

## **Teachers' Experiences and Perceptions in Using Interactive Whiteboards in EFL Classrooms**

Sinta Herawati<sup>1</sup>, Hanna Sundari<sup>2</sup>, Suciati<sup>3</sup>

<sup>1,3</sup> Universitas Terbuka Indonesia, Jalan Cabe Raya, Pondok Cabe, Pamulang, Tangerang Selatan

<sup>2</sup> Universitas Indraprasta PGRI, Jl. Nangka Raya No.58 C, RW.5, Tj. Bar., Kec. Jagakarsa, Kota Jakarta Selatan, Daerah Khusus Ibukota Jakarta  
sintaherawati83@gmail.com

### **Abstract**

Technological development is constantly advancing and keeps taking a bigger role in society, including in education. This development has taken interactive whiteboards to be used in the elementary classroom setting at present. The use of interactive whiteboards correctly can support the teaching-learning process in classrooms. This study was conducted to explore how teachers use the interactive whiteboard in the classrooms, what are the challenges encountered by teachers in teaching English using the interactive whiteboards, and what strategies teachers apply in overcoming those challenges. The study also investigated the teachers' perception of interactive whiteboards. The research method used in this study is qualitative descriptive research involving four English teachers, students of grades one until six, also the principal of an elementary school. The data were obtained through observations, teachers' questionnaires, a principal interview, and students' survey. The technique for analyzing data was data condensation, data display, and conclusion drawing or verification. The study's results showed that teachers used interactive whiteboards to access educational software, such as the ones from the book publisher, Class Dojo, Edunav, and YouTube. Teachers also used interactive whiteboards as projectors to open the slides or presentations made by teachers, such as in PowerPoint, Ms. Word, and flipcharts. The main impacts of the lessons were increased use of the Internet, software, and visual resources as part of the lessons. There are some challenges during the implementation of interactive whiteboards in the classrooms, but teachers could apply some strategies to overcome them. The teachers and students perceived positively the use of interactive whiteboards in the classrooms. Teachers also had positive perceptions in terms of developing lessons using IWB, resources from the internet, and technical support. The negative responses were related to time, collaboration, and professional development.

**Keywords** : interactive whiteboard, experiences, perceptions, challenges, strategies, students, teachers, elementary school

### **Abstrak**

Perkembangan teknologi terus maju dan terus mengambil peran yang lebih besar di masyarakat, termasuk di bidang pendidikan. Perkembangan ini telah mengambil papan tulis interaktif untuk digunakan di ruang kelas dasar saat ini. Penggunaan papan tulis interaktif dapat mendukung dengan baik proses belajar mengajar di kelas. Penelitian ini dilakukan untuk mengeksplorasi bagaimana guru menggunakan papan tulis interaktif di kelas, apa tantangan yang dihadapi guru dalam mengajar bahasa Inggris menggunakan papan tulis interaktif, dan strategi apa yang diterapkan guru dalam mengatasi tantangan tersebut. Studi ini juga mempertanyakan persepsi guru tentang papan tulis interaktif. Metode penelitian yang digunakan dalam penelitian ini adalah penelitian deskriptif kualitatif yang melibatkan empat guru bahasa Inggris, siswa kelas satu sampai enam, serta kepala sekolah dasar. Data diperoleh melalui observasi, angket guru, wawancara kepala sekolah, dan survei siswa. Teknik analisis data adalah kondensasi data, display data, dan penarikan kesimpulan atau verifikasi. Hasil studi menunjukkan bahwa guru menggunakan papan tulis interaktif untuk mengakses perangkat lunak pendidikan, seperti dari penerbit buku, Class Dojo, Edunav, dan YouTube. Guru juga menggunakan papan tulis interaktif sebagai proyektor untuk membuka slide atau presentasi yang dibuat oleh guru, seperti pada PowerPoint, Ms. Word, dan flipchart. Dampak utama dari pelajaran ini adalah peningkatan penggunaan internet, perangkat lunak, dan sumber daya visual sebagai bagian dari pelajaran. Ada beberapa tantangan selama penerapan papan tulis interaktif di kelas, namun guru dapat menerapkan beberapa strategi untuk mengatasinya. Para guru dan siswa merasakan positif penggunaan papan tulis interaktif di kelas. Guru juga memiliki persepsi positif dalam hal mengembangkan pembelajaran menggunakan IWB, sumber daya dari internet, dan dukungan teknis. Tanggapan negatif terkait dengan waktu, kolaborasi dan pengembangan profesional.

