Correlation Between Student Internet Access and Teachers' Self-Efficacy in Teaching Online Classes

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Abstract—The most critical requirement of an online class is the availability of the internet for a teacher and students alike. The objective of this study was to find out how student internet access correlates to teachers' self-efficacy in teaching an online class. This quantitative study used categorical data obtained using two questionnaires: one assessed three constructs of student internet access, and the other measured teachers' self-efficacy in teaching an online class. The questionnaires were distributed online to in-service teachers who had completed or almost completed an online teaching professional development program in four major universities in Indonesia. As many as 158 teachers completed both questionnaires. The data were analyzed using Spearman Correlation Coefficient to reject the null hypothesis at the significance level of 0.05. The correlation was calculated for seven teacher categories, i.e., teachers in urban areas, teachers in rural areas, elementary school teachers, junior high school teachers, senior high school teachers, experienced teachers, and inexperienced teachers. The research results show that teacher-reported student internet access correlates with teachers' self-efficacy in teaching an online class. The level of correlation ranges from weak to strong correlations, with moderate correlations for most teacher groups. This study also discusses the research implication for teacher education.

Keywords—online class, signal quality, student internet access, teacher education, teachers' self-efficacy

1 Introduction

Both students and teachers across the world are familiar with the issues of slow internet connection during online classes [1], especially during the Covid-19 pandemic when online classes became mandatory for many. Slow internet connection impacts the learning process when lessons are delivered through online conference meetings such as Zoom, Webex, and Google Meet. These online learning tools are most widely preferred among EFL teachers [2]. This type of online learning is also recommended in language classes because classroom interaction is extremely important to facilitate language learning and acquisition [3]. However, the use of these tools is problematic for students who live in areas with slow or no internet service, such as in rural and semi-

rural areas. Zoom meetings require a high-speed internet connection [4], which many people in rural areas do not have access to[5]. Slow internet connection distracts teachers, especially when their students complain that they cannot join the meeting, accidentally get disconnected from the meeting, and experience distorted sound. Therefore, slow internet connection among their students can potentially affect teachers' motivation in teaching. Teaching motivation is closely related to self-efficacy [6], which is one of the factors that determines the success of the teaching and learning process. Studies related to online classrooms have offered conclusions regarding how internet access issues affect the teaching, learning, and assessment process in an e-classroom [7]–[9], but there has been little research on how the students' internet access statistically correlates to teachers' self-efficacy. Thus, there is inadequate empirical evidence regarding the extent of its impact on teachers' self-efficacy in teaching. Therefore, the current research is aimed at analyzing the correlation between student internet access and teachers' self-efficacy in teaching EFL classes. The results of this study can be used as a significant input for stakeholders, including the government, in planning online classes at school.

2 Literature review

2.1 Current urgency for online learning

The sudden closures of schools worldwide due to the Covid-19 pandemic has challenged the face-to-face in-classroom teaching practices that the education sector currently relies on [10]. Many schools closed at the start of the pandemic, and all teaching and learning were immediately moved to an online platform, changing the way teachers and students interact up until now [11], [12]. According to UNESCO, about 195 countries have closed schools in the spring, 2020, and interrupted more than 1.5 billion students worldwide [13]. Some schools in cities and in many developed countries may have, to some extent, introduced blended online learning before the pandemic. Therefore, teachers and students in these schools could easily embrace full online learning [2]. A study on 950 students at a private school in Georgia reported that a sudden shift to online learning has been successful during the early pandemic [14].

On the other hand, schools in rural areas, such as in Zambia, were unprepared to suddenly adopt an online learning system [15] because they have never implemented any type of online learning. Unprepared schools might pose challenges to teachers and students when attempting online learning [2]. These schools usually do not have a unified online learning system, and neither the teachers nor students have ever participated in online classes before. This reality made us realize that there is an urgent need for the education sector to be prepared for a similar scenario in the future, as suggested in [16]. In addition, schools need to start developing an effective online learning system, train their teachers and get the students familiar with the system even after the pandemic ends. A research study revealed that teachers who are familiar with the use of ICT in the classroom did not have any problem in switching to an online classroom [17].

2.2   Problems in internet access

Internet access is at the heart of online education. Both teachers and students need stable internet access to ensure the effectiveness of online teaching. Many previous researchers have pointed out that online education is easily accessible and can accommodate students in remote areas [1], is up to 92 percent as effective as conventional classrooms [18], and "offers the possibility to learn from anywhere, anytime, in any rhythm, with any means." [19] However, if users' internet connection is unstable, online education can be a problem instead of a solution. In Indonesia, for example, internet access is very limited in suburban and remote areas [20]. For example, students in Somali had to travel to university campuses in order to access online learning since internet connection at a university is better than at home [21]. Such practices seem to defeat the purpose of online learning, which aims to reach students at many locations without making them physically come to campus. The situation in Somali and Indonesia contrasts with what happened in Georgia, where switching from conventional classrooms to online classes has been successful. This is partly because around 79 percent of Georgian homes are connected to the internet, and people living in cities and villages had comparable access to the internet [14].

