Synchronous Teaching Classes During the COVID-19 Pandemic: A Narrative Study of Indonesian Science Teacher's Experience

Nabila Tri Ambarwati[1], Susilo[1*]

[1]Departement of Biology Education, Universitas Muhammadiyah Prof. DR. Hamka, Jl. Tanah Merdeka, Kp. Rambutan, Jakarta Timur, Indonesia 13830

*Correspondent email: susilo@uhamka.ac.id

ABSTRACT

Due to the COVID-19 pandemic, Indonesia, like most other countries, has suspended face-to-face learning activities for two semesters. Teachers face the challenge of adapting to a long rotation of online learning. This article narratively investigates the teacher's first experience of changing learning implementation by examining how Synchronous education was implemented in Indonesian schools during the lockdown. We analyzed the tools used, the crucial factors (school support, student engagement, and teacher readiness), and their expectations of leaders during the online learning process. According to the findings, most teachers struggle to determine effective learning strategies due to a lack of technological knowledge. Due to uneven infrastructure support in Indonesia, network issues have become a significant issue. Understanding information and communication technology (ICT) as a teacher is critical for online learning. The ongoing training policy is emphasized to shape teacher development in the future.

Keywords: online learning, professional teacher development, synchronous, training policy

Introduction

For over a year, most schools worldwide have been locking down and transitioning to online (remote) methods due to the COVID-19 pandemic (König, Jäger-Biela, & Glutsch, 2020; Murphy, 2020). UNESCO reports the learning activities of more than 1.5 billion students from 165 countries affected by the pandemic (Osman, 2020). In both synchronous and asynchronous, online learning in Hong Kong is conducted for an entire semester in spring (Moorhouse, 2020). In Australia, school closures are in place from March 24, 2020 (Scull, Phillips, Sharma, & Garnier, 2020) and diverted to hybrid schooling. Similarly, in Indonesia, the lockdown policy makes education providers change their learning system (Purwanto et al., 2020). Teachers face significant new challenges in adapting to online learning (König et al., 2020).

Due to the influence of the Coronavirus pandemic situation since the beginning of 2020, distance learning has become a dominating and exciting research topic for research (Clark, Nong, Zhu, & Zhu, 2020; König et al., 2020). Many studies support the application and development of online learning. The online learning model provides more educational opportunities for all students (Abuhammad, 2020; Aldosemani, 2020). The survey results show that students are generally satisfied with the online learning experience (Jogezai et al., 2021; Osman, 2020; Scull et al., 2020). The implementation is very familiar with observation activities and laboratory-based experiments in science learning. Integrating science learning with real-world information-based and communication technology keeps students motivated and confident (Braund & Reiss, 2006). Dyrberg et al. (2017) explain that the utilization of Labster virtual laboratories can realize interactive learning and increase the confidence and pre-laboratory readiness of students majoring in pharmaceutical toxicology. Other applications such as Edmodo are also proven to increase the participation of secondary school students in biology learning (Permana & Chamisijatin, 2019).

In fact, not all online learning operations are successful (Shi, Tong, & Long, 2021). Although student participation is high, they are less motivated if they are not directly involved in the learning process. (Dyrberg et al., 2017). On the other hand, Teachers struggle to balance cognitive, psychomotor, and affective aspects of synchronous and

asynchronous learning. In practice, synchronous learning allows teachers and students to collaborate on material resources such as text, video, web browsing, and digital whiteboards. A synchronous environment will enable students and teachers to collaborate in virtual classrooms without geographical barriers. Synchronous environments have long been used in learning due to their ease and flexibility (A. N. Chen, Wang, Chen, & Wang, 2008; N.-S. Chen & Ko, 2010; Shahabadi & Uplane, 2015; Wang, Chen, & Levy, 2010). Synchronous activities resemble face-to-face in physical classrooms but require complex learning activities due to their complexity (Meskill & Anthony, 2014). While synchronous classes provide advanced virtual face-to-face features, we believe they have drawbacks.

Evidence of both the positive and negative effects of online learning on teachers and students has been reported across various subjects and regions. Otherwise, the results have been inconsistent and varied, indicating that more research is needed in this area. As far as we know, there has been little coverage of an in-depth investigation of science teachers' experiences with implementing online learning in Indonesia. This study discusses how high school science teachers in Indonesia perceive after teaching in a synchronous environment for a year due to the COVID-19 pandemic. The findings of this study are expected to be used as a consideration by high education system developers and policymakers in countries experiencing similar problems.

Literature Review
Online Mode Learning Transformation

The teaching and learning process is generally a group of students gathered in a classroom according to the schedule and listening to formal explanations from the teacher. In these circumstances, the use of ICT can still be limited (Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014; Weiser, Blau, & Eshet-Alkalai, 2018). On the other hand, some countries have also implemented adaptation to the online mode of learning. They apply blended learning to support the face-to-face process and mediate students' involvement in learning activities (Bower, Dalgarno, Kennedy, Lee, & Kenney, 2015; Ferdiansyah, Supiastutik, & Angin, 2020). Recently, the transition from learning activities to virtual happened unexpectedly quickly and significantly impacted. Of course, this has a positive influence on the development of the

education system, expanding ICT transformation (McFarlane, 2019). Nowadays, ICT integrated curriculum is a concern for the international education system. The need to prepare students in societies where digital literacy plays an essential role in life is becoming increasingly high (König et al., 2020).

