differing viewpoints that emerged during learning (Student 2).*

The essence of being tolerant towards perspective differences as echoed by student 2 in the above transcript portrayed the core of intercultural communicative competence. Another sub-theme codified from the interview data talked about a condition of which TC supported students' problem-solving skills. This could be seen in the following transcript of interview deliberately solicited from the raw data.

> *I agree with my friend that collaborative learning designed by collaborative teachers cultivated open-mindedness in us. Furthermore, I sensed another essence in which we were also trained to be able to solve problems in learning. The collaborative learning process forced us to exchange knowledge in order to formulate solutions to problems packaged in the form of teachers' questions (Student 5).*

The selected transcripts of interviews above drew a set of information which conceptualized that TC inclined to construct learning process in the sense of collaboration as well. Such collaborative learning subsequently supported students' critical thinking skills, intercultural communicative competence, and problem-solving skills.

Discussion

The contextual issue regarding low metacognition faced by our students in the EM department has led us to the application of TCMF as an embodiment of teacher leadership principle. This initiation has been theoretically backed up by previous academicians (Bach et al., 2020; Banerjee et al., 2017; de Jong et al., 2019) who argued that TC has strong control over students' learning including the provision of feedback. Hence, the foregoing premise has motivated us to conduct an experiment to test TCMF, compared with ITMF as the conventional intervention, in terms of their effects on EM students' metacognition. We have designed the present study using a mixed-method design in a way that probes into the students' perceptions of TC after the experimentation has been done.

The first result of this study showcased that TCMF positively and significantly affected EM students' metacognition. The second result strongly supported the foregoing by demonstrating that TCMF affected students' metacognition better that ITMF did although ITMF was sufficiently contributive to the improvement of students' metacognition as well. The

experiment clearly proved that TCMF had positively increased EM students' competences associated with what Alt and Raichel (2020) called cognition knowledge and cognition regulation. Previous researchers, such as Curwen et al. (2010), who conducted a study on the read-write project on the basis of TC drew an implication that such TC can increase not only teachers' metacognition but also students' metacognition. A possible reason is that TC allows two or more teachers to have brainstormed the pedagogic system before they apply it in the classroom, and such brainstorming guides teaching processes to run in a well-organized fashion (Banerjee et al., 2017). A good teaching management will lead students to the acquisition of a good learning management as well, in which the students are trained to be self-regulated. Guo and Kim (2020) asserted that self-regulation is one domain of metacognition, indicating learners' abilities to plan, monitor, and evaluate their own learning. Saka (2021) conducting a study in the field of mathematics also echoed the common thread that TC is contributive to students' declarative knowledge and control over students' learning, such as helping students identify and modify their strengths and weaknesses during learning. Saka's (2021) study demonstrated that TC is effective in both giving students feedback on metacognition and improving their metacognition. However, the exact and empirical data based on experimentation with respect to the effect of TCMF on students' metacognition, to the best of our knowledge, is firstly uncovered and proven by the present study, while prior studies have only provided a sort of theoretical argumentations in this line.

Other studies in prior have also addressed different contributions of TC especially towards the teachers themselves as the actors of TC. For example, a study conducted by Ibrahim (2020) informed that TC is extremely beneficial because it allows teachers to learn from one another. According to Chen et al. (2020) TC fosters the professional learning of teachers, helps teachers be more competent in their teaching practices, and positively triggers teachers to continue making learning innovations. TC is discerned as a critical capacity building strategy for teachers, altering the pattern of lesson analysis and curriculum reconstruction (Datnow, 2018). Steyn (2017) elucidated that TC allows teachers to respectively share understanding and emotional experiences. In a study, Datnow (2018) emphasized that TC, by nature, educates teachers about how to use quality time for learning and improving their teaching performances. Albeit being different, the above findings of prior studies do not counter the present study's results. Such previous studies just have different foci on learning the benefits of TC. The current study's results even add up information in respect of TC's benefit especially in terms of improving students' metacognition.