**Kata kunci:** papan tulis interaktif, pengalaman, persepsi, tantangan, strategi, siswa, guru, sekolah dasar

---

Corresponding author: Sinta Herawati

Email Address: [sintaherawati83@gmail.com](mailto:sintaherawati83@gmail.com) (Jalan Cabe Raya, Pondok Cabe, Pamulang)

Received 28 February 2023, Accepted 7 March 2023, Published 7 March 2023

## **INTRODUCTION**

Technological development is constantly advancing and keeps taking a bigger role in society, including in education. This development has taken interactive whiteboards to be used in the elementary classroom setting at present. An interactive whiteboard (IWB) is a touch-sensitive screen that connects a computer to a digital projector. Through this connection, a person can control computer applications, write notes in digital ink, present lessons, and save all work to be shared later.

The learning environment strengthened with the use of technology is an important key that can motivate students to learn better and accomplish their target language (Altun, 2015). Anggeraini (2018) states that technology positively promotes activities and initiatives for students in the English classroom. Teachers showed that the technology-based instructions in general allow them to give more exposure to students using various resources and more updated instruction as well as being more professional (Al-Saleem & Issa, 2012).

IWBs can have many positive effects on teaching and learning in general such as increasing students' involvement and engagement as well as bringing positive outlooks both to teachers and students (Danielle Powers, 2011). IWB supports different learning styles. It can be used to adjust the materials for students with a range of abilities, design a better lesson, display the learning material more easily, and give the impression of more updated teachers (Al-Saleem & Issa, 2012). Yang and Teng (2014) stated that useful and ample teaching and learning resources for teachers in integrating IWBs led to changes in pedagogy.

The EFL teachers need to possess appropriate abilities to adopt technologies in teaching to successfully integrate technology use into teaching. This situation requires teachers to have good perceptions of technology use. It puts into account the teachers' beliefs about teaching and technological, pedagogical, and content knowledge, or else known as TPACK (Mishra & Koehler, 2009).

How teachers perceive and experience the integration of IWB in the classroom represents a gap in the literature on teachers' experiences and views of technology in teaching. Moreover, current research on using teaching and learning IWB resources in elementary schools is limited (Samsonova, 2017), especially on the use of IWB in EFL elementary classrooms.

This research is conducted to see how teachers use the interactive whiteboard in EFL classrooms, what challenges they have encountered so far, what strategies they have applied to answer the challenges, and how they perceive the use of IWB in the classrooms. The respondents of the study not only come from the English teachers but also from the principal's and students' points of view. In this case, the knowledge gained from this study might yield new understandings for

teachers in adapting the technology for the teaching and learning process of English. The data also potentially provide information that school administrators can use in their efforts to encourage the use of IWB in the classrooms.

## **METHODS**

This study is classified into qualitative research. It is used to obtain specific information about the values, opinions, behaviors, and social contexts in particular populations. Qualitative research is a type of social science research that collects and works with non-numerical data and that seeks to interpret meaning from these data that help understand social life through the study of targeted populations or places (Crossman, 2020).

The research took place in one of the private Elementary Schools in Tangerang, West Java, Indonesia. The participants are including four English teachers, classes of grades one until six, and the school principal. The data was collected in November 2019.

The data collection techniques in the research were by conducting class observations, handing out teachers' questionnaires, having a students' survey, and also the principal's interview. There were 63 students involved in the survey.

There were 10 observations overall varied based on the teachers and classes they taught. The set of questionnaires was given to obtain detailed and deeper information about the use of IWB by teachers in terms of developing lessons with IWB, collaboration, time, technical problems, school support, professional development, and the use of IWB features in the class. There was also an interview with the principal related to the IWB in school and a students' survey to see how students feel about the use of IWB. Last was the documentation during the observations to make the data more valid.