The lockdown policy forces teachers and students to turn to online learning, providing a different experience. According to research, most students are quite capable of engaging in digital-based learning. In contrast, competency development in teachers runs slower (Aslan & Zhu, 2015). Outside of instructional purposes, teachers are also asked to maintain communication with students. This encourages teachers to utilize various tools and resources to implement new approaches to teaching and improve digitalization by institutions. This unique situation makes the characteristics gained from regular teacher professionalization programs less applicable. Therefore, training teachers to apply technology in teaching is required (Amhag, Hellström, & Stigmar, 2019; Zydney, Warner, & Angelone, 2020). The determining factor of teacher professionalism in combining technology in learning lies in the teacher's perception of technology. Teachers are expected to have an open attitude and are willing to learn to be fully involved in adopting ICT integrated education (Van der Spoel, Noroozi, Schuurink, & van Ginkel, 2020).

Online Learning Gap

The shift in learning in a short time certainly poses challenges for students and teachers. A teacher must be adaptive and remap learning strategies that support students' learning interactions and motivations (Bennett & Lockyer, 2004). In addition, the short transition period also revives the urgency of teacher professionalism in terms of the digitalization of learning that has been the concern of international educational institutions for a long time (Van der Spoel et al., 2020). As Purwanto et al. (2020) state, the current situation encourages teachers to improve their skills in technology. Online learning can also provide a more flexible and adequate time for teachers to complete their tasks. Another statement found that this learning can mediate learners to construct their learning autonomy (De Paepe, Zhu, & Depryck, 2018).

The effectiveness of online learning can be considered through several factors, including methods used, the interaction of educators with students, and assessments conducted (Caskurlu, Richardson, Maeda, & Kozan, 2021; Dyment, Downing, Hill, & Smith, 2018; Kim & Lee, 2011). The availability of technical facilities and how many opportunities teachers have to develop their digital competencies also often show significant influence (Diningrat, Nindya, & Salwa, 2020; König et al., 2020). At least two problem points can be concluded in implementing online learning: activities centered on teachers and gaps in the interaction between teachers and students that are increasingly widespread due to technical constraints (Buchanan, 2019; Moorhouse, 2020). While in Indonesia itself, the real problem is the limitation of infrastructure caused by different geographical conditions, making some areas difficult to reach. Education in isolated areas becomes crucial because it is prone to 'lose' a generation due to learning difficulties during the pandemic (Permana & Chamisijatin, 2019). This means that while the application of online learning is quite promising, the negative impact that arises becomes a challenge that must be sought solutions.

Synchronous Integrated Learning

Education in the digital age often exposes educators and students to complex problems, encouraging a collaborative solution search process. Most of these problems can be solved by applying technology in pedagogy that eventually improves educational prospects (N. S. Chen, Ko, Kinshuk, & Lin, 2005). Today, interactions are no longer limited to face-to-face meetings but can be done online, the most critical learning component. As reported by Anderson (2003); and Bernard et al. (2009) that there are three types of interactions in education, namely interactions: (1) student-instructors, (2) between students, and (3) student-content materials. Online interaction modes can be categorized into asynchronous and synchronous. Asynchronous learning allows interactions at different times, with media correspondence and written discussions. At the same time, synchronous learning requires both parties to interact directly (real-time) in the teaching and learning process through video conferencing or chat rooms (N. S. Chen et al., 2005; Stewart, Harlow, & DeBacco, 2011).

The increasingly prevalent online learning application aligns with the many studies that uncover the topic and its benefits. Integrated synchronous learning can provide broader educational access and a more inclusive learning experience for geographically isolated students (Bower et al., 2015; Cunningham, 2014). This method also allows students to experience instructional learning by discussing and comment on classroom dialogues similar to conventional learning experiences (Bower et al., 2015; Stewart et al., 2011; White, Ramirez, Smith, & Plonowski, 2010). Video conferencing, commonly used in synchronous learning, can overcome communication challenges and affective assessments, as its interactions can show dynamic body language and discussion rather than reflective written responses (Stewart et al., 2011).

Despite its potential, there are still challenges and problems in implementing integrated synchronous learning. Technical skills and platform usage adaptation are among the biggest challenges for both instructors and students (Bower et al., 2015; Cunningham, 2014; White et al., 2010). Internet bandwidth should also be noted to ensure smooth communication and not hampered or disconnected. Connectivity difficulties can significantly impact synchronous learning (Vu & Fadde, 2013).

Method

This study adopts a narrative inquiry approach mainly used as a legitimate means of research in social, linguistic, and cultural analysis (Barkhuizen, 2013; Ho, Chow, Chiang, Wong, & Chow, 2019; Mendieta & Barkhuizen, 2020). In education, a narrative approach can describe various phenomena that tell the story of his journey as an educator (Tannehill, 2016; Trahar, 2008). It is the most appropriate means of describing what teachers know, do, and teach in a sociocultural context (Clandinin & Connelly, 1987; Conle, 2001; Golombek & Johnson, 2004).