The current study subsequently revealed EM students' positive perceptions of TC. The students perceived that TC led to the implementation of collaborative learning, in which collaborative learning supported the students' critical thinking skills, intercultural communicative competence, and problem-solving skills. This study supports Ibrahim's (2020) assertion that TC has a potency to facilitate students' collaborative learning. The essence of collaborative learning can be seen in the conditions under which students establish active interactions with others while learning, engage others in negotiating emerging issues from the learned materials, actively use learning strategies while collaborating, and take responsibility for their own learning (Chatterjee & Correia, 2020; Hautala & Schmidt, 2019). Within the framework of our study, it was discernible that the collaborative teachers' compatibility of teaching roles naturally prompted them to construct collaborative learning activities for students. Warsah's et al. (2021) study, on the effect of collaborative learning on students' critical thinking skills, has justified students' perceptions of collaborative learning as affected by TC in the current study. Other studies have also confirmed the benefits of collaborative learning as perceived by the students in the present study. For instance, de Hei et al. (2020) uncovered the perceived effect of collaborative learning on the improvement of students' intercultural communicative competence. Rustanuarsi and Karyati (2019) and Syahmani et al. (2020) confirmed in their studies that collaborative learning positively affects students' problem-solving skills.

Conclusion

Anchored in the contextual issue of poor metacognition faced by our students in the EM department, and grounded in a leadership theory highlighting the usefulness of TC alongside various theoretical arguments that emphasize the potency of TC in terms of providing learning feedback, we have conducted the current study to test the effect of TCMF on EM students' metacognition along with the students' perceptions of TC. This study has drawn a conclusion that TCMF has a positive and significant effect on EM students' metacognition. The effect of TCMF is strong due to contributing more to students' metacognition than its counterpart, ITMF. TC is perceived positively by the students because it develops students' collaborative learning skills. Such skills are perceived to have supported students' critical thinking, intercultural communicative competence, and problem-solving skills.

Recommendation

The findings of this study end up with conceptual and practical recommendations. We draw the conceptual aspect in the form of implications, and we propose the practical aspect in the form of recommendation for further studies. There are some implications we can mention. First, TC should be practiced on a regular basis because it has a hopeful and favorable effect on students' metacognition. Second, various external elements in an educational institution must support the practice of TC in order to assist teachers in collaborating effectively. Supports from educational leaders, administrative administration, and curricular systems should be seriously given to help the effectiveness of TC in increasing students' metacognition and learning advancement. External elements of TC as such are important since not

all teachers are able to create their own TC frameworks due to a variety of issues such as limited pedagogical knowledge, pedagogical experiences, and time constraints. External supports can help pave the way for TC to conduct excellent teaching practices. Third, teachers at all levels are encouraged to continue to develop their leadership skills, particularly in the area of TC due to its potency to increase students' collaborative skills, leading to the improvements of students' critical thinking, intercultural communicative competence, and problem-solving skills.

As a practical recommendation, the present study has highlighted five potential variables which can be examined by further studies, such as teacher leadership, TC, TCMF, metacognition, collaborative learning skills, critical thinking skills, intercultural communicative competence, and problem-solving skills. Hence, it is recommended that further studies be executed to examine the aforesaid variables using psychometric analyses, so that such studies could develop novel models of theories which are useful for academicians working on topics related to teacher leadership, TC, and learning.

Limitations

This study is not without flaws. This study was conducted to apply a leadership principle in the form of TCMF only within the teacher dimension, disregarding university leaders' and structural administrators' supports that aid in the implementation of the TC framework. We admit that the TC framework built just on the basis of the teacher dimension would be weaker than one built on the basis of the teacher, principal, and administration dimensions. In our case, the university's administrative structure and executives had not worked on a TC orientation. This study's environment became such a natural limitation that we could not control. Despite this, we took significant efforts to create the TC framework in a theory-to-practice manner.