The researcher transcribed the observation results using the triangulation method and data analysis model by Miles, Huberman, and Saldana. Miles, Huberman, and Saldana (2018) define their qualitative data analysis model into three concurrent flows of activity: 1) data condensation, 2) data display, and 3) conclusion drawing/verification.

The data from the teachers' questionnaires were tallied and then put into tables. As for the students' survey, it was organized and put into diagrams. Information from the principal interview was transcribed and further used to further support the data in answering the research questions.

## **RESULT**

### ***How do teachers use the IWB in EFL classrooms?***

The teachers' experiences in using IWB in EFL classrooms are described based on the results of the observations. There were 10 observations in total with four teachers involved in this research. These observations, later on, are addressed by using the code of Obs1 up to Obs10. The researcher tried to balance the number of observations based on the specific class or grade and teacher. The


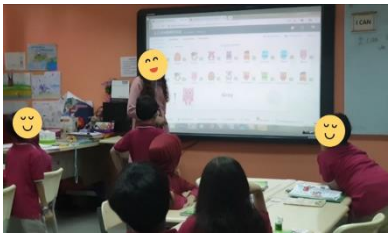
teachers are further addressed as Tch1, Tch2, Tch3, and Tch4. The order of teachers from 1-4 was based on the number of years they have been teaching.

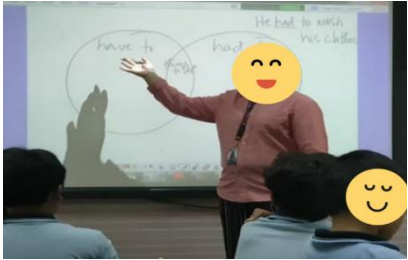


Table 1. Teachers Code

Respondents	Years of Teaching Experience
Teacher 1 (Tch1)	10 years
Teacher 2 (Tch2)	4 years
Teacher 3 (Tch3)	1 and 1/2 years
Teacher 4 (Tch4)	4 months

The researcher coded and made some criteria based on the results of the observations. Those criteria were made according to the similarity of activities/actions and features/ functions used with the IWB in the classroom. There were some activities teachers had in the classrooms during the EFL teaching-learning process. The same activities from each observation were put under the same category. Here are the details:

Table 2. How teachers used the IWB in EFL classrooms during the observations

No.	Features or activities done using the IWB	Percentage	Photo
1.	Teachers opened the digital form or software of the English course book for displaying/presenting materials, playing the recording/audio, and doing/ discussing task	90 %	 <p>The teacher opened the digital book using IWB</p>
2.	Teachers opened the Class Dojo as the school platform for giving points, choosing students randomly in groups or individually for answering questions or doing role play, setting up leaders for the groups setting timers or stopwatches in it for doing tasks/exercises, etc.	70%	 <p>The teacher used Class Dojo during the lesson</p>

No.	Features or activities done using the IWB	Percentage	Photo
3.	Teachers used the flipchart in the IWB and its pen for having a game, displaying/presenting materials or having a discussion on a task or topic delivered in the lessons	70%	 <p>The teacher used IWB to open the flipchart to give an explanation</p>
4.	Teachers used the IWB for checking attendance by opening the Edunav as the school LMS	60%	
5.	Teachers opened the power point from the IWB to play games, do or assign a task to students, display materials and give explanations or have practice with students	50%	
6.	Teachers opened the English interactive software from the book publisher for playing games, stories, or songs according to the units in the book	30%	 <p>The students played an interactive game using IWB</p>
7.	Teachers opened YouTube to find songs or timer	30%	
8.	Teachers used the desktop annotate for presentation/ displaying material, discussion, or doing tasks	20%	 <p>The teacher discussed an exercise together using desktop annotate</p>

Teachers used the IWB ranging from the highest level of usage to the lowest level of usage: To open the educational software of the English books used at school, to open the Class Dojo, to present materials from the IWB flipcharts, to open the Edunav as the school LMS, to present the materials in PowerPoint, to play interactive games, to find materials from YouTube, and to open or use the feature of desktop annotate from IWB.