In the context of online learning, narrative approaches can dig deeper into teachers' experiences and are changing the way they teach (Clandinin, Murphy, Huber, & Orr, 2009; Johnson & Golombek, 2002). The transition from regular learning modes to virtual can bring new experiences and dynamic perceptions to related individuals. In this study, semi-structured interviews were used to obtain information regarding participants' backgrounds, academic

affairs, and views on synchronous learning conducted over two semesters. Discussions in the study allowed researchers to unearth information about participants' activities, experiences, and opinions in their language (Brinkmann & Kvale, 2018).

Participants

The participants are Indonesian science teachers who have used synchronous learning. For its collection, the convenience sampling technique was used. Participants and the college's ethics committee carry out and approve ethical procedures. Protection of participants' privacy to maintain research ethics, the complete identity of participants is disguised as done by (Hammersley & Traianou, 2012). The

purpose of the research is determined before entering any data. Participants were informed that they could only provide information if they agreed to participate in the study.

Furthermore, 47 teachers from various schools filled out an online questionnaire sent via email. Twenty-two people agreed to be interviewed over the phone to explain and confirm their submitted stories. The interview is recorded and then transcripted with the participant's permission. The characteristics gained as a result of the whole vary. When the age range, level of education, and type of online learning platform used are considered, the distribution is pretty even. Table 1 contains a detailed description of the participants' characteristics.

Table 1. Demographics of Participants

Variable		Frequency	Sample Percentage (%)	Modus
Gender	Male (1)	9	19.1	
	Women (2)	38	80.9	2
Age	21-30 year (1)	13	27.7	
	31-40 year (2)	6	12.8	
	41-50 year (3)	19	40.4	3
	51-60 year (4)	9	19.1	
Education Level	Undergraduate (1)	24	51.1	1
	Magister (2)	23	48.9	
Frequently used Platforms	Email (1)	21	14.4	
	Whatsapp (2)	38	26	2
	Facebook (3)	1	0.7	
	Youtube (4)	21	14.4	
	Zoom (5)	26	17.8	
	Schoology (6)	2	1.4	
	Edmodo (7)	4	2.7	
	Quipper (8)	2	1.4	
	Edpuzzle (9)	2	1.4	
	Quizizz (10)	2	1.4	
	Google Form (11)	1	0.7	
	Google Meet (12)	14	9.6	
	Google Classroom (13)	8	5.5	
	Cisco Webex (14)	1	0.7	
	Udemy (15)	2	1.4	
	Padlet (16)	1	0.7	

Instruments

As a result of the COVID-19 pandemic, digital instruments were developed to avoid face-to-face meetings. The online assessment is prepared in two main sections, namely: (1) questions about the specific characteristics of each participant and (2)

several open questions for three categories, namely the condition of activities during synchronous learning, the role of agencies in supporting online learning, and learning expectations after the COVID-19 pandemic. Following up on the survey results from (König et al., 2020) and instrument development from (Jäger-Biela, Kaspar, & König, 2020), this narrative

assessment is focused on the teacher's reaction to this change. Data was gathered on the platforms used, the platform's disadvantages and advantages, and the constraints encountered to get a better picture of synchronous learning. Question items are presented in Table 2. This digital instrument results from modifying the previous research instrument (Ferdiansyah et al., 2020; König et al., 2020; Purwanto et al., 2020).

Table 2. Questionnaire Instruments

Indikator	Item
Learning conditions during the COVID-19 pandemic	1. What are the advantages of the online learning platform you use during the learning process?
	2. What are the obstacles encountered during the online learning process?
	3. During online learning, how is the interaction between educators and students?
	4. How is student participation during the online learning process?
	5. In your view, what are the shortcomings or weaknesses of online learning?
	6. In your view, what are the advantages or advantages of online learning?
The role of the agency as a support for online learning	7. How does your agency support online learning?
Learning expectations after the COVID-19 pandemic	8. What is your view on online learning going forward?
	9. When the COVID-19 pandemic in Indonesia ends, will online learning still be done?
	10. Will current online learning affect the curriculum going forward?

Data Collection and Analysis

The narrative data of the interview results are listened to repeatedly and then copied into a table format for easy identification and classification. To facilitate transcription, the data is classified into 1) the conditions of learning activities during the COVID-19 pandemic; 2) the role of agencies in supporting online learning; 3) learning expectations after the COVID-19 pandemic. Participants were allowed to check the transcript of the interview results (member checking) so that the validity of data (data trustworthiness) and ethics in data construction before entering the analysis stage (Harvey, Robinson, & Welch, 2017).

The qualitative hermeneutic analysis analyzes questionnaire and interview data, including reduction, display, conclusion drawing, and verification. This technique aims to interpret and comprehend the meaning of a narrative text (Hashimov, 2015). The detailed analysis procedure, as stated by (Ferdiansyah et al., 2020; Widodo, 2014), consist of:

1. Re-listen semi-structured interview results with participants to find critical points and keep the study's theme in mind.
2. Create table-formatted transcripts of interview results to aid in the coding and categorizing critical data.
3. Interpret data by interpreting each participant's word and or sentence.
4. Provide transcripts of interview data to data sources, namely participants, to obtain feedback on data interpretation results.

Findings and discussions

This study describes the perception of science teachers in Indonesia towards online learning as a result of the COVID-19 pandemic through three themes of findings, including (1) the conditions faced by science teachers in carrying out online learning; (2) the role of the institution in which science teachers teach to support online learning; and (3) online learning expectations after the COVID-19 pandemic.