Problems in internet access might hamper an effective online classroom experience [22]–[24]. A survey was conducted involving 322 Indonesian school students who participated in online learning during the Covid-19 pandemic and found that 55 percent of students were unsatisfied with the online learning mode [25]. The author mentioned that slow internet connections prevented online learning from being delivered as intended. Another study also found that internet access is the main obstacle for Indonesian students when participating in online activities [26]. In Indonesia, even in a well-known university located in Jakarta, the country's capital city, professors reported that unstable internet connection caused students to experience muted audio, audio and video delays, and to get disconnected from the meeting during the synchronous video meetings [27]. Poor internet access does not only have negative impacts on students but also on teachers who have prepared online teaching materials. Students' internet access issues might influence teacher behaviors as well, including their self-efficacy in teaching an online class.

2.3   Teachers' self-efficacy and its significance

Self-efficacy is the belief held by an individual regarding their ability to perform a certain task [28]. In the context of pedagogy, teachers' self-efficacy is the teacher's self-perceived ability to perform their job effectively [29]. Teachers' self-efficacy improves when they attend pre-service training, and negative experience during their teaching profession does not affect their acquired self-efficacy [30]. Teachers with better self-efficacy teach their students better than those with lower self-efficacy. Studies have found that teachers with high self-efficacy are more committed to fulfilling the need of their students [31], more excited about teaching [32], and have better job satisfaction [33]. In addition, teachers with more positive self-efficacy were found to use a

variety of methods in teaching and get involved in innovative teacher development programs [34]. When both groups participate in those development programs, researchers found that efficacious teachers tended to use the instructional knowledge gained from the program more compared to teachers with low self-efficacy [35]. They can also cope with student behavioral problems better than teachers with low efficacy [36]. In addition, they believe that they are partly responsible for low student learning achievement [37], motivating them to improve their teaching practice [38]. This behavior explains why many studies reviewed in Ref. [39] found that teachers' self-efficacy can influence student learning achievement and motivation.

2.4 Factors influencing self-efficacy

Research has indicated there are a variety of factors that influence teacher self-efficacy. Teacher development programs, both short-term and long-term, have been found to improve teachers' self-efficacy [40], [41]. This improvement is expected because a development program improves teachers' pedagogical knowledge, which is strongly associated with teachers' self-efficacy [42]. Pedagogical knowledge includes "knowledge of student understanding, instructional strategies and representations, knowledge of curriculum, and teacher's values and beliefs about education" [43], and those components have been predicted to influence teachers' self-efficacy [43]. In addition to pedagogical knowledge, subject matter knowledge is also a factor influencing teachers' self-efficacy [44]. It is more likely that teachers with better mastery of their subject matter would help students to learn successfully, as found in reference. [45]. Therefore, it is expected that those teachers have positive self-efficacy in teaching [46]. Finally, teaching experience is the other factor that influences teachers' self-efficacy because it is associated with mastery, which is claimed in Ref. [28] to be one of the sources of self-efficacy. Regarding the use of e-learning, familiarity with technology in teaching influences teachers' self-efficacy in teaching an online class [47]. Research has demonstrated that teachers' self-efficacy in using technology helps determine whether or not technology is effectively used in the classroom [39].

3 Methodology

This study is quantitative in nature. The collected data are both categorical and numerical, and they will be analyzed using inferential statistics. Descriptive statistics are employed only to provide the overview of the data prior to inferential statistical analysis.

3.1 Participants

The participants for this research are in-service teachers who have just completed professional and pedagogical development training conducted online and financially supported by the Ministry of Education. The tuition fees were paid by the participants. The training was organized by 64 teacher training faculties in Indonesia. However, the

participants of this research were in-service teachers attending the training in four universities due to limited access to other institutions. All those universities are well-established state universities in Indonesia. There were 156 teachers from 21 provinces in Indonesia completing the research instruments. Most of the teachers were between 29–40 years old. The distribution of the participants who completed the research instruments is provided in Figure 1.
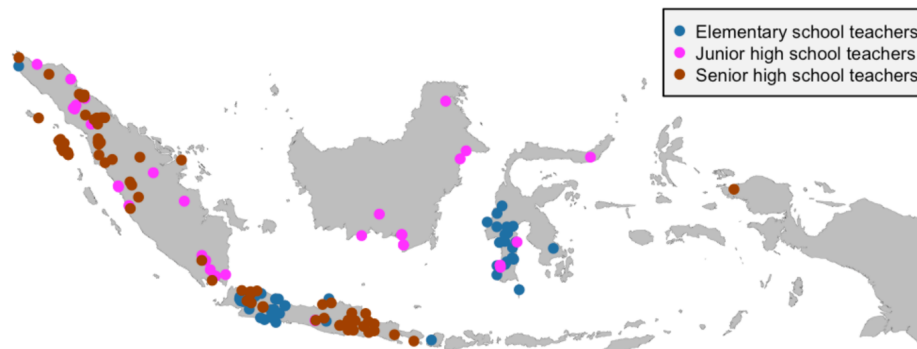