Authorship Contribution Statement

Asha: Concept and design, data analysis / interpretation, drafting manuscript, securing funding, and final approval. Hamenghubuwono: Drafting manuscript, critical revision, and technical or material support. Morganna: Drafting manuscript, statistical analysis, and critical revision of manuscript. Warsah: Data acquisition, statistical analysis, and technical or material support. Alfarabi: Admin and data analysis / interpretation

References

Alt, D., & Raichel, N. (2020). International and multidisciplinary perspectives reflective journaling and metacognitive awareness: Insights from a longitudinal study in higher education. *Reflective Practice*, *21*(2), 1–14. https://doi.org/10.1080/14623943.2020.1716708

Anderson, R. C., & Guerreiro, M. (2016). Are all biases bad? Collaborative grounded theory in developmental evaluation of education policy. *Journal of MultiDisciplinary Evaluation*, *12*(27), 44–57. https://bit.ly/34NjgfN

Bach, A., Böhnke, A., & Thiel, F. (2020). Improving instructional competencies through individualized staff development and teacher collaboration in German schools. *International Journal of Educational Management*, *34*(8), 1289–1302. https://doi.org/10.1108/IJEM-08-2019-0294

Banerjee, N., Stearns, E., Moller, S., & Mickelson, R. A. (2017). Teacher job satisfaction and student achievement: The roles of teacher professional community and teacher collaboration in schools. *American Journal of Education*, *123*(2), 203–241. https://doi.org/10.1086/689932

Bottia, M. C., Valentino, L., Moller, S., Arlin Mickelson, R., & Stearns, E. (2016). Teacher collaboration and latinos/as' mathematics achievement trajectories. *American Journal of Education*, *122*(4), 505–535. https://doi.org/10.1086/687274

Carpenter, D. (2018). Intellectual and physical shared workspace: Professional learning communities and the collaborative culture. *International Journal of Educational Management*, *32*(1), 121–140. https://doi.org/10.1108/IJEM-05-2017-0104

Chatterjee, R., & Correia, A. P. (2020). Online students' attitudes toward collaborative learning and sense of community. *American Journal of Distance Education*, *34*(1), 53–68. https://doi.org/10.1080/08923647.2020.1703479

Chen, J. (2020). Understanding teacher leaders' behaviours: Development and validation of the teacher leadership inventory. *Educational Management Administration and Leadership*. Advance online publication. https://doi.org/10.1177/1741143220945704

Chen, W., & Hapgood, S. (2021). Understanding knowledge, participation and learning in L2 collaborative writing: A metacognitive theory perspective. *Language Teaching Research*, *25*(2), 256–281. https://doi.org/10.1177/1362168819837560

Chen, W. L., Elchert, D., & Asikin-Garmager, A. (2020). Comparing the effects of teacher collaboration on student performance in Taiwan, Hong Kong and Singapore. *Compare*, *50*(4), 515–532. https://doi.org/10.1080/03057925.2018.1528863

Çini, A., Malmberg, J., & Järvelä, S. (2020). How individual metacognitive awareness relates to situation-specific metacognitive interpretations of collaborative learning tasks. *Educational Studies*. Advance online publication. https://doi.org/10.1080/03055698.2020.1834359

Curwen, M. S., Miller, R. G., White-smith, K. a., & Calfee, R. C. (2010). Increasing teachers' metacognition develops students' higher learning during content area literacy instruction: Findings from the read-write cycle project. *Issues in Teacher Education*, *19*(2), 127–151. https://bit.ly/3v2rFXs

Datnow, A. (2018). Time for change? The emotions of teacher collaboration and reform. *Journal of Professional Capital and Community*, *3*(3), 157–172. https://doi.org/10.1108/JPCC-12-2017-0028

de Hei, M., Tabacaru, C., Sjoer, E., Rippe, R., & Walenkamp, J. (2020). Developing intercultural competence through collaborative learning in international higher education. *Journal of Studies in International Education*, *24*(2), 190–211. https://doi.org/10.1177/1028315319826226

de Jong, L., Meirink, J., & Admiraal, W. (2019). School-based teacher collaboration: Different learning opportunities across various contexts. *Teaching and Teacher Education*, *86*, 102925. https://doi.org/10.1016/j.tate.2019.102925

Demir, K., & Akif, M. (2015). The effect of organizational trust on the culture of teacher leadership in primary schools. *Educational Sciences: Theory & Practice*, *15*(3), 621–634. https://doi.org/10.12738/estp.2015.3.2337