Conditions Science Teachers Face in Online Learning

Online learning implemented during the pandemic became a new experience for participants and others involved. Implementing the ideal media is needed, where various online learning platforms are easier to reach Today. According to Li & Ma (2010), ICT-based learning tools can be categorized into two, namely: tutorials (used for direct teaching) and communication media (used for collaborative learning). This pandemic period is an opportunity for teachers to increase attention directed at developing and utilizing online learning media. Based on the interview results, most participants used WhatsApp messaging app for asynchronous learning and Zoom meeting for synchronous learning.

> WhatsApp is a convenient and effective way to reach all my students because it is easily accessible and widely used. Furthermore, the cost of internet data is relatively low. -MS

> The delivery of materials that need face-to-face discussion usually uses Zoom because it is comfortable to use. -AFH

Efforts to use online learning media have been made, but participants and students often complain about the effectiveness and efficiency of online learning that is not maximized due to obstacles from various factors. Here is an excerpt of the interview delivered by the participants.

> I find it difficult to make accurate and authentic assessments of students. Similarly, the preparation of learning media. Probably because of my lack of mastery of technology. -LEN

> The biggest obstacle in this online method is in terms of signal and package data internet. If students run out of non-package data, they cannot follow the learning. -IAR

> Each student's financial limitations are what hinder online learning. Not all students have communication tools (gadgets or smartphones) to learn. -NH

In general, the answer to the question of online learning constraints in this study is similar to that reported by Ferdiansyah et al. (2020), that barriers are dominated by internet connection until it finally impacts the absence and loss of student learning opportunities. Thus, it is recommended for educators to help their students deal with this crisis by providing easier-to-reach learning. One of them is switching to a more cost-effective application that best suits each student group (Raaper & Brown, 2020).

While it is hard to control an entire student, various ways are still being taken to build interaction. Because with the dialogue between teachers and students, the exchange of ideas and opportunities to deepen the understanding of learning materials can be created (Harrison, Harrison, Robinson, & Rawlings, 2018). The response was quite varied; the participants in the interview stated it.

> The important apperception activity to be maximized is saying hello to build personal closeness and enthusiasm for students' learning. Because this all starts with the creativity of educators and stakeholders. -FS

> The materials delivery is done through Zoom and continued with the assignment through WhatsApp groups. Question and answers are usually done in WhatsApp groups or can chat privately. Sometimes I reward students who follow the learning well, such as sending credit/internet quota. -LE

> The interview excerpt indicates a good pattern of interaction between educators and students. Nevertheless, not a few participants also stated that online learning is less interactive.

> The class is quite active at the beginning of synchronous, but the more days, the interaction is only one-way from the teacher to the student only. Many feel saturated with this online learning pattern, so they are no longer enthusiastic about learning. -AJ

> Sometimes it is difficult to communicate due to different student backgrounds. -SA

> Fostering student involvement in synchronous learning situations is a challenge in itself. The feedback from students is so minimal that I think it is necessary to update the learning strategy that is more student-centered. -IAR

According to Diningrat et al. (2020), the focus of the next issue after connectivity issues is the best way to increase student engagement by designing more student-centered learning. The exposure of interview results regarding educators' interactions with students can further investigate how much participation students have in education.

The findings showed that 53.2% of participants rated the students as always active, 31.9% thought only a few students were enthusiastic while the rest more often turned off the camera or sound during synchronous learning. Another 14.9% said most of the students were less active in education. Some argue that satisfied students are financially disadvantaged students. Generally, underprivileged students do not have a conducive learning environment and no complete learning support system (Kim & Lee, 2011; Ray, Bala, Chakraborty, & Dasgupta, 2021; Yu & Webb, 2019). The results were obtained based on the results of the participants' interviews.

> The majority of students in my class are very enthusiastic about synchronous learning. It could be the main factor because students are more familiar with the technology. So they are comfortable with this learning pattern. -NS

> Students' learning spirit goes up and down. Approximately 70% of students are active; the rest are silent and do not even participate. -ANF

> Student participation is less than the maximum because not all students can participate in learning because of carrying capacity limitations. -NH

As is commonly assumed, this online learning experience demonstrates that students' digital skill levels appear to outstrip those of most teachers. Nonetheless, what must be prioritized is developing motivation and a spirit of learning in each individual.

The Role of Agencies to Support the Implementation of Online Learning

Activities in online learning from a teacher's perspective include integrating ICT in online teaching and assessment. Adaptive and optimistic nature in achieving learning objectives in each specific situation is needed to build the competence of educators (König et al., 2020). In addition to each teacher's internal factors, the agency's role is also very influential. Digital literacy is the main prerequisite for educators to teach in online classes, so the need for ICT training organized by institutions instructionally becomes an inevitability (Osman, 2020). Based on the results of interviews with participants, most institutions support the implementation of online learning. Among the practices is to provide quota assistance for teachers and students and always inform the development of online learning, as presented in the following interviews.