Fig. 1. Distribution of participant school location (map of Indonesia)

Figure 1 shows that the teachers are from schools spread across Indonesia, except the eastern part of Indonesia. The participants were teachers in all school levels, i.e., elementary school (51 teachers), junior high school (34 teachers), and senior high school (73 teachers). Most elementary school teachers taught on Java and Sulawesi, and the majority of senior high school teachers were from Java and Sumatera. Finally, the majority of teachers reported that they taught in rural areas (104 teachers), some taught in semi-urban areas (13 teachers), and others in urban areas (39 teachers). The illustration of the school locations is provided in Figure 2.
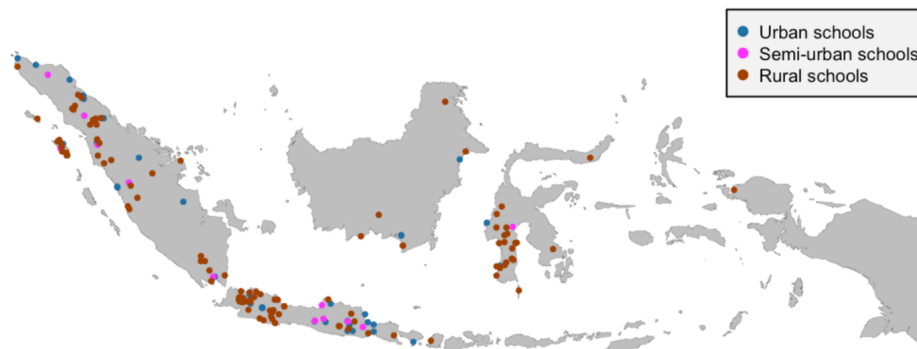

Fig. 2. Distribution of school location (map of Indonesia)

In the program, the teachers were taught by lecturers, and the online learning platform used for the training was Moodle 3. During training, lecturers introduced and discussed every topic using Zoom, and teachers read the materials and complete exercises online. Therefore, the participants are very proficient in using the LMS and familiar with video conference meetings.

3.2 Instruments

The data were collected using a set of questionnaires consisting of two parts. The first part of the questionnaire was to collect information about internet access among the participants' students. The questionnaire was conducted through a four-point Likert scale (4 = *exactly true* to 1 = *not true at all*). The questionnaire was designed based on four three constructs, i.e., network quality, device availability, and cost of the data plan. Four items were constructed for each construct. The internal consistency of the questionnaire based on Cronbach's alpha was 0.91, which is a very high consistency coefficient. The second part of the questionnaire is the self-efficacy questionnaire based on Ref. [48], which originally consisted of 11 items. To obtain more accurate data, five more items were added. The questionnaire uses the six-point Likert scale (6 = *exactly true* to 1 = *not true at all*). The construct of the questionnaire includes job accomplishment, skill development, social interaction, and ability to cope with job stress. The internal consistency of the self-efficacy scale was 0.96 based on Cronbach's alpha.

3.3 Data collection

The questionnaire was delivered to the teachers using Google Forms by program administration staff. The researchers' information was given in the questionnaire, but they did not communicate with the researchers either directly or through other modes of communication. Before the participants opened the questionnaire link, they were asked to read a participant informed consent form consisting of the research description, questionnaire description, information about how the results benefit the participants, confidentiality information, voluntary participation and withdrawal information, and the researchers' contact information. Afterward, participants who agreed to participate clicked the link to access the questionnaire. It took about 15 minutes to complete both parts of the questionnaire.

3.4 Data analysis

This research is meant to identify the correlation between student internet access and teachers' self-efficacy in teaching online. The data for both variables were nominal or categorical, where student internet access was considered the independent variable for this research, and teachers' self-efficacy was the dependent variable. Thus, the correlation between the two variables was calculated using a non-parametric correlation formula, i.e., Spearman rank correlation coefficient. The null hypothesis tested in this research was that "there is no correlation between the dependent variable and independent

variable." The hypothesis is rejected at the significance level of 0.05. This small significance level was used to avoid Type I error, i.e., rejecting the null hypothesis when it is actually true. In categorizing the level of correlation, we used the definition provided in Ref. [49] because no variable was controlled. Thus, a correlation of $r \geq .50$ or more is considered strong, $r \geq .30$ is moderate, and considered weak for $r < .30$.