Most portion of the IWB used by English teachers, as much as 90%, was using IWB to present materials from the digital book of their English main course book. It can be seen from the class observations namely Obs1, Obs2, Obs4, Obs5, Obs6, Obs7, Obs8, Obs9, and Obs10. This result suits the findings of S. Bennet and Lori Lockyer (2008) who stated that teachers integrated the IWBs into their existing teaching practices primarily to support whole-class teaching, especially to present content or model activities.

As much as 70% of the teachers used IWB to open the Class Dojo website. It can be seen namely from Obs1, Obs2, Obs3, Obs5, Obs6, Obs8, and Obs9. The same number goes to the use of flipcharts in the IWB to display or present the materials and have discussions or games. It can be seen from Obs1, Obs2, Obs5, Obs6, Obs8, Obs9, and Obs10. Olga Samsonova (2017) mentioned that teachers use videos, interactive games, educational websites, software, graphics, and images for their lessons in class using IWBs. The main impacts of the lessons were increased use of the Internet, software, and visual resources as part of the lessons.

After that, as much as 60% of the teachers, they had used the IWB for checking attendance by opening the Edunav as the school LMS (Learning Management System). It can be seen from Obs1, Obs2, Obs3, Obs6, Obs8, and Obs9. Below that, as much as 50% of the teachers, had used the IWB to open the PowerPoint to play games, do or assign tasks to students, display materials and give explanations about the topic or have a practice or discussion with the students. It can be seen from Obs5, Obs7, Obs8, Obs9, and Obs10. It is as stated by Bakadam and Asiri (2012) that IWB is an efficient tool to help teachers deliver the teaching materials and provide interaction in the classroom. IWB inspires a highly interactive and engaging teaching approach in the classroom. It helps to reduce the teachers' role in classrooms and improve students' skills in discussion and teamwork (Bidaki & Mobasheri, 2013).

It was as much as 30% of the teachers had used the IWB to open opened the English interactive software from the book publisher for playing games, stories, or songs according to the units in the book. It can be seen from Obs5, Obs8, and Obs9. The technology-based instructions in general allow teachers to give more exposure using various resources and more updated instruction as well as being more professional (Al-Saleem & Issa, 2012).

The same amount also happened for teachers to open YouTube to find songs or timers using the IWB. It can be seen from Obs1, Obs5, and Obs6. As stated by Al-Saleem and Issa (2012), there are three important things about how IWB supports the EFL teaching and learning process in the classrooms. First, it supports interaction and conversation during lessons. Second, it helps with the presentation of new cultural and linguistic elements. Third, it promotes oral skills.

The last, as much as 20% of the teachers had used the IWB to open and use its feature, i.e., the desktop annotate, for having presentations or displaying materials and doing discussions or tasks. It can be seen from Obs1 and Obs5. Miriam White (2018) found that teachers use interactive

technology in their classrooms for presentations and doing interactive activities which support higher-level learning objectives, on a daily or several times a week base.

***The challenges encountered by the teachers in teaching English using the IWB in EFL classrooms***

Teachers faced some challenges in the use of IWB in EFL classrooms. Those challenges were related to lesson creation, resources on the internet to be integrated into the lessons using IWB, time, collaboration, technical problems, school support, and professional development.

The teachers faced some challenges due to the lesson creation such as internet connection, technical problems with the IWB, and time to prepare the lessons. It is as mentioned by some teachers below:

Tch1      “Some technical problems might occur. It needs more time to prepare the lessons by using IWB to make it interesting for the students”

Tch3      “Sometimes the system in IWB is not functioning well. Couldn’t able to access the internet”

Danielle Powers (2011) mentioned a few drawbacks of using or having IWBs such as teachers could not rely on the IWB 100 percent at all times or inconveniences when the technology becomes inaccessible for some time in some aspects like the internet or school file servers go down that make the lessons have to be altered or put on hold until they are restored.

The challenges faced by teachers related to making use of numerous amounts of resources on the internet were the materials were not free-downloaded, the content or size of the materials, time problem, the materials not editable, and teachers who didn’t have the application needed to use or download the materials.

Tch1      “To learn and prepare the lesson using IWB is time-consuming. We also have other works to do such as preparing events, checking students’ work, marking or giving scores, etc.”