> Teachers are prepared for online learning with Google Suite for Education training. This is an efficient implementation as things become more integrated. -WN

> The school appreciates students and teachers in the form of internet quota assistance of Rp100,000/month. -FS

> The agency's support is very satisfactory. We, teachers, are supported by internet quotas and given the flexibility to move in the curriculum so that learning can be flexible. -NH

After nearly a year of online learning, the perception of online education is undeniably established. Various points of view can then be used to evaluate future implementation. As a result, this study delves deeper into teachers' propensity to conduct online learning following the pandemic.

Online Learning Expectations After the COVID-19 Pandemic

Participants' responses can be classified into three groups: expressing full support, notes, and not supporting. The following are the results of interviews with participants who support and are

likely to continue to carry out online learning post-pandemic (44.7%).

> Synchronous learning is a form of adaptation to dynamic and fast-paced science and technology development. Educators are encouraged to improve their competence. -FS

> Can reduce time and distance limits so that learning is more effective and efficient. -AC

> Online learning can be an alternative solution when hands-on learning cannot be done. Students are also excited because technology is significantly related to the daily life of millennials. -IS

As in the following interview excerpt, some participants also supported online learning by accompanying the reason (36.2%).

> Inevitably we have to be ready the learning this online method. Nevertheless, it needs improvement for the future based on the experience that has happened. -AJ

> For the implementation of online classes later, hopefully, the provision of facilities will be further improved. Training is held for teachers not to stutter, and socialization for parents/parents to form cooperation. -NDP

> Online classes can be implemented as regular class supporters according to their proportions and needs. -AEP

> Most likely still implemented but not the main one. The form of learning will be hybrid with offline learning (blended learning). However, face-to-face needs to be done. -TG

On the other hand, 19.1% of participants who disapproved or tended to return to offline learning in full included the following reasons.

> I am still more comfortable with hands-on learning because synchronous methods make it challenging to deliver complex material. When students have difficulty understanding the lesson, feeling saturated and giving up will be easy. -NH

> Many teachers and students are in connection-constrained areas, making it increasingly challenging to access lessons. -SA

In terms of flexibility and adaptability, synchronous learning is a real challenge for education worldwide. The challenge elicited a wide range of responses. Following their firsthand experience with this learning method, participants were asked for their thoughts on its shortcomings and benefits. The following are some of the flaws that have been identified.

> Less supportive for practicum. Moments of firsthand experience become lost, and the further impact of students' competence in working in the laboratory is reduced. -AFH

> There is no psychological touch or emotional interaction with students, especially with passive students becoming increasingly challenging to reach. -NN

> Assessments for affective and psychomotor realms are difficult to ascertain their accuracy. Since we do not know precisely what students are doing, the most important thing is honesty. -SM

Assessment of students' performance and attitudes in an online environment are still obstacles for teachers, especially in practical competencies. Therefore, it is important to look for different types of alternative assessment methods that are more relevant. In addition to the various shortcomings, the transition of this form of learning also has a positive impact. One of them is an agent of change in education, especially for classical institutions that have rejected change (Osman, 2020). Like the following interview excerpt.

> The positive is more encouraged to improve skills in the ICT field. Indirectly also optimize the functionality of gadgets that I have. -ML

> Number one is more flexible. Accessible anywhere, relaxing, and time-saving. -LM

> Getting students' assignments and learning outcomes is easier. -ER

However, the significant proportion of online learning implementation will undoubtedly affect the curriculum in the future. The normalization of emergency distance learning will eventually not only be known as a preventive measure of the pandemic and become an alternative form of education but will be more widely implemented to change the educational landscape (Osman, 2020; Shelley, Murphy, & White, 2013). Reflection of the learning experience over the last ten months needs to be done so that educational institutions are better prepared in the face of the possibility of extension of the emergency online learning period and forms of mixed learning. In line with the statement, participants also expressed views on how this method would affect the curriculum in future interviews.

> ICT integration in the learning process will undoubtedly affect the curriculum in the future. However, the curriculum can not be carried out 100% because it still takes time for adaptation. Often the target of educational achievement is not met. -AFH

> Yes, because information technology affects the learning process. Learning will be able to take place without the attachment of space and time. For example, students can complete assignments and discussions with their teacher through an online class. The flexibility of online learning will affect the content of a curriculum that has been dense and very burdensome for teachers and students. -NN

> The experience felt is suitable as a material to improve online learning later. -AC

Conclusion

This study aimed to investigate science teachers' attitudes toward synchronous learning during the Indonesian lockdown. This is because educators are more aware of potential learning situations and understand the impact of using technology.

Furthermore, educators play a significant role in determining the outcomes of learning activities. As a result, this study focuses on gathering statements related to the conditions experienced by teachers during the synchronous learning process, including its benefits and challenges and the hope for better future implementation. The findings revealed that teachers experienced both the positive and negative aspects of the transition to virtual learning. Synchronous learning provides only intrinsic visual feedback that tends to harm education. Pedagogical protocols are challenging to implement with synchronous learning systems. Therefore, network infrastructure constraints allow speech during learning, as evidenced by previous research (Pagnotta, Laland, & Coco, 2020).