4 Results

This research utilized categorical data, and for simplicity in analyses, the results from both questionnaires were coded into rank, i.e., 1–4 for internet access scale and 1–6 for self-efficacy. The data were to be analyzed using an inferential statistic, but a descriptive statistic is used to show how the data looked. Figure 3 shows the results of confirmatory factor analysis (CFA) for each item of both questionnaires and the correlations among constructs of student internet access. These factor analyses are significant to show whether each item in the questionnaire has a weakness and whether it fits the construct.
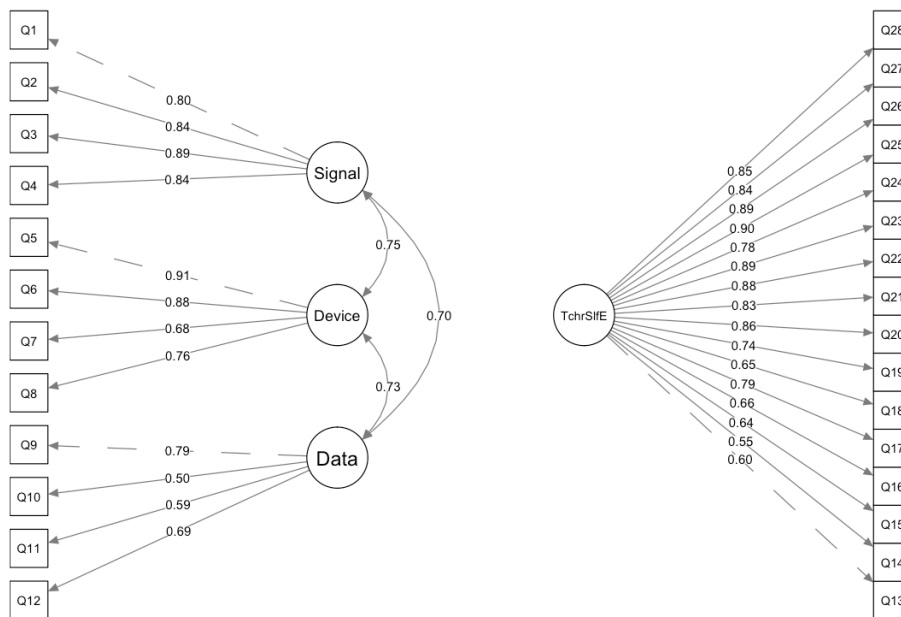

Fig. 3. Results of CFA for student internet access (left) and teachers' self-efficacy (right)

Figure 3 shows that all items loaded sufficiently to each factor in student internet access, and no item had a factor loading less than 0.30, which is similar to teacher self-efficacy. Thus, all items were included in the analysis. In addition, the latent variable of student internet access, which is the independent variable in this research, was significantly correlated to other latent variables or factors, i.e., 0.75 (signal quality and

device availability), 0.74 (device availability and the cost of the data plan), and 0.71 (signal quality and the cost of the data plan). Therefore, the results of the analysis could be confidently used to draw a conclusion about the effect of student internet access on teachers' self-efficacy in teaching online.

4.1 Descriptive statistics

Student internet access, as the independent variable, among students in Indonesian high schools based on teacher-reported data, shows that many students did not have good internet access during online learning in terms of signal quality, device availability to access the internet, and cost of the data plan. More details are provided in Figure 4.
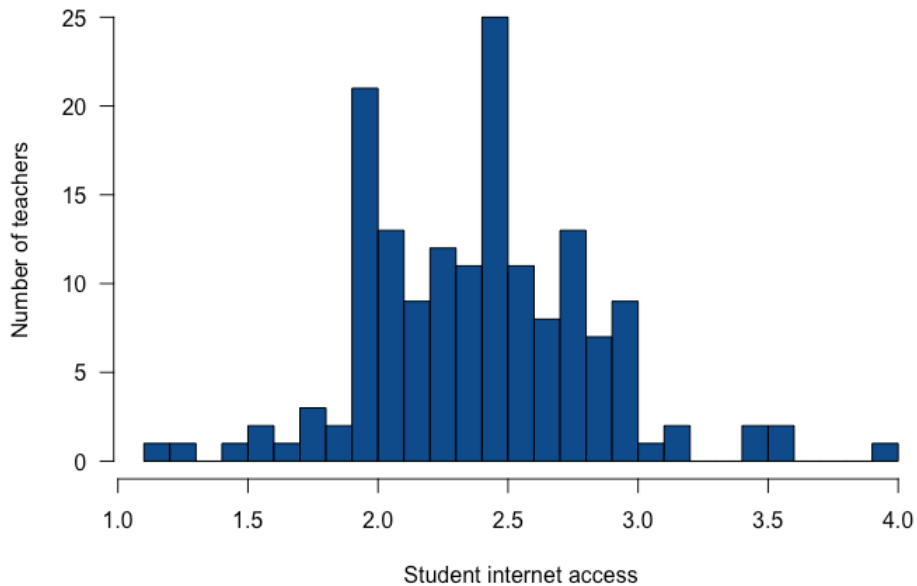