This finding suits the study of Corbo (2014) who found that teachers could not create lessons that might aid students in the classroom because of their busy schedules in the classroom. Huang and Xie (2022) also stated that despite EFL teachers are generally aware of the importance of integrating technology for teaching English, they do not have enough time to think about innovative and creative technology use.

Teachers faced some technical problems in the use of IWB. The problems were related to the touch sensitivity, malfunctioning of the IWB, the internet connection that was down, the computer that hung or error, sound, and calibration or sensor parts. Tertemiz et al. (2015) reported that the teacher participants stated how institutional care is needed and immediate technical support is important. This study found that the teachers were satisfied with the help from their school IT though there were times when the technical support or IT staff had a busy schedule that made these problems couldn’t be solved in a fast response. In this case, teachers need to know immediate solutions to how

to solve the IWB problems through professional training, teacher's consultancy, or a call center (Korkmaz & Cakil, 2013).

Time had been teachers' constraint in developing lessons using IWB and doing a collaboration. Olga Samsonova (2017) found that the lack of collaboration in the use of IWB is a big issue for teachers. It is revealed from the study that teachers couldn't create lessons or collaborate with their colleagues using IWB, even though they agreed it was important, because of their busy schedules or having to do other school agendas.

The challenge related to professional development was that teachers never or seldom received professional development or training from the school. It suits the finding of Morrow, Barnhart, and Rooyackers (2002) that professional development has been the most neglected yet actually important factor for integrating the use of technology in literacy instruction. It is known from this study that though the school is able to purchase this expensive classroom technology, it is up to teachers to do self-practice since the school thought that the teachers were millennial generation and literate with new technology, so they could get familiar with the IWBs themselves. These challenges are described in detail in the following table:

No.	Aspects	Challenges or problems
1	Lesson creation	Related to: Internet connections such as no internet connection or unstable signal; Technical problems such as IWB is not functioning; Need more time to prepare interesting lesson
2	Resources in internet to be integrated in the lesson using IWB	Related to the: Content matter; Size of the materials/resources; Not free-downloaded; Time consuming; Not all files were editable; Doesn't have the supported application such as flash, adobe player, etc
3	Time to learn and prepare the lesson using the IWB	Time consuming; Not good in handling technology or lack of proficiency in using IWB, so need help from others; Just know the basic function of IWB
4	Collaboration with other colleagues in the lesson using IWB	Time/schedule conflict; Busy; Nothing to share
5	Technical support	Slow response due to busy schedule
6	Professional development courses/trainings	Training should be regularly done at least once a semester

***The strategies teachers apply in overcoming the challenges of using the IWB in EFL classrooms***

Teachers have applied some strategies to overcome problems or challenges related to the use of IWB in the teaching and learning process of English in the classroom. Regarding the aspect of developing lessons using IWBs for the teaching-learning of English in the classrooms, there were some strategies teachers used such as having some backup plans and saving the materials made before for later use. Dealing with the resources on the internet, teachers did the following strategies: checking the materials first before they downloaded them and asking help from the technician to get the application needed. When teachers couldn't find suitable materials, they would modify the



materials, make their own presentations, find editable materials, or take another resource aside from the internet.

The strategies teachers implemented due to the technical problems were by preparing the device before the lesson started, trying to fix the problem themselves, and informing the school technical support or IT staff to fix it right away. In the meantime, teachers would involve students in doing other productive activities in the classroom or using other tools, such as the glass board.

The strategies teachers used to overcome the time constraints were by having training on how to use features in IWB so teachers could do better in preparing lessons using IWB and finding ready-to-use materials to be modified with IWB to save time. Another way to save time was also by saving the lesson or materials teachers had made before for later use and sharing files with other teachers. As for collaboration, teachers handled the problems related to it by trying to approach their colleagues at any time they were off from the lessons, browsing other teachers' weekly plans so they could integrate the materials for the same lesson or topic, and exploring the IWB themselves. To solve the problem related to the professional development courses, teachers suggested that the school should provide a professional development course or training or seminar to those old users as well as new users, so they could get more proficient in using the IWB. This proficiency will later help in creating interesting lessons for students in learning English and make teachers fully maximize the use of IWB features or functions. Those strategies are further explained in the table below:

No.	Aspects	Strategies applied
1	Lesson creation	Be ready for technical problems; Using other materials such as videos or made-materials and flipcharts that have been saved before
2	Resources in internet to be integrated in the lesson using IWB	Check the materials first before teachers download or use them to be suitable with the class and lesson's objectives; Modify the materials according to the teachers' main course book; Make own presentation; Look for the free-downloaded and editable materials; Find other resources other than from the internet; Get help from the technician to help for the application needed
3	Time to learn and prepare the lesson using the IWB	Joining a training on how to use features in IWB; Finding ready to-use materials to be modified with IWB to save time; Saving lessons or materials teachers had made before for later-use; Share files with other teachers
4	Collaboration with other colleagues in the lesson using IWB	Approaching other colleagues at any time they are off; Browse the weekly program or weekly plan to see other's topic or lesson that week to be integrated to the lesson; Try to explore the IWB themselves
5	Technical support	Informing the school technical support or IT staff to fix it right away; Asking for assistance from the expert that knows more about the technology to handle the problems; Involving students in other productive activities to be done in the classroom; Implementing learning by doing/having the initiative to do self-practice; Exploring more about the use or function of some tools in the IWB; Having the peer training/asking colleagues who are good or the expertise to this technology to teach them more about using the IWB; Practice more or prepare using the IWB well before entering the class
6	Professional development courses/trainings	Suggesting the school to provide a professional development course or training or seminar to those old users as well as new users of IWB

### ***Teachers' perceptions of the use of IWB in classrooms***

Teachers and students received positively the use of IWBs in the classrooms. Teachers had positive perceptions in terms of developing lessons using IWB, resources from the internet, and technical support. The negative responses were related to time, collaboration, and professional development. Teachers perceived the use of IWB in the classroom as positive in terms of developing lessons using IWB, resources from the internet, and technical support. For the technical support, teachers had been positive to the help given by the school technician.

In terms of the lessons, IWB had advantages such as increasing the level of engagement of students, giving convenience and flexibility in learning, and keeping both teachers and students updated with the technology. These results are in line with Hüseyin Öz (2014) who revealed in his study that both Turkish EFL students and teachers have positive perceptions and attitudes towards IWBs and consistently report high levels of enthusiasm for the IWB technology.

This study also pointed out that, based on students' survey, students were satisfied and had positive attitudes toward IWB technology in general. It increased students' attention, and motivation and helped to keep them on task. It is in line with Erbas, Ince, and Kaya (2015) who found that students were motivated to learn materials and engaged with learning tasks when IWBs were used.

Whereas for the resources on the internet, teachers mentioned that IWB allows them to find kinds of materials that could support the lessons' objectives and make the lessons more interesting, engaging, interactive, and enjoyable for the students. Fraser and Garofalo (2015) stated that IWBs improve students' motivation to learn, reinforcing conceptual learning with a visual representation.

The negative responses were related to time, collaboration, and professional development. These findings are in line with Corbo (2014) who mentioned that teachers admitted that they could not create lessons for students due to their busy time schedules and Samsonova (2017) who reported that it is time-consuming for teachers to plan new lessons using IWB. The teachers' perceptions toward the use of IWB are further explained in the following table:

No.	Aspects	Perceptions
1	Lesson creation	Both teachers and students have positive perceptions toward the use of IWB for lesson creation. All teachers stated that IWBs increase the level of engagement of the students, it is a convenient and flexible tools to be used and let both of them keep updated with technology
2	Resources in internet to be integrated in the lessons using IWB	Most teachers have positive perceptions toward the resources in internet to be integrated in the lessons using IWB. They claimed that IWB helped them to find ready-made materials from the internet such as videos or other files to be used or incorporated into the lessons. It is easy to find the materials, just by typing the name of the topic. It is also time-saving where teachers doesn't have to make the materials themselves, just edit or modify the materials to make them more suitable for students.
3	Time to learn and prepare the lessons using the IWB	There are teachers who said neutral and those who said having enough time to learn and prepare lessons using the IWB. It is possible that those teachers who said neutral might find themselves to have enough time to prepare lessons using IWB yet at some other moments, they didn't have enough time to do that.
4	Collaboration with other colleagues in the lessons using IWB	Teachers have common perceptions toward the importance of doing collaboration with other colleagues in the lessons using IWB. They believed that collaboration could improve teachers' skills or ability in using IWB, gain more knowledge by exchanging techniques or information on how to use IWB. Yet, it is contradicted with what happened in the field. There were teachers who said never collaborated with colleagues for lesson creation, and the rest stated seldom and sometimes did collaboration. Those who said never did collaboration, said that they had nothing to share nor time to do it (time/schedule conflict).
5	Technical support	Teachers have positive perception toward the help given by their school IT. It indicated that the technical support did helped teachers dealt with technical problems whenever there were troubles with the IWB.
6	Professional development courses/trainings	There were teachers who had positive responses toward the professional development program and teachers who had negative responses. It happened because of the school held trainings only at the beginning of the IWB implementation. As the time goes on, new teachers didn't get trainings from school, just had some kind of informal learning or peer-learning on how to use the IWB for one or two times.

## CONCLUSION

The study showed that all teachers had used the IWB in their daily teaching and learning activities in the classroom for teaching English. The teachers used the IWBs to access educational software, such as the ones from the book publisher, Class Dojo, Edunav, and YouTube. They also used interactive whiteboards as projectors to open the slides or presentations made by teachers, such as in PowerPoint, Ms.Word, and flipcharts. The main impacts of the lessons were increased use of the Internet, software, and visual resources as part of the lessons.

There are some challenges during the implementation of interactive whiteboards in the classrooms, but teachers could apply some strategies to overcome them. The challenges and strategies applied were related to developing lessons using IWB, time, collaboration, technical problems, school support, and professional development.

The teachers and students perceived positively the use of interactive whiteboards in the classrooms. Teachers also had positive perceptions in terms of developing lessons using IWB, resources from the internet, and technical support. The negative responses were related to time, collaboration, and professional development.

## REFERENCES

- Al-Faki, I. M., & Khamis, A. H. A. (2014). Difficulties facing teachers in using interactive whiteboards in their classes. *American International Journal of Social Science*, 3(2), 136-158.
- Alhababi, H. H. (2017). Technological pedagogical content knowledge (TPACK) effectiveness on English teachers and students in Saudi Arabia. University of Northern Colorado.

- Al-Saleem, B. I. A., & Issa, B. (2012). The interactive whiteboard in English as a foreign language (EFL) classroom. *European Scientific Journal*, 8(3), 126-134.
- Altun, M. (2015). The integration of technology into foreign language teaching. *International Journal on New Trends in Education and Their Implications*, 6(1), 29-34.
- Al-Qirim, N. (2012). Adoption vs. usage of interactive white board technology by teachers in higher education institutions.
- Amin, F. M., & Sundari, H. (2020). EFL students' preferences on digital platforms during emergency remote teaching: Video Conference, LMS, or Messenger Application? *Studies in English Language and Education*, 7(2), 362-378.
- Anggeraini, Y. (2018). Interactive teaching: activities and the use of technology in EFL classroom. *Language Circle: Journal of Language and Literature*, 13(1).
- Atmojo, A. E. P., & Nugroho, A. (2020). EFL classes must go online! Teaching activities and challenges during COVID-19 pandemic in Indonesia. *Register Journal*, 13(1), 49-76.
- Bakadam, E., & Asiri, M. J. S. (2012). Teachers' perceptions regarding the benefits of using the interactive whiteboard (IWB): The case of a Saudi intermediate school. *Procedia-Social and Behavioral Sciences*, 64, 179-185.
- Baytak, A., Tarman, B., & Ayas, C. (2011). Experiencing technology integration in education: children's perceptions. *International Electronic Journal of Elementary Education*, 3(2), 139-151.
- Bennett, S., & Lockyer, L. (2008). A study of teachers' integration of interactive whiteboards into four Australian primary school classrooms. *Learning, Media and Technology*, 33(4), 289-300.
- Bidaki, M. Z., & Mobasheri, N. (2013). Teachers' views of the effects of the interactive white board (IWB) on teaching. *Procedia-Social and Behavioral Sciences*, 83, 140-144.
- Corbo, D. C. (2014). A qualitative study of student and teacher perceptions utilizing interactive whiteboards in middle school classrooms. Northcentral University.
- Crossman, A. (2020). *An Overview of Qualitative Research Methods*. Direct Observation, Interviews, Participation, Immersion, Focus Groups. Thought Co.
- Emeagwali, O. L., & Naghdipour, B. (2013). Exploring the usage and user-perception of interactive white boards in higher education in North Cyprus. *Procedia-Social and Behavioral Sciences*, 83, 272-276.
- Erbas, A. K., Ince, M., & Kaya, S. (2015). Learning mathematics with interactive whiteboards and computer-based graphing utility. *Journal of Educational Technology & Society*, 18(2), 299-312.
- Fraser, V., & Garofalo, J. (2015). Novice mathematics teachers' use of technology to enhance student engagement, questioning, generalization, and conceptual understanding. *Journal of Technology and Teacher Education*, 23(1), 29-51.