Nevertheless, in the end, it can be concluded that most teachers support the application of hybrid schooling in the learning system in the future, with the record of making some improvements to facilitate adaptation and meet learning achievements. Empirically, this research contributes to considering an ideal online learning application or medium to use. In addition, theoretically, this research states that teachers need training for ICT integrated teaching, especially for science teachers who need to assess aspects of students' practical skills. Another factor that also affects the effectiveness of online learning is the condition of the network. This study has not revealed the extent of the impact of technical constraints on learning outcomes. It is expected that other researchers can compare the percentage of internet access between countries and how it affects the country's educational status. In closing, integrated synchronous learning offers students benefits in terms of flexibility, but technological and pedagogical knowledge challenges challenge implementing this approach.

Disclosure statement
The authors reported no potential conflict of interest.

References
Abuhammad, S. (2020). Barriers to distance learning during the COVID-19 outbreak: A qualitative review from parents' perspective. Heliyon, 6(11), e05482. https://doi.org/10.1016/j.heliyon.2020.e05482

Aldosemani, T. I. (2020). Towards Ethically Responsive Online Education: Variables and

Strategies from Educators' Perspective. Journal of Education and Learning, 9(1), 79. https://doi.org/10.5539/jel.v9n1p79

Amhag, L., Hellström, L., & Stigmar, M. (2019). Teacher Educators' Use of Digital Tools and Needs for Digital Competence in Higher Education. Journal of Digital Learning in Teacher Education, 35(4), 203–220. https://doi.org/10.1080/21532974.2019.164616 9

Anderson, T. (2003). Getting the mix right again: An updated and theoretical rationale for interaction. International Review of Research in Open and Distance Learning, 4(2), 126–141. https://doi.org/10.19173/irrodl.v4i2.149

Aslan, A., & Zhu, C. (2015). Pre-service teachers' perceptions of ICT integration in teacher education in Turkey. Turkish Online Journal of Educational Technology, 2015(3), 462–466.

Barkhuizen, G. (2013). Narrative research in applied linguistics. Cambridge university press.

Bennett, S., & Lockyer, L. (2004). Becoming an online teacher: Adapting to a changed environment for teaching and learning in higher education. Educational Media International, 41(3), 231–248. https://doi.org/10.1080/0952398041000168084 2

Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C. (2009). A meta-analysis of three types of interaction treatments in distance education. Review of Educational Research, 79(3), 1243–1289. https://doi.org/10.3102/0034654309333844

Bower, M., Dalgarno, B., Kennedy, G. E., Lee, M. J. W., & Kenney, J. (2015). Design and implementation factors in blended synchronous learning environments: Outcomes from a cross-case analysis. Computers and Education, 86, 1–17. https://doi.org/10.1016/j.compedu.2015.03.006

Braund, M., & Reiss, M. (2006). Validity and worth in the science curriculum: Learning school science outside the laboratory. Curriculum Journal, 17(3), 213–228. https://doi.org/10.1080/09585170600909662

Brinkmann, S., & Kvale, S. (2018). Doing Interviews (Second). Second. 55 City Road, London. https://doi.org/10.4135/9781529716665

Buchanan, J. J. (2019). Mirror-hand selection is influenced by training perspective and model skill level in a motor-learning task. Experimental Brain Research, 237(2), 417–426. https://doi.org/10.1007/s00221-018-5428-7

Caskurlu, S., Richardson, J. C., Maeda, Y., & Kozan, K. (2021). The qualitative evidence behind the factors impacting online learning experiences as informed by the community of inquiry framework: A thematic synthesis. Computers and Education, 165(July 2020), 104111. https://doi.org/10.1016/j.compedu.2020.10411 1

Chen, A. N., Wang, Y., Chen, N., & Wang, Y. (2008). Testing Principles of Language Learning in a Cyber Face-to-Face Environment. International Forum of Educational Technology & Society, 11(3), 97–113.

Chen, N.-S., & Ko, L. (2010). An Online Synchronous Test for Professional Interpreters. Journal of Educational Technology & Society, 13(2), 153–165. Retrieved from http://www.jstor.org/stable/jeductechsoci.13.2. 153

Chen, N. S., Ko, H. C., Kinshuk, & Lin, T. (2005). A model for synchronous learning using the Internet. Innovations in Education and Teaching International, 42(2), 181–194. https://doi.org/10.1080/14703290500062599

Clandinin, D. J., & Connelly, F. M. (1987). Teachers' personal knowledge: What counts as 'personal'in studies of the personal. In Journal of Curriculum studies (Vol. 19). Taylor & Francis.

Clandinin, D. J., Murphy, M. S., Huber, J., & Orr, A. M. (2009). Negotiating narrative inquiries: Living in a tension-filled midst. The Journal of Educational Research, 103(2), 81–90.

Clark, A. E., Nong, H., Zhu, H., & Zhu, R. (2020). Compensating for academic loss: online learning and student performance during the COVID-19 pandemic. Journal of Education, 1(2), 1–18. https://doi.org/10.1016/j.chieco.2021.101629

Conle, C. (2001). The Rationality of Narrative Inquiry in Research and Professional Development. European Journal of Teacher Education, 24(1), 21–33. https://doi.org/10.1080/02619760120055862

Cunningham, U. (2014). Teaching the Disembodied: Othering and Activity Systems in a Blended Synchronous Learning Situation. International

Review of Research in Open and Distributed Learning. 15(6), 33–51.