Fig. 4. Teacher reported student's internet access

Based on Figure 4, many students still do not have good internet access, where the average score for the internet access scale is 2.4, which is less than 3 (agree). The teachers' self-efficacy in teaching an online class is presented in Figure 5.
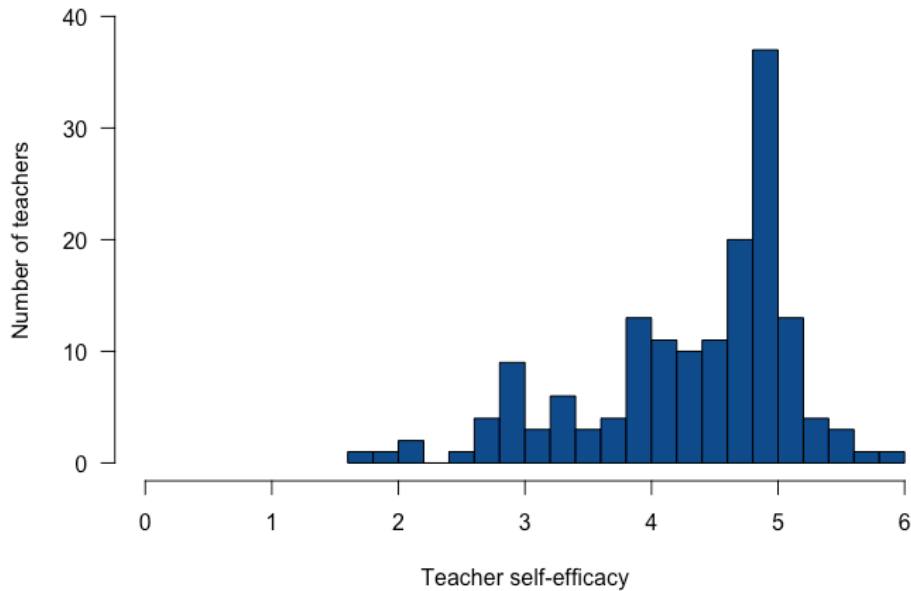
Fig. 5. Teachers' self-efficacy in teaching online classes

Based on the figure, most teachers reported positive self-efficacy in teaching online classes. Most teachers agree that they can teach online classes successfully, although some are very skeptical. The further analyses unpack the correlation between student internet access and teacher self-efficacy.

4.2 Correlation analyses

To determine whether student internet access influences teachers' self-efficacy in teaching online classes, the correlation between both variables was calculated using Spearman Correlation Coefficient.

Table 1. Results of correlation between student internet access and teacher self-efficacy

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	158	385468	0.41	0.0000
Student signal quality vs. teacher self-efficacy	158	398630	0.39	0.0000
Student device availability vs. teacher self-efficacy	158	396703	0.40	0.0000
Student data plan cost vs. teacher self-efficacy	158	489733	0.25	0.0012

All constructs in student internet access, both when calculated separately or when they were combined, were significantly correlated to teacher self-efficacy. The levels of correlation for all pairs were moderate, as stated in Ref. [49], except for the last pair, which is weak between student data plan cost and teacher self-efficacy. For more detailed analyses, the data were divided into several groups based on the characteristics

of the participants, such as school area classification, school levels, and the teacher's internet access.

Almost similar results are shown in Table 2, as in Table 1, that positive correlations were significant for most pairs except for student data plan cost, where the correlation was not evident (p-value > 0.05). The correlation between student internet access and the self-efficacy of teachers teaching in urban schools was moderate, including its constructs.

Table 2. Results of correlation analysis among teachers in urban areas

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	39	5514.4	0.44	0.0047
Student signal quality vs. teacher self-efficacy	39	6457.5	0.34	0.0307
Student device availability vs. teacher self-efficacy	39	6672.8	0.32	0.0438
Student data plan cost vs. teacher self-efficacy	39	6895.6	0.30	0.0616

Among teachers in rural areas, student internet access and all its constructs were associated with teacher self-efficacy. The level of correlation was moderate for almost all pairs. Only the cost of the data plan showed a weak correlation to the teacher self-efficacy.

Table 3. Results of correlation analysis among teachers in rural areas

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	106	106656	0.46	0.0000
Student signal quality vs. teacher self-efficacy	106	113364	0.43	0.0000
Student device availability vs. teacher self-efficacy	106	109051	0.45	0.0000
Student data plan cost vs. teacher self-efficacy	106	147642	0.26	0.0080

Based on Table 4, elementary school teachers' self-efficacy is moderately associated with student internet access. The constructs of device availability and signal quality to the access internet for online learning are also moderately correlated to teacher self-efficacy. However, there was no correlation between data plan cost and elementary school teacher self-efficacy.

Table 4. Results of correlation analysis among elementary school teachers

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	51	14051	0.36	0.0086
Student signal quality vs. teacher self-efficacy	51	14534	0.34	0.0139
Student device availability vs. teacher self-efficacy	51	13131	0.41	0.0031
Student data plan cost vs. teacher self-efficacy	51	19167	0.13	0.3533

Among junior high school teachers, as presented in Table 5, teacher-perceived student internet access, along with its constructs, is associated with teachers' self-efficacy

in teaching online. The correlations are strong for student internet access and one of its constructs – devise availability, and moderate for the other two constructs.

Table 5. Results of correlation analysis among junior high school teachers

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	34	2787.5	0.57	0.0004
Student signal quality vs. teacher self-efficacy	34	3540.4	0.46	0.0063
Student device availability vs. teacher self-efficacy	34	2557.4	0.61	0.0001
Student data plan cost vs. teacher self-efficacy	34	3866.1	0.41	0.0162

In contrast to junior high school teachers, senior high school teachers' self-efficacy was weakly associated with student internet access. In addition, only one of the student internet access constructs was correlated to the teacher self-efficacy, i.e., signal quality, but the correlation was weak.