- Huang, F., Qi, J., & Xie, A. (2022). Sustaining teaching with technology after the quarantine: Evidence from Chinese EFL teachers' technological, pedagogical and content knowledge. *Sustainability*, 14(14), 8774.
- Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)?. *Contemporary issues in technology and teacher education*, 9(1), 60-70.
- Korkmaz, O., & Cakil, I. (2013). Teachers' difficulties about using smart boards. *Procedia-Social and Behavioral Sciences*, 83, 595-599.
- Liang, Tsung-Ho, Huang, Y. M., & Tsai, C. C. (2012). An investigation of teaching and learning interaction factors for the use of the interactive whiteboard technology. *Journal of Educational Technology & Society*, 15(4), 356-367.
- Maher, D. (2012). Teaching literacy in primary schools using an interactive whole-class technology: Facilitating student-to-student whole-class dialogic interactions. *Technology, Pedagogy and Education*, 21(1), 137-152.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2018). *Qualitative data analysis: A methods sourcebook*. Sage publications.
- Morrow, L. M., Barnhart, S., & Rooyackers, D. (2002). Integrating technology with the teaching of an early literacy course. *The Reading Teacher*, 56(3), 218-230.
- Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language teaching research*, 19(2), 129-132.
- Öz, H. (2014). Teachers' and students' perceptions of interactive whiteboards in the English as a foreign language classroom. *TOJET: The Turkish Online Journal of Educational Technology*, 13(3).
- Powers, D. (2011). *Interactive White Board Use in a Second Grade Classroom During Content Area Lessons* (Doctoral dissertation).
- Rosetti, J. (2012). *Analyzing the perceptions and use of interactive whiteboards by prekindergarten teachers in presentation of classroom lessons* (Doctoral dissertation, Walden University).
- Samsonova, O. (2017). *Understanding elementary teachers' experiences and views using interactive whiteboards for pedagogical practices* (Doctoral dissertation, Walden University).
- Schmid, E. C. (2008). Potential pedagogical benefits and drawbacks of multimedia use in the English language classroom equipped with interactive whiteboard technology. *Computers & Education*, 51(4), 1553-1568.
- Sugiarto, E. (2019). *Menyusun Proposal Penelitian Kualitatif Skripsi Dan Tesis*.
- Tertemiz, N. I., Sahin, D., Can, B., & Duzgun, S. (2015). Views of primary school teachers and students about the interactive whiteboard. *Procedia-Social and Behavioral Sciences*, 186, 1289-1297.
- Türel, Y. K., & Johnson, T. E. (2012). Teachers' belief and use of interactive whiteboards for teaching and learning. *Journal of Educational Technology & Society*, 15(1), 381-394.

White, M. (2018). Effective Use of Interactive Technology in Elementary Classrooms.

Yang, J. Y., & Teng, Y. W. (2014). Perceptions of elementary school teachers and students using interactive whiteboards in English teaching and learning. *Journal of Interactive Learning Research*, 25(1), 125-154.