De Paepe, L., Zhu, C., & Depryck, K. (2018). Online Dutch L2 learning in adult education: educators' and providers' viewpoints on needs, advantages and disadvantages. Open Learning, 33(1), 18–33. https://doi.org/10.1080/02680513.2017.141458 6

Diningrat, S. W. M., Nindya, M. A., & Salwa. (2020). Emergency online teaching: Early childhood education lecturers' perception of barrier and pedagogical competency. Cakrawala Pendidikan, 39(3), 705–719. https://doi.org/10.21831/cp.v39i3.32304

Dyment, J., Downing, J., Hill, A., & Smith, H. (2018). 'I did think it was a bit strange taking outdoor education online': exploration of initial teacher education students' online learning experiences in a tertiary outdoor education unit. Journal of Adventure Education and Outdoor Learning, 18(1), 70–85. https://doi.org/10.1080/14729679.2017.134132 7

Dyrberg, N. R., Treusch, A. H., & Wiegand, C. (2017). Virtual laboratories in science education: students' motivation and experiences in two tertiary biology courses. Journal of Biological Education, 51(4), 358–374. https://doi.org/10.1080/00219266.2016.125749 8

Ferdiansyah, S., Supiastutik, S., & Angin, R. (2020). Thai Students' Experiences of Online Learning at Indonesian Universities in the Time of the COVID-19 Pandemic. Journal of International Students, 10(S3), 58–74.

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). Preparing for Life in a Digital Age. In Preparing for Life in a Digital Age. https://doi.org/10.1007/978-3-319-14222-7

Golombek, P. R., & Johnson, K. E. (2004). Narrative inquiry as a mediational space: Examining emotional and cognitive dissonance in second-language teachers' development. Teachers and Teaching: Theory and Practice, 10(3), 307–327. https://doi.org/10.1080/1354060042000204388

Hammersley, M., & Traianou, A. (2012). Ethics in Qualitative Research: Controversies and Contexts. London. https://doi.org/10.4135/9781473957619

Harrison, R. A., Harrison, A., Robinson, C., & Rawlings, B. (2018). The experience of international postgraduate students on a distance-learning programme. Distance Education, 39(4), 480–494. https://doi.org/10.1080/01587919.2018.152003 8

Harvey, T., Robinson, C., & Welch, A. (2017). The lived experiences of international students who's family remains at home. Journal of International Students, 7(3), 748–763. https://doi.org/10.5281/zenodo.570031

Hashimov, E. (2015). Qualitative Data Analysis: A Methods Sourcebook and The Coding Manual for Qualitative Researchers. Technical Communication Quarterly, 24(1), 109–112. https://doi.org/10.1080/10572252.2015.975966

Ho, K. H. M., Chow, S. K. Y., Chiang, V. C. L., Wong, J. S. W., & Chow, M. C. M. (2019). The technology implications of master's level education in the professionalization of nursing: A narrative inquiry. Journal of Advanced Nursing, 75(9), 1966–1975. https://doi.org/10.1111/jan.14044

Jäger-Biela, D., Kaspar, K., & König, J. (2020). Opportunities to Learn Digital Media Competences. InEducation, School, Digitalization, 66–72.

Jogezai, N. A., Baloch, F. A., Jaffar, M., Shah, T., Khilji, G. K., & Bashir, S. (2021). Teachers' attitudes towards social media (SM) use in online learning amid the COVID-19 pandemic: the effects of SM use by teachers and religious scholars during physical distancing. Heliyon, 7(4), e06781. https://doi.org/10.1016/j.heliyon.2021.e06781

Johnson, K. E., & Golombek, P. R. (2002). Teachers' narrative inquiry as professional development. Cambridge University Press.

Kim, J., & Lee, W. (2011). Assistance and possibilities: Analysis of learning-related factors affecting the online learning satisfaction of underprivileged students. Computers and Education, 57(4), 2395–2405. https://doi.org/10.1016/j.compedu.2011.05.021

König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany. European Journal of Teacher Education, 43(4), 608–622.

https://doi.org/10.1080/02619768.2020.180965 0

Li, Q., & Ma, X. (2010). A meta-analysis of the effects of computer technology on school students' mathematics learning. Educational Psychology Review, 22(3), 215–243. https://doi.org/10.1007/s10648-010-9125-8

Mendieta, J., & Barkhuizen, G. (2020). Blended language learning in the Colombian context: a narrative inquiry of teacher ownership of curriculum change. Computer Assisted Language Learning, 33(3), 176–196. https://doi.org/10.1080/09588221.2018.155388 8

Meskill, C., & Anthony, N. (2014). Managing synchronous polyfocality in new media/new learning: Online language educators' instructional strategies. System, 42(1), 177–188.
https://doi.org/10.1016/j.system.2013.11.005

Moorhouse, B. L. (2020). Adaptations to a face-to-face initial teacher education course 'forced' online due to the COVID-19 pandemic. Journal of Education for Teaching, 00(00), 1–3. https://doi.org/10.1080/02607476.2020.175520 5

Murphy, M. P. A. (2020). COVID-19 and emergency eLearning: Consequences of the securitization of higher education for post-pandemic pedagogy. Contemporary Security Policy, 41(3), 492–505. https://doi.org/10.1080/13523260.2020.176174 9

Osman, M. E. T. (2020). Global impact of COVID-19 on education systems: the emergency remote teaching at Sultan Qaboos University. Journal of Education for Teaching, 46(4), 463–471. https://doi.org/10.1080/02607476.2020.180258 3

Pagnotta, M., Laland, K. N., & Coco, M. I. (2020). Attentional coordination in demonstrator-observer dyads facilitates learning and predicts performance in a novel manual task. Cognition, 201(April), 104314. https://doi.org/10.1016/j.cognition.2020.10431 4

Permana, F. H., & Chamisijatin, L. (2019). Edmodo as a solution to enhance student learning interest in high school biodiversity during the COVID-19 pandemic. Biosfer: Jurnal Pendidikan Biologi, 12(1), 58–69.