Table 6. Results of correlation analysis among senior high school teachers

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	73	48559	0.25	0.0323
Student signal quality vs. teacher self-efficacy	73	46104	0.29	0.0132
Student device availability vs. teacher self-efficacy	73	53116	0.18	0.1262
Student data plan cost vs. teacher self-efficacy	73	52466	0.19	0.1062

Table 7 shows how student internet access was associated with teachers' self-efficacy in teaching online classes among teachers who always or usually teach online classes. In general, a moderate association is observed in all pairs, with a weak association when the analyses were performed with each construct of student internet access.

Table 7. Results of correlation analysis among teachers who often taught online

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	113	164085	0.32	0.0006
Student signal quality vs. teacher self-efficacy	113	172606	0.28	0.0025
Student device availability vs. teacher self-efficacy	113	169958	0.29	0.0016
Student data plan cost vs. teacher self-efficacy	113	185384	0.23	0.0147

The student internet access and teachers' self-efficacy are well correlated among teachers who rarely or never actually taught an online class. The correlation was moderate and positive between internet access, along with two of its constructs – signal quality and device availability and teacher self-efficacy. A correlation was not found between data plan cost and weak signal quality. To compare the results of all correlation analyses, the results are presented in Table 8.

**Table 8.** Results of correlation analysis among teachers who rarely or never taught online

Pairs	N	S	R	p-value
Student internet access vs. teacher self-efficacy	45	8517.4	0.44	0.0026
Student signal quality vs. teacher self-efficacy	45	9647.7	0.36	0.0138
Student device availability vs. teacher self-efficacy	45	8259.8	0.46	0.0017
Student data plan cost vs. teacher self-efficacy	45	11943	0.21	0.1596

Table 9 shows a summary of correlations for all teachers and for teachers with different characteristics specified into seven categories. The correlation was generally moderate, with some weak correlations and two strong correlations. One of the internet access constructs, the cost of the data plan, mostly shows weak correlation or no correlation. A better illustration is provided in Figures 6-13.

Table 9. Summary of correlations

Variables	1	2	3	4	5	6	7	8
Internet access	0.41	0.44	0.46	0.36	0.57	0.25	0.32	0.44
Signal quality	0.39	0.35	0.43	0.34	0.46	0.29	0.28	0.36
Device availability	0.40	0.32	0.45	0.41	0.61	-	0.29	0.46
Cost of Data plan	0.25	-	0.26	-	0.41	-	0.23	-

Note: 1 = all teachers, 2 = teachers in urban areas, 3 = teachers in rural areas, 4 = elementary school teachers, 5 = junior high school teachers, 6 = senior high school teachers, 7 = teachers often teaching online, 8 = teachers rarely or never teaching online
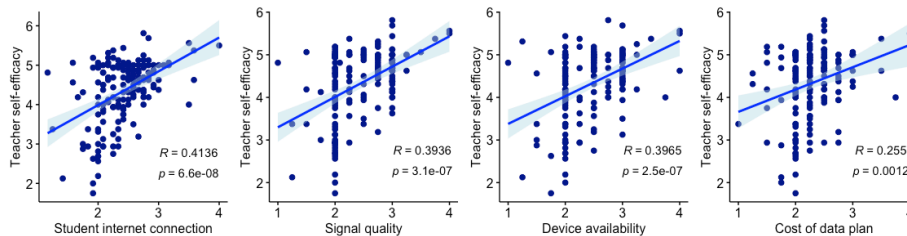
Fig. 6. Results of correlations among all teachers
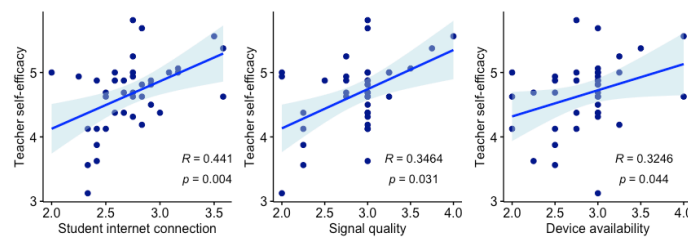
Fig. 7. Results of correlations among teachers teaching in rural schools
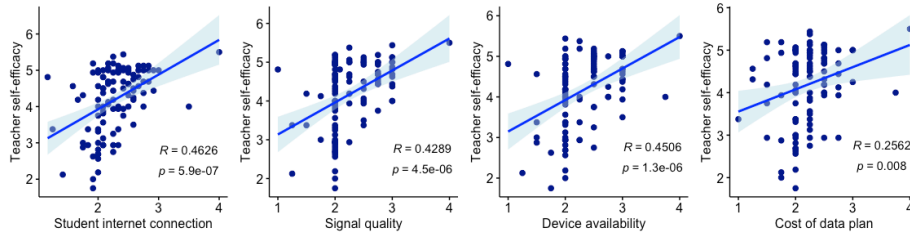
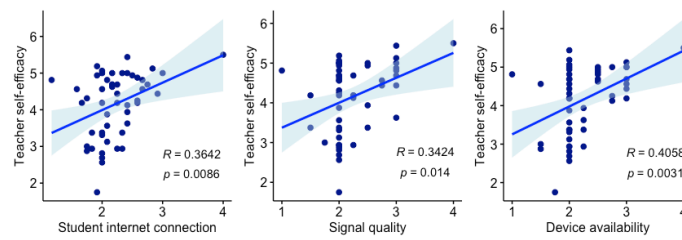**Fig. 8.** Results of correlations among teachers teaching in urban schools