García-Martínez, I., Tadeu, P., Montenegro-Rueda, M., & Fernández-Batanero, J. M. (2020). Networking for online teacher collaboration. *Interactive Learning Environments*. Advance online publication. https://doi.org/10.1080/10494820.2020.1764057

Goddard, R., Goddard, Y., Kim, E. S., & Miller, R. (2015). A theoretical and empirical analysis of the roles of instructional leadership, teacher collaboration, and collective efficacy beliefs in support of student learning. *American Journal of Education*, *121*(4), 501–530. https://doi.org/10.1086/681925

Gremigni, E. (2019). Alternating school-work pathways in Italy: Some remarks on the "competence society." *Partecipazione e Conflitto*, *12*(1), 217–238. https://doi.org/10.1285/i20356609v12i1p217

Guo, W., & Kim, J. H. (2020). Using metacognitive monitoring feedback to improve student learning performance in a real-time location-based augmented reality environment. In L. Cromarty, R. Shirwalker, & P. Wang (Eds.), *Proceedings of the IISE Annual Conference and Expo 2020* (pp. 55–60). Curran Associates, Inc. https://www.proceedings.com/58547.html

Hargreaves, A. (2019). Teacher collaboration: 30 years of research on its nature, forms, limitations and effects. *Teachers and Teaching: Theory and Practice*, *25*(5), 603–621. https://doi.org/10.1080/13540602.2019.1639499

Hautala, J., & Schmidt, S. (2019). Learning across distances: An international collaborative learning project between Berlin and Turku. *Journal of Geography in Higher Education*, *43*(2), 181–200. https://doi.org/10.1080/03098265.2019.1599331

Huang, T. (2016). Linking the private and public: Teacher leadership and teacher education in the reflexive modernity. *European Journal of Teacher Education*, *39*(2), 222–237. https://doi.org/10.1080/02619768.2015.1116512

Hull, A., & Boulay, B. (2015). Motivational and metacognitive feedback in SQL-Tutor. *Computer Science Education*, *25*(2), 238–256. https://doi.org/10.1080/08993408.2015.1033143

Ibrahim, A. (2020). What hurts or helps teacher collaboration? Evidence from UAE schools. *Prospects*. Advance online publication. https://doi.org/10.1007/s11125-019-09459-9

Kaur, N. (2020). Metacognitive awareness in lexical learning among Malaysian students. *International Journal of English Language and Literature Studies*, *9*(3), 161–171. https://doi.org/10.18488/journal.23.2020.93.161.171

Kilinç, A. Ç. (2014). Examining the relationship between teacher leadership and school climate. *Kuram ve Uygulamada Egitim Bilimleri*, *14*(5), 1729–1742. https://doi.org/10.12738/estp.2014.5.2159

Kim, J. H. (2018). The effect of metacognitive monitoring feedback on performance in a computer-based training simulation. *Applied Ergonomics*, *67*, 193–202. https://doi.org/10.1016/j.apergo.2017.10.006

Liu, Y., Bellibaş, M. Ş., & Gümüş, S. (2021). The effect of instructional leadership and distributed leadership on teacher self-efficacy and job satisfaction: mediating roles of supportive school culture and teacher collaboration. *Educational Management Administration and Leadership*, *49*(3), 430–453. https://doi.org/10.1177/1741143220910438

Lockton, M. (2019). Chasing joint work: Administrators' efforts to structure teacher collaboration. *School Leadership and Management*, *39*(5), 496–518. https://doi.org/10.1080/13632434.2018.1564269

Meirink, J., Van Der Want, A., Louws, M., Meijer, P., Oolbekkink-Marchand, H., & Schaap, H. (2020). Beginning teachers' opportunities for enacting informal teacher leadership: Perceptions of teachers and school management staff members. *European Journal of Teacher Education*, *43*(2), 243–257.

https://doi.org/10.1080/02619768.2019.1672654

Meyer, A., Richter, D., & Hartung-Beck, V. (2020). The relationship between principal leadership and teacher collaboration: Investigating the mediating effect of teachers' collective efficacy. *Educational Management Administration and Leadership*. Advance online publication. https://doi.org/10.1177/1741143220945698

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook*. SAGE Publications, Inc.