Purwanto, A., Asbari, M., Fahlevi, M., Mufid, A., Agistiawati, E., Cahyono, Y., & Suryani, P. (2020). Impact of Work From Home (WFH) on Indonesian Teachers Performance During the Covid-19 Pandemic : An Exploratory Study. International Journal of Advanced Science and Technology, 29(5), 6235–6244.

Raaper, R., & Brown, C. (2020). The Covid-19 pandemic and the dissolution of the university campus: implications for student support practice. Journal of Professional Capital and Community, 5(3–4), 343–349. https://doi.org/10.1108/JPCC-06-2020-0032

Ray, A., Bala, P. K., Chakraborty, S., & Dasgupta, S. A. (2021). Exploring the impact of different factors on brand equity and intention to take up online courses from e-Learning platforms. Journal of Retailing and Consumer Services, 59(March 2020), 102351. https://doi.org/10.1016/j.jretconser.2020.10235 1

Scull, J., Phillips, M., Sharma, U., & Garnier, K. (2020). Innovations in teacher education at the time of COVID19: an Australian perspective. Journal of Education for Teaching, 46(4), 497–506. https://doi.org/10.1080/02607476.2020.180270 1

Shahabadi, M. M., & Uplane, M. (2015). Synchronous and Asynchronous e-learning Styles and Academic Performance of e-learners. Procedia - Social and Behavioral Sciences, 176, 129–138.
https://doi.org/10.1016/j.sbspro.2015.01.453

Shelley, M., Murphy, L., & White, C. J. (2013). Language teacher development in a narrative frame: The transition from classroom to distance and blended settings. System, 41(3), 560–574.
https://doi.org/https://doi.org/10.1016/j.system. 2013.06.002

Shi, Y., Tong, M., & Long, T. (2021). Investigating relationships among blended synchronous learning environments, students' motivation, and cognitive engagement: A mix-method study. Computers & Education, 104193. https://doi.org/https://doi.org/10.1016/j.comped u.2021.104193

Stewart, A. R., Harlow, D. B., & DeBacco, K. (2011). Students' experience of synchronous learning in distributed environments. Distance Education,

32(3), 357–381. https://doi.org/10.1080/01587919.2011.610289

Tannehill, D. (2016). My journey to become a teacher educator. Physical Education and Sport Pedagogy, 21(1), 105–120. https://doi.org/10.1080/17408989.2014.898745

Trahar, S. (2008). Using narrative inquiry as a research method: an introduction to using critical event narrative analysis in research on learning and teaching, by Leonard Webster, and Patricie Mertova. Compare: A Journal of Comparative and International Education, 38(3), 367–368. https://doi.org/10.1080/03057920802112933

Van der Spoel, I., Noroozi, O., Schuurink, E., & van Ginkel, S. (2020). Teachers' online teaching expectations and experiences during the Covid19-pandemic in the Netherlands. European Journal of Teacher Education, 43(4), 623–638. https://doi.org/10.1080/02619768.2020.1821185

Vu, P., & Fadde, P. J. (2013). When to talk, when to chat: Student interactions in live virtual classrooms. Journal of Interactive Online Learning, 12(2), 41–52.

Wang, Y., Chen, N. S., & Levy, M. (2010). The design and implementation of a holistic training model for language teacher education in a cyber face-to-face learning environment. Computers and Education, 55(2), 777–788. https://doi.org/10.1016/j.compedu.2010.03.010

Weiser, O., Blau, I., & Eshet-Alkalai, Y. (2018). How do medium naturalness, teaching-learning interactions and Students' personality traits affect participation in synchronous E-learning? Internet and Higher Education, 37(January), 40–51. https://doi.org/10.1016/j.iheduc.2018.01.001

White, C. P., Ramirez, R., Smith, J. G., & Plonowski, L. (2010). Simultaneous delivery of a face-to-face course to on-campus and remote off-campus students. TechTrends, 54(4), 34–40. https://doi.org/10.1007/s11528-010-0418-z

Widodo, H. P. (2014). Methodological Considerations in Interview. International Journal of Innovation in English Language, 3(1), 101–107.

Yogesh Hole et al 2019 J. Phys.: Conf. Ser. 1362 012121

Yu, H., & Webb, G. I. (2019). Adaptive online extreme learning machine by regulating forgetting factor by concept drift map. Neurocomputing, 343, 141–153. https://doi.org/10.1016/j.neucom.2018.11.098

Zydney, J. M., Warner, Z., & Angelone, L. (2020). Learning through experience: Using design based research to redesign protocols for blended synchronous learning environments. Computers and Education, 143(August 2019), 103678. https://doi.org/10.1016/j.compedu.2019.103678