Fig. 9. Results of correlations among elementary school teachers
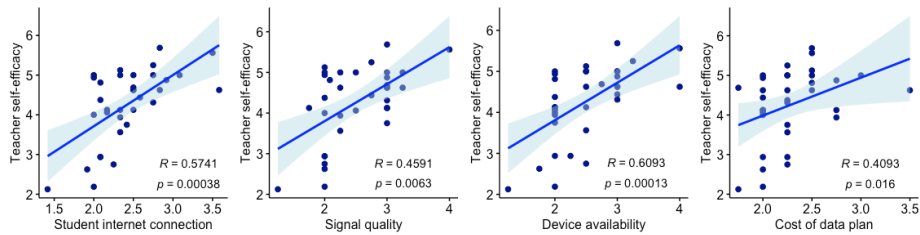

Fig. 10. Results of correlations among junior high school teachers
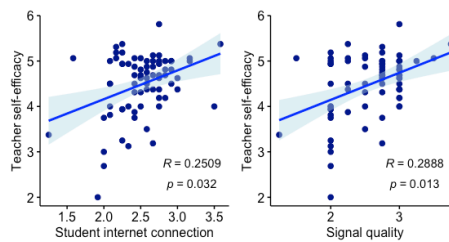

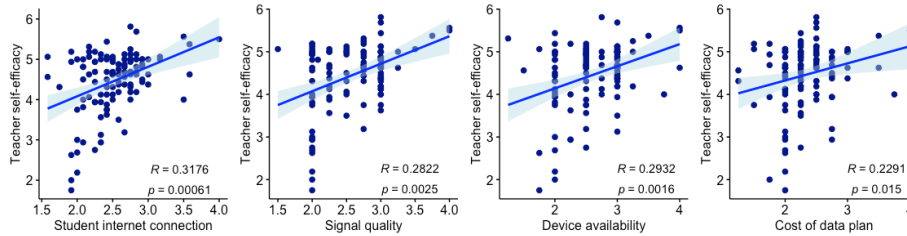**Fig. 11.** Results of correlations among senior high school teachers

Fig. 12. Results of correlations among teachers who often taught online
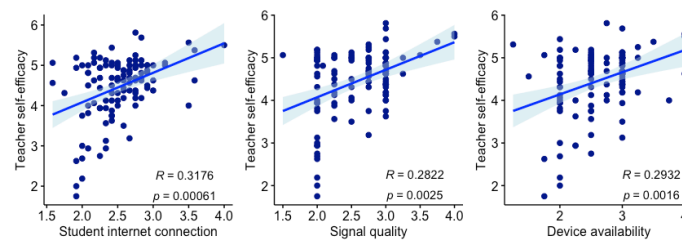

Fig. 13. Results of correlations among teachers who rarely or never taught online

5 Discussion

The main objective of this study was to determine whether there is a correlation between teacher-perceived student internet access and teachers' self-efficacy in teaching online classes. The data were split into several categories based on the teacher characteristics to have a better overview of the correlation. The characteristics include school area – urban and rural areas, school levels, and frequency of teaching online. The result shows that the correlations do exist in weak, moderate, and strong levels between student internet access and teachers' self-efficacy. More specifically, moderate correlations were often found in the first pair, where all constructs of student internet access are combined, and weak correlations were mostly observed for the cost of the data plan.

In general, there were positive moderate to strong correlations between the variables for teachers regardless of the category wo which they belong. These correlations suggest that teachers believe that they would not be able to successfully teach an online class when their students have poor internet access. This result is expected because the internet is a tool that enables interaction in an online classroom. Previous studies have revealed that teachers rely very much on interaction for students' language acquisition [50]. Many teachers consider the interaction between students even more important than the materials presented by the teacher [51]. In addition, teacher and student interaction are significant because they are a way to assess students' material comprehension [52]. Furthermore, students feel that in-class interaction motivates them to communicate [53], [54], which allows them to experiment with the language. In an online

class, internet connection makes interaction possible through video conference applications such as Zoom and Google Meet or chatting services through Learning Management System such as Moodle, Edmodo, and Google Classroom.