O'Loughlin, V. D., & Griffith, L. M. (2020). Developing student metacognition through reflective writing in an upper level undergraduate anatomy course. *Anatomical Sciences Education*, *13*(6), 680–693. https://doi.org/10.1002/ase.1945

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, *8*, 1–28. https://doi.org/10.3389/fpsyg.2017.00422

Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal*, *52*(3), 475–514. https://doi.org/10.3102/0002831215585562

Rustanuarsi, R., & Karyati, K. (2019). The effectiveness of collaborative learning model with challenging task on students mathematical problem-solving skills. *Journal of Physics: Conference Series*, *1157*(4), 1–7. https://doi.org/10.1088/1742-6596/1157/4/042058

Saka, A. O. (2021). Can teacher collaboration improve students' academic achievement in junior secondary mathematics? *Asian Journal of University Education*, *17*(1), 33–46. https://doi.org/10.24191/ajue.v17i1.8727

Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, *19*, 460–475. https://doi.org/10.1006/ceps.1994.1033

Somech, A., & Freedman, I. (2021). Translating teamwork into school effectiveness: A systematic review of two decades of research. *European Journal of Educational Management*, *4*(2), 109–127. https://doi.org/10.12973/eujem.4.2.109

Stevenson, M., Hedberg, J. G., O'Sullivan, K. A., & Howe, C. (2016). Leading learning: The role of school leaders in supporting continuous professional development. *Professional Development in Education*, *42*(5), 818–835. https://doi.org/10.1080/19415257.2015.1114507

Steyn, G. (2017). Transformational learning through teacher collaboration: A case study. *Koers - Bulletin for Christian Scholarship*, *82*(1), 2220. https://doi.org/10.19108/KOERS.82.1.2220

Struyve, C., Meredith, C., & Gielen, S. (2014). Who am I and where do I belong? The perception and evaluation of teacher leaders concerning teacher leadership practices and micropolitics in schools. *Journal of Educational Change*, *15*(2), 203–230. https://doi.org/10.1007/s10833-013-9226-5

Syahmani, Leny, & Iriani, R. (2020). Computer support collaborative learning-retrosynthetic analysis model to improve students' problem solving ability. *Journal of Physics: Conference Series*, *1422*(1), 1–8. https://doi.org/10.1088/1742-6596/1422/1/012014

Teng, M. F. (2019). The role of metacognitive knowledge and regulation in mediating university EFL learners ' writing performance. *Innovation in Language Learning and Teaching*, *14*(5), 1–15. https://doi.org/10.1080/17501229.2019.1615493

Urban, K., & Urban, M. (2018). Influence of fluid intelligence on accuracy of metacognitive monitoring in preschool children fades with the calibration feedback. *Studia Psychologica*, *60*(2), 123–136. https://doi.org/10.21909/sp.2018.02.757

Urban, K., & Urban, M. (2021). Anchoring effect of performance feedback on accuracy of metacognitive monitoring in preschool children. *Europe's Journal of Psychology*, *17*(1), 104–118. https://doi.org/10.5964/ejop.2397

Wan, S. W. Y., Tse, Y. S., Tsang, W. K., Lee, T. W. K., Wong, Y. Y., Wan, A. W. T., & Wan, W. P. E. (2018). 'Who can support me?': Studying teacher leadership in a Hong Kong primary school. *Educational Management Administration and Leadership*, *48*(1), 133–163. https://doi.org/10.1177/1741143218792910

Warsah, I. (2020). Forgiveness viewed from positive psychology and Islam. *Islamic Guidance and Counseling Journal*, *3*(2), 2614–1566. https://doi.org/10.25217/igcj.v3i2.878

Warsah, I., Morganna, R., Uyun, M., Hamengkubuwono, & Afandi, M. (2021). The impact of collaborative learning on learners' critical thinking skills. *International Journal of Instruction*, *14*(2), 443–460. https://doi.org/10.29333/iji.2021.14225a

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