Detailed analysis for each construct of internet access and different school-level teachers showed some interesting results, one of which is a weak correlation for all constructs of student internet access and teachers' self-efficacy among teachers who often taught online classes (experienced teachers). This result contrasts with the teachers who rarely or never taught class online, where the levels of correlation were weak for all internet access constructs. The results indicate that teachers who do not have experience teaching online tend to worry if they can successfully teach online classes when their students have difficulty with internet access. Their lack of hands-on experiences might have contributed to their poor perception of the challenges they might encounter when teaching online. In contrast, experienced teachers already know what to expect in online classes and know what to do when problems arise. Thus, these findings support the self-efficacy theory proposed in Ref. [28] that teachers imbued with previous experience in teaching online classes are more confident to execute effective online teaching regardless of their students' internet access.

Looking at the detailed constructs, experienced and inexperienced teachers perceived each construct differently. Inexperienced teachers seem to factor signal quality and device availability in their self-efficacy perception, while those who have taught online do not have any concern with these constructs. Both groups of teachers believed that internet access might influence how well they can teach online classes. This finding may be attributed to the fact that Indonesian internet access is limited in rural areas [55]. Internet access has been the source of concern for many primary school teachers in various provinces in Indonesia when teaching online classes during the Covid-19 pandemic [56].

Another related finding is the correlation between the variables among senior high school teachers. Weak correlations were observed for internet access in general and signal quality, and no correlation was found for device availability. This weak or insignificant correlation implies that senior high school teachers' self-efficacy was not affected by their students' internet access. This result is explained by the previous result that teachers who often taught online were not affected by their students' internet access, unlike teachers who rarely or never taught online. In fact, 85 percent of the senior high school teachers reported that they always or usually taught online during the Covid-19 pandemic, and another 14 percent said that they did it sometimes. Our data also revealed that the percentage of teachers who always or usually taught online was higher in senior high schools than in elementary or junior high schools.

Another significant finding is related to junior high school teachers and elementary school teachers, which contrasts with those of senior high school. The correlations between the variables among senior high school teachers were strong for internet access. One of the internet access constructs was also strongly correlated to senior high school teacher self-efficacy. The correlation for other constructs among the other school teachers was moderate. These correlations are higher than teachers in senior high schools. Since knowledge and experience have been identified as factors influencing teacher self-efficacy, problems in internet access among their students could not affect senior

high school teachers' self-efficacy in teaching online classes. A study confirmed that senior high school teachers reported that they are knowledgeable in integrating ICT in their classroom even when teaching in rural schools [57]. However, junior high school teachers were not as knowledgeable as those of senior high schools on the use of ICT in teaching [58], [59]. A similar conclusion can be made for elementary school teachers [60]. The possible cause for this discrepancy was reported by elementary school teachers, that is, they received very little training on educational technology from the government [61].

Unlike other constructs which correlate to certain degrees with self-efficacy, the cost of the data plan weakly correlates with teachers' self-efficacy for two teacher categories (teachers in rural areas and experienced teachers), and no correlation was found for the other teacher categories (teachers in urban areas, elementary school teachers, senior high school teachers, and inexperienced teachers). This finding infers that the cost of the data plan does not really affect teachers' self-efficacy in teaching an online class. One possible explanation for this finding is the government distribution of free internet data plan to all Indonesian students during the Covid-19 pandemic. Thus, teachers expect students to have free, adequate internet data to participate in online learning.

One source of weakness in this study that could have affected the measurements of student internet access was that the student internet access was reported by the teachers. Further studies need to be carried out in order to validate the correlation between student internet access by distributing a questionnaire to students and teachers' self-efficacy in teaching an online class. The generalizability of the current research results is subject to another limitation, i.e., sample size. Although the total sample size was more than adequate for correlation analysis, when the sample was divided into several categories, the sample sizes were relatively small for some categories, such as teachers in urban schools, junior high school teachers, and inexperienced teachers. Thus, future studies with a larger sample size will provide more convincing results, and more teacher categories can be established.

6 Conclusion

This research has revealed how student internet access correlates to teachers' self-efficacy in teaching online classes. The results show that student internet access correlates to some extent with teachers' self-efficacy in teaching an online class. In general, the correlation was moderate, but the correlations varied when teachers were divided into several categories. The correlation was strong among junior high school teachers and moderate for teachers in urban and rural areas, elementary school teachers, teachers who often taught online, and those who never or rarely taught an online class. However, the correlation was weak among senior high school teaches. In terms of internet access, signal quality correlates more to teachers' self-efficacy than signal quality. Meanwhile, the cost of the data plan does not correlate to teachers' self-efficacy for almost all teacher categories, and when it does, the correlation is mostly weak.

These findings have significant implications for the understanding of how experience in teaching an online class contributes to teacher self-efficacy. A weak correlation

between all internet access constructs and teachers' self-efficacy found in the current study means that student internet access will not negatively impact teachers' self-efficacy in teaching an online class successfully, which contrasts with teachers who rarely or never taught an online class. Thus, training accompanied by hands-on experiences of teaching an online class is required to make teachers familiar with this teaching mode, which makes them familiar with student problems related to internet access. In training, teachers can help one another address such problems, and only when a better solution can be offered does the training instructor interfere. Based on the result of this study, this type of experience will warrant better self-efficacy for teachers in teaching and online class regardless of their student internet access.

7   Acknowledgment

8   References

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